



وزارة التعليم العالي والبحث العلمي
جهاز الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي
قسم الاعتماد

دليل وصف البرنامج الأكاديمي والمقرر

الدراسي

قسم التقنيات الكهربائية

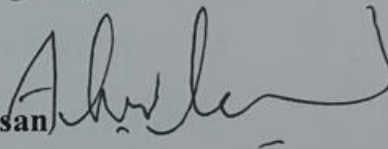
Ministry of Higher Education and Scientific Research
Scientific Supervision and Evaluation Authority
Quality Assurance and Academic Accreditation Department

Academic Program Description Form for Colleges and Institutes

University: Al-Furat Al-Wusta Technical University
Rumaytha Technical Institute
Scientific Department: Electrical Engineering Department
Date the file was filled out: 10/15/2025

Signature:

Scientific Assistant Name: Dr. Ahmed Razzaq Hassan
Date: 2026/5/20



Signature:



Name of Department Head: Mr. Amjad H. Hamzaw y
Date: 2026/5/20

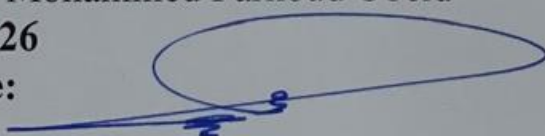
The file was reviewed by :

University Quality Assurance and Performance Division

Name of the Director of the Quality Assurance and University Performance
Division: Mr. Mohammed Farhoud Obeid

Date: 20/5/2026

The signature:



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Approval of the Dean

1. Program Vision

The department aims to graduate a technical and engineering staff capable of .work electrical performing

2. Program message

The department adopts the dissemination of scientific and technical knowledge in the field of electrical engineering sciences to graduate national cadres with a level of education that enables them to absorb modern technologies and support the scientific and technological development process to keep pace with global developments and : fulfill the following

1. Using computer and internet technologies in education and training
2. ‘ Opening up to the community in the field of mechanical industries and equipment ,and activating the relationship with the private sector in the field of industry, training .and technical qualification
3. Developing future plans for improving educational and training curricula and .graduating technical personnel in the field of electricity
4. Focusing on scientific research between academics in the department and industrial .staff to solve electrical energy problems and develop its production

3. Program objectives

1- Preparing qualified technical personnel in the field of electricity, scientifically and practically qualified to carry out the operation and maintenance of electrical units in power generation, transmission and distribution stations, as well as the maintenance of .devices and equipment in the department and institute facilities

2 Building and preparing the student psychologically to fulfill his role in the field of .electrical engineering

3 Developing curricula to suit the labor market and providing quality services to the community by developing relationships with private and governmental sector departments.

4. Program accreditation

ABET

5. Other external influences

Labor market and private sector

6. Program Structure

Notes	Percentage	Online Study	Number of courses	Program structure
	%4.7	6	3	Institutional requirements
	%20.6	26	6	College/Institute Requirements
	%74.6	94	13	Department requirements
			Two months equivalent academic year	Summer training

*The notes may include whether the course is core or elective.

Credit Hours			Course name	Year / Level
the total	practical	theoretical		
4	2	2	Electrical circuits and measurements	First
4	2	2	Electrical installations	First
4	2	2	Electronics	First
6	6	-	Factors	First
2	-	2	mathematics	First

2	—	1	Computer applications	First
3	3	-	Engineering and electrical drawing	First
1	-	1	Human rights and democracy	First
2	-	2	Occupational safety	First
4	2	2	Digital electronics	First
1	-	1	Arabic	First
1	-	1	English language	First
5	3	2	electrical machines	Second
4	2	2	electrical networks	Second
5	3	2	Power Electronics	Second
4	4	-	Maintenance Workshop	Second
4	2	2	Electrical installations	Second
2	-	1	Computer applications	Second
3	3	-	electrical drawing	Second
3	2	1	Programmable Logic Controller (PLC)	Second
2	2	-	Project	Second
1	-	1	English language	Second
1	-	1	Arabic	Second
1	-	1	Ba'ath Party crimes in Iraq	Second

8. Expected learning outcomes of the program

Knowledge

- 1- To explain and teach the student the basics of electrical theories and circuit analysis.
- A2 - Ability to operate and maintain Electrical units in power plants.
- A3 - Ability to lay and maintain cables ground, and air

	A4 - Mapping ability Electrical engineering using computer .simulation of electrical circuits
Skills	
	B-1 The student's ability to implement and maintain home electrical networks and industrial
	B-2 Equipping the student with the skill of diagnosing electrical faults and solving problems The process in electrical networks
	B3 - The ability to carry out electrical installations for houses and .residential buildings
	B4 - The ability to use a computer for the purpose of simulating . electrical circuits
Values	
	C-1 Equipping students with practical skills in laboratories and workshops
	C-2 Equipping students with the ability to think in solving practical problems
	C-3 Guiding students to care for and preserve the property of the department and the institute
	C-4 Developing students' internet research skills

9. Teaching and learning strategies

- 1– Using modern methods in teaching and training students.
- 2– Forming discussion groups during lectures to discuss study topics.
- 3–Assigning extracurricular duties to students.

10. Evaluation methods.

- 1– Daily exams
- 2– Monthly and final exams
- 3– Extracurricular assignments and weekly laboratory reports

Academic program description:

prepare technical staff in the field of The Department of Electrical Technologies aims to electrical power who are capable of meeting the needs of the labor market in state institutions and the private sector in the fields of industry, construction and reconstruction, and to

prepare an educated generation that is armed with science and adopts it as a sound basis for making radical changes and puts scientific knowledge and the scientific method in thinking and analysis in the service of the country's goals and adapting to the development .of technologies in order to keep pace with the expansion of human needs

Al-Rumaytha Technical Institute - Al-Furat University Middle Technical University	1. Educational institution
Electrical Engineering Department	2. Scientific Department Center /
Electrical technologies – electrical power	3. or professional program
Technical Diploma – Electrical Power	4. Name of final certificate
annual	5. : Study system / Annual / Courses Other
ABET	6. Accredited Accreditation Program
There is no	7. Other external influences
2025/10/15	8. Date of preparation of description
9. : <u>Academic Program Objectives</u>	
1– Preparing technical staff in the field of electrical power capable of meeting the needs of the labor market in state institutions and the private sector in the fields of industry, construction and reconstruction, and preparing an educated generation armed with science and adopting it as a sound basis for bringing about radical changes and putting scientific knowledge and the scientific method of thinking and analysis in the service of the country's goals and adapting to the .development of technologies in order to keep pace with the expansion of human needs	
2– Striving to produce intermediate technical personnel in the field of electrical engineering who have the ability to be creative and innovative and to keep pace with the scientific and .technological developments taking place in the field of different electrical systems	

3– Focusing on students and emphasizing building them on strong foundations of scientific knowledge (theoretical and practical) in the field of electrical power, and constantly striving to support them in various fields to make them able to solve the problems that they may face in various situations, and thus provide quality services to society, because higher education has a fundamental role in building and developing societies by preparing young cadres who are .able to choose the best means to expand their activities and develop their scientific capabilities

4– Balancing the focus on theoretical and applied electrical engineering principles, and equipping .students with analytical and laboratory tools and computer systems that enable them to identify formulate, and solve technical problems. Emphasis is placed on incorporating modern teaching methods that enhance students' creativity and innovation , while also providing opportunities for self-directed learning in the future. Furthermore, continuing education is provided to the community through courses, workshops, seminars, and consultations to address challenges .faced by the community in the electrical industries

10.program's required outputs , teaching and learning methods, and assessment:

İ- :Cognitive objectives

It is possible –A1 For students Get Knowledge And they and principles and theories and the basics in area Technologies electrical in addition to Mathematics and equations and algorithms . Essential for solving and simplifying electrical circuits

It is possible –A2 For students from to understand Topics Scientific The modern Advanced and computer software Which is used in the field of analysis, design and problem-solving for electrical systems and the foundations of their theoretical .applications

A3– Be knowledgeable about global electrical technology standards and systems , estimate market needs , apply quality management concepts in the labor market , and prepare . electrical plans

A4– Adherence to the ethics of practicing the profession and the ability to demonstrate high professional competence while committing to occupational safety requirements and .preserving the environment

B - The program's specific skill-based objectives are

B1– The ability to apply electrical engineering techniques In the various components of electrical systems and devices, taking into account international standards and regulations in .this field

B2– Analyzing and the ability to suggest technical problems and finding solutions to them suitable alternatives.

B3– To equip the student with the skills to use computer applications, digital electronic circuits, and logic control circuits in the field of analysis, design, control devices, and preparing diagrams for electrical systems.

B4– Equipping the student with the skills to maintain and repair electrical appliances in the labor market.

Teaching and learning methods:

1-Theoretical lectures

2–Practical lectures in laboratories and workshops

3–Discussion and dialogue during lectures

4–Scientific field visits to work sites

5–Graduation projects for graduating students and their discussion

6–Discussion sessions on specific topics

7– Supporting theoretical and practical lectures using computers and information available via the Internet

Evaluation methods:

1-Midterm and final exams

2– Quick tests(Quizzes)

3–Writing scientific reports

4–Continuous evaluation

5–Scientific discussion

6–Homework

7–Graduation project discussion committees for graduating students

C- Affective and value-based objectives:

C1–Encouraging the development of students’ professional and technical thinking

C2 Working to develop a distinctive student personality by developing cultural, social and technical awareness that qualifies him after graduation to contribute effectively to serving his community.

C3– The ability to make decisions by identifying and organizing available information to determine the technical problem and find solutions.

C4– The ability to understand scientific theories and the principles upon whichb asedThis helps develop the student's scientific thinking.

: Teaching and learning methods

1- Theoretical lectures

2–Direct and open scientific discussion lectures for instructors with students.

3–Practical application of lectures in laboratories related to the subject matter

4–Student discussion groups address specific technical problems.

5– Analyzing technical problems by the teaching and technical staff with the participation the students.

Evaluation methods:

1–The student's interaction with the lecture and classroom discussions.

2–Scientific discussion

3–Continuous student assessment

4– ‘The student’s daily attendance at theoretical lectures, practical applicationsandsessions .

5– Tests that determine the student's ability to interpret the available dataand analyze/solve the technical problem.

D - General and transferable skills (other skills related to employability and personal development) :

D 1– Basic skills in the maintenance and repair of electrical equipment and the analysis of electrical circuits.

D2– Teaching the student how to develop and enhance creative and innovative thinking skills in the field of electrical technologies.

D3–Enabling students to pass professional tests organized by employers.

D4–Enabling students to engage in continuous self–development after graduation .

: Teaching and learning methods

1-Curricula

2–Classroom activities, extracurricular and home–based activities .

3–Graduation projects.

4–Questionnaires to find out the students’ opinions and desires regarding various activities.

5–Using the World Wide Web (the Internet) .

Evaluation methods :

1–Theoretical lectures.

2–Practical application of lectures in laboratories related to the subject matter .

3–Continuous follow–up by the educational advisor for the students of each study group.

4–Conducting research and working papers.

5– Analyzing technical problems by the teaching and technical staff with the participation of the students.

6–Graduation research discussion committees for graduating students.

7–Continuous follow–up from graduation project supervisors for group students.

8–Personal interviews for students.

11. Program structure:

Number of units	Number of credit hours weekly		Course name	Course code	Academic stage
	practical	theoretical			
8	2	2	Electrical circuits and measurements	RELEC1001	
8	2	2	Electrical installations	RELEC1002	

8	2	2	Electronics	RELEC1003	First
12	6	-	Factors	RELEC1004	
4	-	2	mathematics	RELEC1005	
2	-	1	Computer applications	RELEC1006	
6	3	-	Engineering and electrical drawing	RELEC1007	
2	-	1	Human rights and democracy	RELEC1008	
2	-	2	Occupational safety	RELEC1109	
4	2	2	Digital electronics	RELEC1210	
1	-	1	Arabic	RELEC1211	
1	-	1	English language	RELEC1212	
10	3	2	electrical machines	RELEC2001	Second
8	2	2	electrical networks	RELEC2002	
10	3	2	Power electronics	RELEC2003	
8	4	-	Maintenance Workshop	RELEC2004	
8	2	2	Industrial establishments	RELEC2005	
2	-	1	Computer applications	RELEC2006	
4	2	-	Project	RELEC2007	
3	3	-	electrical drawing	RELEC2108	
3	2	1	Programmable Logic) ControllerPLC (	RELEC2209	
1	-	1	Arabic	RELEC2210	
1	-	1	English language	RELEC2211	

12. Planning for personal development:

The Electrical Engineering Department seeks to improve the scientific and administrative process and overcome all difficulties and obstacles that hinder the educational program by developing human resources to develop the personality by following the following procedures:

1. Continuous improvement and development of faculty members and training through training programs and workshops inside and outside the department.
2. Urging and encouraging faculty members to obtain the highest academic and administrative ranks.
3. Encouraging and supporting faculty members with master's degrees to complete their studies and obtain higher degrees.
4. The aim is to provide modern scientific sources and books to keep pace with the rapid progress in technical and engineering sciences.
5. Providing specialized software in the field of electrical technologies and the necessary computer equipment, along with internet access for all instructors.
6. Increasing extracurricular activities such as organizing and participating in conferences, scientific seminars, and sports festivals.

13. Admission criteria (establishing regulations related to enrollment in the college or institute):

1. According to the regulations and conditions specified by the Ministry of Global Education through central admission.
2. The student's desire to study in the department is for preparatory school students accepted into the technological departments of the institute, according to their grades.
3. The department's capacity.

14. Key sources of information about the program:

- 1. The curriculum approved by the Ministry of Higher Education and Scientific Research and its guiding manuals.**
- 2. Courses in teaching methods.**
- 3. Internet research on similar experiments.**
- 4. Personal experiences.**

Curriculum Skills Outline

Please check the boxes corresponding to the individual learning outcomes from the program that are being assessed.

Learning outcomes required from the program

General and transferable skills) other skills related to employability and personal development)				Affective and value-based objectives				- Program specific skills objectives				Cognitive objectives				essentia l My choice	Course Name	Course code	/ Year Level
D4	D3	D2	D1	Q 4	Pa rt 3	Pa rt 2	Pa rt 1	B4	B3	B2	B1	A4	A3	A2	A1				
	√	√		√			√			√	√				√	essentia l	Electrical circuits and measurements	RELEC1001	First year
√	√	√		√	√		√			√	√		√		√	essentia l	Electrical installations	RELEC1002	
√	√	√	√	√	√		√	√		√	√		√		√	essentia l	Electronics	RELEC1003	
√	√		√		√	√		√			√	√		√	√	essentia l	/ Factor1	RELEC1004	
		√		√						√					√	help	mathematics	RELEC1005	
√	√	√		√		√	√		√					√		help	Computer / Applications1	RELEC1006	
√	√	√				√	√		√				√	√		essentia l	Engineering and electrical drawing	RELEC1007	
						√						√				help	Human rights and democracy	RELEC1008	
	√					√	√					√				help	Occupational safety	RELEC1109	
√	√	√	√	√	√	√	√	√	√					√	√	essentia l	Electronic digital	RELEC1210	
√	√	√	√	√	√	√	√	√	√					√	√	help	English language	RELEC1211	

General and) transferable skills other skills related to employability and personal (development				Affective and value-based objectives				- Program specific skills objectives				Cognitive objectives				essentia l My choice	Course Name	Course code	Year/Le vel
D4	D3	D2	D1	Q 4	Pa rt 3	Pa rt 2	Pa rt 1	B4	B3	B2	B1	A4	A3	A2	A1				
√	√	√	√	√	√	√	√	√		√	√				√	essentia l	electrical machines	R ELEC2001	Second year
√	√	√	√	√	√	√	√	√		√	√		√		√	essentia l	electrical networks	RELEC2002	
√	√	√	√	√	√	√	√	√		√	√				√	essentia l	Power electronics	RELEC2003	
√	√		√	√	√	√	√	√		√	√	√			√	essentia l	Maintenance Workshop	RELEC2004	
√	√	√	√	√	√	√	√	√		√	√		√		√	essentia l	Industrial establishments	RELEC2005	
√	√	√		√	√	√	√		√					√		help	Computer / Applications2	RELEC2006	
√	√	√	√	√	√	√	√		√	√	√	√	√	√	√	essentia l	Project	RELEC2007	
√	√			√		√	√		√				√	√		essentia l	electrical drawing	RELEC2108	
√	√	√	√	√	√	√	√		√	√	√			√	√	essentia l	Programmable Logic) ControllerPLC (	RELEC2209	
√	√	√	√	√	√	√	√	√	√					√	√	help	English language	RELEC2210	

Course description

First: First Year Courses

1-Electrical circuits and measurements:

which the fundamentals of electrical engineering Introducing the student to includes the laws and theories used to simplify and solve direct current and alternating current electrical circuits.

Technical Institute/ Al-Rumaytha - Al-Furat University, Middle Technical University	• Educational institution
Electrical Engineering Department	• / Scientific Department Center
/ Electrical Circuits and Measurements RELEC1001	• CourseName/Code
Daily attendance is mandatory	• Available forms of attendance
(First semester + Second semester)/ First year	• Semester/Year
hours (total) 120	• Total number of study hours
15/10/2025	• Date this description was prepared
• Course objectives :	
1. the fundamentals of electrical engineering Introducing the student to.	
2. Introducingthe student to the terminology used in electrical circuits .	
3. Introducing the student to how to connect the components of electrical circuits and use devices for measuring electrical quantities.	
4. the laws and theories used in simplifying and To introduce the student to solving direct current and alternating current electrical circuits.	
5. Introducingthe student to the components of the electrical system .	

6. Introducing the student to the principles of electrical circuit components, how to deal with each component, and how to calculate the voltage, current, and power for different types of electrical loads (resistive, inductive, or capacitive).

9- Course outcomes, teaching and learning methods, and assessment :

A- Cognitive objectives:

- A1- Introducing the student to the basic units of electrical quantities and the components of electrical circuits.
- A2- The student possesses the ability to think and solve problems related to electrical circuits.
- A3 - The ability to analyze and think scientifically by applying the laws and theories related to electrical engineering.
- A4 - Introducing the student to single-phase and three-phase alternating current circuits.
- A5-Introducing the student to magnetism, magnetic circuits, and related theories .
- A6- Introducing the student to electrical quantity measuring devices: their components, operating principle, and uses.

B - The specific skills objectives of the course:

- B1- The skill of applying the laws and theories related to electrical and magnetic circuits to solve them and perform the calculations related to them.
- B2- The skill of using electrical quantity measuring devices.
- B3- The skill of measuring electrical power in single-phase or three-phase alternating current circuits.
- B4- The skill of connecting different electrical circuits.
- B5 - The skill of diagnosis, problem-solving, and suggesting alternatives.

Teaching and learning methods :

1. Lectures using modern and traditional methods + laboratories (weekly reports on each experiment conducted) + field visits + summer training.
2. Office activities and access to the international information network (Internet) to obtain additional knowledge for study materials.
3. The practical laboratories are supervised by the subject teacher and the technical staff of the department.
4. The discussion, which involves student participation, addresses some practical problems.d

: Evaluation methods

1. Students are assessed individually by giving them the opportunity to participate in class by answering questions
2. Students are assessed collectively through daily exams with practical and theoretical questions
3. Students are assessed collectively by being given extracurricular assignments such as writing personal reports or those related to practical experiments in laboratories
4. Exams for the first and second semesters and final exams for the first and second rounds

C- Affective and value-based objectives:

C1-Encouraging the development of students' professional and technical thinking.

C2- Practical skills within laboratories and workshops.

C3- Expanding the cognitive horizon and using brainstorming to generate ideas.

Q4- The ability to conduct scientific investigations regarding aspects of electrical circuits.

C5- Adherence to professional ethics and the ability to demonstrate professional competence.

Teaching and learning methods :

1. Using modern methods in presenting the theoretical and practical aspects, such as various electronic display devices, to attract attention and engage students so that the idea reaches the student better.
2. Giving students extracurricular assignments that require self-skills and interpretations to be tested.
3. Questioning students through discussion groups by posing intellectual questions (how, why, when, where, which) on specific topics.
4. 'Using brainstorming and feedback techniques to activate students accumulated experiences by linking what was learned in previous academic stages to new material.
5. To equip students with practical skills through conducting practical experiments on laboratory equipment.

Evaluation methods:

1. Evaluation based on the weekly lecture level.
2. Weekly assessment of the practical aspect in the laboratory.
3. Theoretical and practical semester exams.
4. Final exam, both theoretical and practical.

D - General and transferable skills (other skills related to employability and personal development):

- D1- Working in the field of maintenance and repair of various electrical equipment.
- D2- Working in the field of maintenance and repair of electrical control devices.
- D3- The tendency to cooperate and work collectively.
- D4- Possessing the skill of using the English language in electrical engineering.
- D5- Developing internet research skills.

9- Course structure:

Evaluation Method	Teaching method	Unit/Topic Name	Required learning outcomes	Number of hours	Week
Direct -1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	The system of units used in electricity and the units of measurement for each material (its parts and multiples) are mathematical applications for .converting values using units Definition of the basic units of voltage, current and resistance – components of an electrical circuit – Ohm's law – factors affecting the value of resistance – specific resistance of a conductor .and an insulator	Understanding the subject of unity	4	the first
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	:DC circuits include 1. Connecting resistors in series (with examples) 2- Connecting resistors in parallel (with examples) Mixed resistor connections with examples -3 2.) Star and deltaY /Δ connections for (resistors and conversion from one to the other with examples	Understanding the subject of unity	4	the second
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Applications of series, parallel, mixed, star, and delta connections	Understanding the subject of unity	4	the third
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	١. Kirchhoff's Laws – Definition of Kirchhoff's Laws for Current and Voltage with Solved Questions ٢. Maxwell with solved examples	Understanding the subject of unity	4	Fourth
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	1. Thevenan Theorem – Definition of the Theorem – How it is applied in DC circuits 2. Norton's Theorem – Definition of the Theorem – How it is applied in DC circuits	Understanding the subject of unity	4	Fifth
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Applications of Thevenin and Norton's Theory	Understanding the subject of unity	4	Sixth
Direct - 1 assessment Exams -2 written)	-1 Theoretical lectures	Conformity Theorem – Definition of the Theorem – Steps for its application in solving DC – circuits containing more than one source Solving examples Definition of a current source and a voltage source (DC power distributor) and how to convert from one to the other – Maximum power	Understanding the subject of unity	4	Seventh

+ (practical	-2 Practical application	transfer theory – Definition of the theory and derivation of its relationships – Practical examples			
Direct - 1 assessment Exams -2 (written) + (practical	-1 Theoretical lectures -2 Practical application	‘Alternating currents include: their definition the properties of alternating current, how alternating current is generated, its waveform plotting and related relationships, the definition) of the effective currentRMS value, the (average value and their related relationships for finding the modulation factor and the value factor for irregular waveforms, with practical .examples	Understan ding the subject of unity	4	Eighth
Direct - 1 assessment Exams -2 (written) + (practical	-1 Theoretical lectures -2 Practical application	– Alternating vector quantities – their definition their phase and vector representation – the phase angle and how to find it – finding the resultant of ‘vector quantities, including multiplication division, addition, and subtraction – with practical examples	Understan ding the subject of unity	4	Ninth
Direct - 1 assessment Exams -2 + written) (practical	-1 Theoretical lectures -2 Practical application	Studying the effect of alternating current on a circuit containing only resistance, a circuit containing only pure inductance, and a circuit containing only pure capacitance – finding the phase angle between voltage and current for each .circuit, with solved examples	Understan ding the subject of unity	4	tenth
Direct - 1 assessment Exams -2 (written) + (practical	-1 Theoretical lectures -2 Practical application	The effect of alternating current on a circuit – containing a resistor and an inductor in series a circuit containing a resistor and a capacitor in series – a circuit containing a resistor, an inductor, and a capacitor in series – finding the relationship between current and voltage in the three cases – phase angle – total impedance of the circuit with practical examples	Understan ding the subject of unity	4	eleventh
Direct - 1 assessment Exams -2 (written) + (practical	-1 Theoretical lectures -2 Practical application	The effect of alternating current on a circuit containing a resistor and an inductor in parallel a circuit containing a resistor and a capacitor - in parallel - a circuit containing a resistor, an inductor, and a capacitor in parallel - finding the relationship between current and voltage in the three cases - phase angle - its definition and how to find it - finding impedance - permittivity with practical examples	Understan ding the subject of unity	4	twelfth
Direct - 1 assessment Exams -2 (written) + (practical	-1 Theoretical lectures -2 Practical application	) Using the 1-7 characterizationJ-Operator or (the composite operator to find the total ‘impedance, total permittivity, current, voltage and phase angle of series and parallel impedance .circuits, with solving examples	Understan ding the subject of unity	4	thirteenth
Direct - 1 assessment Exams -2 (written) + (practical	-1 Theoretical lectures -2 Practical application	Resonant circuits include: series resonant circuit; defining the resonant state and how to ‘achieve it; calculating the current, voltage ‘impedance, and frequency angle at resonance finding the bandwidth; finding the quality factor; and plotting the relationship between inductive reactance, capacitive reactance, and .frequency	Understan ding the subject of unity	4	fourteenth

Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	– Parallel resonant circuit – definition calculating current, voltage, impedance impedance angle, phase angle, and resonant frequency – finding the bandwidth – plotting the relationship with frequency – finding the quality factor – solving examples	Understanding the subject of unity	4	fifteenth
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Applying theories such as Norton's theorem Thevenan's theorem, and congruence theorem to alternating current circuits with solved examples	Understanding the subject of unity	4	Sixteenth
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Power in alternating current circuits, including power calculation in: - Circuits containing only - resistance - Circuits containing only inductance Circuits containing only capacitance - Circuits containing resistance, inductance, and capacitance in series and parallel - Definition of active power and how to calculate it - Reactive power and how to calculate it	Understanding the subject of unity	4	seventeenth
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Total apparent power (definition) – How to draw the power triangle – Power factor – its definition and effect on AC circuits – How to improve the power factor – with practical examples	Understanding the subject of unity	4	eighteenth
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Theory of maximum power transmission in alternating current circuits – derivation of its relationships – with examples	Understanding the subject of unity	4	nineteenth
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Practical methods for measuring high, medium and small resistances – using an ohmmeter in series and parallel – the ammeter-voltmeter method – the compensation method – using a Wheatstone bridge – the voltage divider method the switching method – with solved examples – for each method	Understanding the subject of unity	4	Twenty
Direct - 1 assessment Exams -2 + written) (practical	-1 Theoretical lectures -2 Practical application	– Three-phase alternating current circuits definition and how to generate single-phase, two- phase, and three-phase alternating current with a diagram of each circuit. Star and delta connections in three-phase alternating current circuits and the special relationships for calculating line and phase current and voltage total power, line power, and phase power Features of each connection when used with balanced and unbalanced loads, with solved examples	Understanding the subject of unity	4	Twenty first-

Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Solve practical examples on three-phase alternating current with delta and star connections, using balanced and unbalanced loads	Understanding the subject of unity	4	Twenty second-
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Methods of measuring power for three-phase loads – Wattmeter: how to connect it to the circuit to measure active power – and calculating reactive power and apparent power with a solved example Measuring power using a wattmeter and voltage How to find the total power this way in the case – of star and delta connections – Using two wattmeters – Using three wattmeters	Understanding the subject of unity	4	Twenty third-
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Magnetism – Magnetic Circuit – Introduction to North and South Pole Magnetism – Types of Magnetic Materials – Basic Properties and Definitions of Magnetic Materials, including – Magnetic Field – Magnetic Flux Magnetomotive Force – Magnetic Flux Density – and Factors Affecting Magnetic Flux Permeability and its Effects – Magnetic Circuits and the Application of Kirchhoff's Laws to Them	Understanding the subject of unity	4	Twenty fourth-
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Solve practical examples of magnetism	Understanding the subject of unity	4	Twenty fifth-
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Self-induction of a coil (electromagnetic induction) – its definition – special relationships for finding the self-induction of a coil – mutual induction between two coils – and relationships for finding mutual induction according to the type of connection between the two coils including: covalent and anti-coupled series connections	Understanding the subject of unity	4	Twenty sixth-
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Current growth and decay curves in an inductive circuit – Explanation of this circuit and its effect on direct current – General relationship for current growth and decay in a coil – Current – plotting and calculation of the time constant Solving examples Charging and discharging capacitors, including their use in DC circuits; the general relationship between charging and discharging a capacitor and drawing the current; the effect of the time constant and its calculation; and solving examples	Understanding the subject of unity	4	Twenty - seventh
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Measuring instruments include: types of measuring instruments, their operation, moving-coil measuring instruments, their construction and use in measuring voltage and current mentioning their advantages and disadvantages and a diagram of the instrument	Understanding the subject of unity	4	Twenty eighth-

Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	The iron-core measuring device – its structure and how to use it in measurement – its advantages and disadvantages, and a diagram of the device	Understand the subject of unity	4	Twenty ninth-
Direct - 1 assessment Exams -2 written) + (practical	-1 Theoretical lectures -2 Practical application	Wattmeter – its construction – drawing the device's diagram – its placement in the electrical circuit for power measurement – torque – equations – its advantages – its disadvantages oscilloscope – drawing the device – its construction – how to operate and use it	Understand the subject of unity	4	thirty

10- Infrastructure:

The textbook (Electrical Circuits and Measurements)	1. Required textbooks
1-Electrical Technology ((Edward Hughes)) 2-Principles of Electrical Engineering (Dr . Muhammad Zaki, Dr. Muzaffar Anwar Al-Na'ma)	2.Main references (sources)
1- Electrical circuits /Joseph A. Edminister . 2- Introduction to Electric circuits ((M. Romanwitz)) 3- Introductory circuits analysis / Robert Boylestad .	a) Recommended books and references (scientific journals reports, etc).
The website of the Middle Euphrates Technical University Technical Institute/Rumaytha Location	b) Electronic references, websites...

:Curriculum Development Plan -11

- 1- Follow the latest releases on websites and in public libraries.
- 2- Access to the latest equipment and technologies in the field of work.
- 3- Participate in the various courses related to the subject .
- 4- To learn about the latest advancements in modern technology in this field.
- 5- Preparing courses that develop the capabilities of trainers in the laboratory so that they can train students more efficiently.

6- Equipping laboratories with modern equipment that keeps pace with scientific development in developed countries.

2-Electrical installations :

Introducing the student to the different electrical installation systems for buildings and factories, as well as the means of control and protection for electrical circuits.

Technical Institute/ Al-Rumaytha - Al-Furat University, Middle Technical University	1-Educational institution
Electrical Engineering Department	2- Scientific Department/ Center
/ Electrical Installations RELEC1002	3-Course Name/Code
Daily attendance is mandatory	4- Available forms of attendance
(First semester + Second semester)/ First year	5-Term / Year
hours (total) 120	6-Number of study hours (total)
15/10/2025	7- Date this description was prepared
8- Course Objectives:	
General objective: To introduce the student to different electrical installation systems.	
Specific objective: The student will be able to identify electrical materials and wiring systems used in laboratories and homes, establish and install electrical machines, and learn methods of controlling and protecting different loads during installation.	
The student will be able to gain practical knowledge of electrical installations (lighting) in addition to how to install and set up electrical machinery.	

9-Course outcomes, teaching and learning methods, and assessment

A- Cognitive objectives:

- 1-Introducing the student to different electrical installation systems
 - 2-Introducing the student to electrical materials
 - 3-Introducing the student to the wiring systems used in laboratories and homes
 - 4- Introducing the student to the methods of establishing and installing electrical machines
 - 5- Introducing the student to methods of controlling and protecting different loads in the foundation
- Practical training for the student in electrical installations (lighting) in addition to how to install and set up electrical machines.

B - Course-specific skills objectives:

- 1-Conducting practical experiments that verify the theoretical aspect
- 2-Acquiring skills in various electrical installations
- 3-Acquiring wiring skills used in factories and homes
- 4-Acquiring the skill of installing and setting up electrical machinery
- 5- Acquiring the skill of designing and implementing methods of control and protection for different loads in the foundation

Teaching and learning methods:

1. Lectures using modern and traditional methods + laboratories (weekly reports on each experiment conducted) + field visits + summer training.
2. Office activities and access to the international information network (Internet) to obtain additional knowledge for study materials.
3. The practical laboratories are supervised by the subject teacher and the technical staff of the department.
4. The discussion, which involves student participation, addresses some practical problems.

: Evaluation methods

1. Students are assessed individually by allowing them to participate in class by answering questions.
2. Students are assessed collectively through daily exams with practical and theoretical questions.
3. Students are assessed collectively by being given extracurricular assignments such as writing personal reports or those related to practical experiments in laboratories.
4. Exams for the first and second semesters and final exams for the first and second rounds.

C- Affective and value-based objectives:

- 1-Encouraging the development of students' professional and technical thinking.
- 2-Practical skills within laboratories and workshops .
- 3-Expanding the cognitive horizon and using brainstorming to generate ideas .
- 4-Developing internet research skills.
- 5- The ability to conduct scientific investigations regarding aspects of electrical installations.
- 6- Adherence to professional ethics and the ability to demonstrate professional competence.

Teaching and learning methods:

1. Using modern methods in presenting the theoretical and practical aspects, such as various electronic display devices, to attract attention and engage students so that the idea reaches the student better.
2. Giving students extracurricular assignments that require self-skills and interpretations to be tested.
3. Questioning students through discussion groups by posing intellectual questions (how, why, when, where, which) on specific topics.
4. Using brainstorming and feedback techniques to activate students' accumulated experiences by linking what was learned in previous academic stages to new material.
5. To equip students with practical skills through conducting practical experiments on laboratory equipment.

Evaluation methods:

1. Evaluation based on the weekly lecture level.
2. Weekly assessment of the practical aspect in the laboratory.
3. Theoretical and practical semester exams.
4. Final exam, both theoretical and practical.

D - General and transferable skills (other skills related to employability and personal development) :

- 1-Practical skills within workshops, laboratories, and labs
- 2- Skills in designing and implementing methods of control and protection for different loads in the foundation
- 3-Skills in various electrical installations
- 4-Wiring skills used in laboratories and buildings
- 5- Skills in installing and setting up electrical machinery

10- Course structure:

Evaluation Method	Teaching method	Unit/Topic Name	Required learning outcomes	Hours	Week
Direct assessment + written and practical exams	Theoretical lectures + practical application	An overview of the curriculum vocabulary for the subject and the scientific resources, including textbooks and supplementary materials - Classification of materials into • Electrical conductors • Semiconductors • Insulators	Understanding the subject of unity	4	the first
Direct assessment + written and practical exams	Theoretical lectures + practical application	Principles of Electricity - Potential difference, current intensity electric current intensity (amperes), factors affecting electric current intensity - resistance, factors affecting resistance Components of an electrical circuit - Source, types of electrical sockets, wires and their types, electrical loads of all types - Keys, their types and protection equipment junction boxes - Electric lamps, their types and uses	Understanding the subject of unity	4	the second
Direct assessment + written and practical exams	Theoretical lectures + practical application	Electrically conductive materials - Copper – Electrical properties of copper Mechanical properties of copper - Aluminum: of Electrical Properties Mechanical Properties of – Aluminum Aluminum - Their features and uses in the field of electricity - High-strength alloys – properties that make them good elements for electrical applications	Understanding the subject of unity	4	the third
Direct assessment + written and practical exams	Theoretical lectures + practical application	insulating materials Examples of insulating materials – air, oil: their properties and uses Properties of insulating materials with respect to – their temperature resistance Solid insulating materials (cotton, paper, asbestos – fiberglass, synthetic fabrics and films, mica, other materials), permittivity(dielectric constant): laws and solved examples	Understanding the subject of unity	4	Fourth

Direct assessment + nt written and practical exams	Theoretical lectures + practical application	Magnetic properties of materials Magnetic force, types of magnetic materials, related terminology – magnetic properties – laws of magnetism Solved examples	Understanding the subject of unity	4	Fifth
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	magnetic circuits – .Applying Kirchhoff's laws to it – Solved examples of magnetism	Understanding the subject of unity	4	Sixth
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	Mechanical properties of electrical materials .Tensile strength, stress, elongation, elasticity – other Solved examples	Understanding the subject of unity	4	Seventh
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	Stages that electrical energy goes through Electricity generation (a brief overview of types of – power plants) .Transmission of electrical power (systems used – advantages and disadvantages) Secondary uplink and downlink stations and their – capacities Distribution of electrical power (systems used) of – all types	Understanding the subject of unity	4	Eighth
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	Basic principles on how to prepare the consumer – from a secondary station, the materials required for this, and the type of consumer Home and industrial distribution boards – (installation and connection) How to supply a large building with electricity, with .an example The capacity of the electrical transformers used – (KVA) and their locations in the electrical network solved examples Diagrams and –	Understanding the subject of unity	4	Ninth
Direct assessment + nt written and	Theoretical lectures + practical	Types of switches used in electrical installations and their importance) Traditional switch –Toggle Switch (.single pole (two-way, middle, double pole, triple pole Push –button switch	Understanding the subject of unity	4	tenth

practical exams	application	Other (from recently used) – Draw electrical circuits containing these switches – in complete circuits			
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	devices used in electrical installations Protective fuses)) .Definition of (fuse, rated current, melting current – melting coefficient, expected current and cut-off current, melting time, electric arc duration, total operating time) Types of fuses with the advantages and .disadvantages of each, and how to choose a fuse Coordination between fuses in the same electrical circuit	Understanding the subject of unity	4	eleventh
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	Circuit Breakers <i>Magnetic Circuit Breakers Their Construction and : Operating Principle</i> <i>Based on its operating principle(Magnetic and Thermal Circuit Breakers)</i> <u>Miniature Circuit Breakers(MCBs) : Installation and Wiring</u> <u>Ground leakage circuit breaker – (Earth leakage circuit breaker) ELCB: Structure and Operating Theory</u> How to distribute loads within the building using – and calculate the circuit the distribution panel breaker capacity	Understanding the subject of unity	4	twelfth
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	Electrical Wiring Systems Uninsulated conductor system –(BB) robust , rubber banding system(TRS) PVC , insulated conductor systemsPCP insulated conductor systems , wiring systems inside plastic pipes and the necessary tools, numbering wires and cables during installation, and considering wire .colors during setup	Understanding the subject of unity	4	thirteenth
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	Home electrical installations Types of home electrical installations, their advantages and disadvantages, safety requirements, cost, required durability, and the .overall appearance and shape of the installation Tools used in home construction Establishing factories and workshops and – calculating costs	Understanding the subject of unity	4	fourteenth

Direct assessment + nt written and practical exams	Theoretical lectures + practical application	Grounding - Grounding) ComponentsEarth and its resistance, andEarth Resistivity) - Grounding electrodes , bonding and connection equipment - Different methods for reducing grounding resistance. - Devices and equipment that mustbe grounded - The Importance of Good Grounding - The difference between a grounded and ungrounded system, and methods of measurement(grounding and measuring).	Understanding the subject of unity	4	fifteenth
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	Lightningrod - Lightning, the importance of lightning rods components of lightning rods - Important factors when designing a Equipment and structures lightning rod that must be protected from lightning	Understanding the subject of unity	4	Sixteenth
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	electric shock - Definition, causes, relationship between potential difference and current, current path, current intensity through the body current duration, and causes of electric shock - General rules for shock safety and post-shock procedures - Factors that influence the effect of electric current on the body - Preventive measures that can be taken to protect against electrical hazards	Understanding the subject of unity	4	seventeenth
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	Protection against electrostatic leakage current - Earthleakage current circuit breaker - Earthleakage voltage circuit breaker - Locations for installing electro-leakage circuit breakers(ELCBs): Determine the breaker capacity according to the load	Understanding the subject of unity	4	eighteenth
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	Single and three-phase watt-hour (kWh meter (- Theory of operation, wiring, installation and how to read the meter; meter installation	Understanding the subject of unity	4	nineteenth

	applicati on	- Meter adjustment methods in case of errors (speed – crawl – light load) - Smart meter – its components, how to connect it, and how to read it			
Direct assessme + nt written and practical exams	Theoreti cal lectures + practical applicati on	Inspection and testing of residential and industrial electrical installations - The probe checked polarity, performed insulation resistance testing, and .performed a loop circuit continuity test - How to find faults in electrical power supply cables (cuts, short circuits, and all types) - Locating the ground fault in conductors using a Murray loop	Understa nding the subject of unity	4	Twenty
Direct assessme + nt written and practical exams	Theoreti cal lectures + practical applicati on	Alarm and warning circuits – circuit components (bells), pushbuttons, heat, flame, and smoke detectors, indicators, power supply, connectors and cables and their specifications	Understa nding the subject of unity	4	Twenty– first
Direct assessme + nt written and practical exams	Theoreti cal lectures + practical applicati on	Fire and theft alarm and protection systems (open (and closed - Indoor and outdoor surveillance systems (cameras), fire alarm and detection systems • - Laser lighting applications - Fiber optic lighting • Sound-activated lighting systems	Understa nding the subject of unity	4	Twenty– second
Direct assessme + nt written and practical exams	Theoreti cal lectures + practical applicati on	- Call system used in hotels, restaurants and hospitals - Intercommunication system – signaling system in departments and hospitals	Understa nding the subject of unity	4	Twenty– third
Direct assessme + nt written and practical exams	Theoreti cal lectures + practical applicati on	DC Motors - – Structure – Theory of Operation - Classification – DC Motor Applications - How to perform the wiring and solved mathematical examples	Understa nding the subject of unity	4	Twenty– fourth

Direct assessment + nt written and practical exams	Theoretical lectures + practical application	AC Motors - Single-phase induction – structure) motor (operating theory – types - Three-phase induction – structure) motor (operating theory – types	Understanding the subject of unity	4	Twenty-fifth
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	circuits and control circuits - – Switches used in control circuits Push button switches) Rotary switches –ON–OFF) (Rev–ON–OFF) Star Delta rotary switch (Δ–Y) - Power circuit and control circuit for operating a single-phase motor and a three-phase motor	Understanding the subject of unity	4	Twenty-sixth
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	- Air contactors (actuators): Construction – Theory of operation – Operating voltage – Contactor Types of , control circuits contactors The information printed on the receiver is the coil voltage, electrode voltage, electrode current or .power, and operating time - the circuit for switching a Explanation of device on and off(ON–OFF) using a singlepush button and a pickup	Understanding the subject of unity	4	Twenty-seventh
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	- Thermal overcurrent monitoring - Composition – Theory of operation) (Current rating adjustment – Uses - Protection with reverse time–current surge system - Inverse Time Over current Relaying Example solution	Understanding the subject of unity	4	Twenty-eighth
Direct assessment + nt written and practical exams	Theoretical lectures + practical application	Timer - – Its types (mechanical – electronic programmed) – theory of operation – time control – low–voltage monitoring - Types of time–delay relays based on function – Types of time–delay relays based on structure - Its applications in electrical installation circuits	Understanding the subject of unity	4	Twenty-ninth

Direct assessment + written and practical exams	Theoretical lectures + practical application	Testing and inspection of electrical installations – testing devices Ohmmeter (resistance meter), battery-operated bell or light system, micrometer ground tester – Types of tests Polarity test, grounding system quality test wire insulation resistance test, continuity test The circle a ring	Understanding the subject of unity	4	thirty
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11- Infrastructure:

Electrical installations and machinery ‘Authored by Dr. Muzaffar Anwar Al-Na’ma .Nouri Bawi Dawood, Jabbar Ubaid Kadhim	1.Required textbooks
1- Electrical installation and workshop technology Vol. I, II, III (by F.G. Thompson). 2- Electrical installation technology (by Michael Needle) .	2.Main references (sources)
1- Practice on low voltage switch gears (by Siemense Publications). 2- ABB Publications	a) Recommended books and references (scientific journals (.reports, etc
1-Location of the Technical Institute/ Al-Rumaytha 2- Websites of global companies such as Siemens and ABB	‘b) Electronic references websites...

12-Curriculum Development Plan:

1- Participating in the various courses related to the subject . 2- To learn about the latest advancements in electrical installation technology. 3- Preparing courses that develop the capabilities of trainers in the laboratory so that they can train students more efficiently. 4- Equipping laboratories with modern equipment that keeps pace with scientific developments in developed countries. 5-Follow the latest releases on websites and in public libraries. 6-Staying informed about the latest equipment and technologies in the field of work .
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3-Electronics:

Introducing the student to electronic components manufactured from semiconductors of different types, their structure, properties, uses in electronic circuits, and applications of these circuits.

Technical Institute/ Al-Rumaytha - Al-Furat University, Middle Technical University	1-Educational institution
Electrical Engineering Department	2- Scientific Department/ Center
/ ElectronicsRELEC1003	3-Course Name/Code
Daily attendance is mandatory	4- Available forms of attendance
(First semester + Second semester)/ First year	5-Term/Year
hours (total) 120	6- Number of study hours (total)
2025/10/15	7- Date this description was prepared

8-Course Objectives

General objective: Introducing the student to the different electronic components.

Specific objective: The student will be able to become familiar with: the electronic components manufactured from semiconductors of different types– their structure – their properties – their uses in electronic circuits – their applications – the analysis of their electronic circuits with optoelectronic components and their applications.

The student will be able to:

1. Use basic electronic equipment found in the laboratory.
2. Connect electronic components in simple electronic circuits
3. Understand the specifications and features of electronic components
4. Identifying and implementing the circuitry for some components

9-Course outcomes, teaching and learning methods, and assessment

A- Cognitive objectives:

- A1 – Introducing the student to the different electronic components
- A2– Introducing the student to the different types of electronic components manufactured from semiconductors
- A3– Introducing the student to the use of electronic components in electronic circuits
- A4– Introducing the student to the analysis of electronic circuits and their applications
- A5– Introducing the student to the basic electronic equipment found in the laboratory
- A6– Training the student to connect electronic components in simple electronic circuits
- A7– Introducing the student to the specifications and features of electronic components
- A8– Introducing the student to the applied circuits of some components and their implementation

B - The specific skills objectives of the course:

- B1 – Conducting practical experiments that verify the theoretical aspect
- B2 – Acquiring the skill of using electronic components in electronic circuits
- B3 – Acquiring the skill of analyzing electronic circuits and their applications
- B4– Acquiring the skill of connecting electronic components in simple electronic circuits
- B5– Acquiring the skill of designing and implementing applied circuits for some components

Teaching and learning methods :

1. Lectures using modern and traditional methods + laboratories (weekly reports on each experiment conducted) + field visits + summer training.

2. Office activities and access to the international information network (Internet) to obtain additional knowledge for study materials.
3. The practical laboratories are supervised by the subject teacher and the technical staff of the department.
4. Discussion with student participation that addresses some practical problems.

Evaluation methods :

1. Students are assessed individually by allowing them to participate in class by answering questions.
2. Students are assessed collectively through daily exams with practical and theoretical questions.
3. Students are assessed collectively by being given extracurricular assignments such as writing personal reports or those related to practical experiments in laboratories.
4. Exams for the first and second semesters and final exams for the first and second rounds.

C- Affective and value-based objectives:

C1-Encouraging the development of students' professional and technical thinking

C2-Practical skills within laboratories and workshops .

C3- Expanding the cognitive horizon and using brainstorming to generate ideas.

C4- The ability to conduct scientific investigations regarding aspects of electronic components.

C5- Adherence to professional ethics and the ability to demonstrate professional competence.

Teaching and learning methods :

1. Using modern methods in presenting the theoretical and practical aspects, such as various electronic display devices, to attract attention and engage students so that the idea reaches the student better.
2. Giving students extracurricular assignments that require self-skills and interpretations to be tested.
3. Questioning students through discussion groups by posing intellectual questions (how, why, when, where, which) on specific topics.

4. Using brainstorming and feedback techniques to activate students' accumulated experiences by linking what was learned in previous academic stages to new material.
5. To equip students with practical skills through conducting practical experiments on laboratory equipment.

Evaluation methods:

- Evaluation based on the weekly lecture level.
- Weekly assessment of the practical aspect in the laboratory.
- Theoretical and practical semester exams.
- Final exam, both theoretical and practical.

D - General and transferable skills (other skills related to employability and personal development) :

D1- Practical skills within workshops, laboratories, and labs

D2- Skills in using electronic components in electronic circuits

D3- Skills in analyzing electronic circuits and their applications

D4-Working in the field of maintenance and repair of electrical control devices

D5- Enabling students to integrate into the work environment and try to deal with people.

D6- Enabling students to prepare scientific reports for their future professional lives.

D7- Enabling students to pass professional tests organized by employers.

D8- Enabling students to engage in continuous self-development after graduation.

10-Course structure:

Evaluation Method	Teaching method	Unit/Topic Name	Required learning outcomes	Hours	Week
Direct assessment + t written and practical exams	Theoretical lectures application + practical	– Semiconductor theory – Atomic structure Energy levels – Crystals – Conductivity in crystals – Gap current – How gaps move	Understanding the subject of unity	4	the first
Direct assessment + t written and practical exams	Theoretical lectures application + practical	P -type crystal-N type crystal , electron-current and hole current – total resistance	Understanding the subject of unity	4	the second
Direct assessment + t written and practical exams	Theoretical lectures application + practical	– Semiconductor DiodesPN Junction – Evacuation Region Formation – Barrier – Potential – Power Hill – Thermal Effects Biased Diode – Forward Bias – Reverse Bias – Forward and Reverse Bias Characteristic Curves – Vanishing Crossover Current – Minor Carrier Current Surface Leakage Current – Breaking –) Potential – Breakdown PotentialPIV – (Maximum Forward Current – Maximum) – Reverse PotentialPIV _{max} Diode – (Equivalent Circuit	Understanding the subject of unity	4	+ Third Fourth
Direct assessment + t written and practical exams	Theoretical lectures application + practical	– Diode as a rectifier – Half-wave rectifier Continuous current value and its calculation Effective value output frequency –	Understanding the subject of unity	4	Fifth
Direct assessment + t written and practical exams	Theoretical lectures application + practical	Full-wave rectification – using a center- – switched transformer – bridge rectifier calculating continuous and effective current – values – determining output frequency comparison between half-wave and full- wave rectifiers – comparison between full- wave rectifiers	Understanding the subject of unity	4	Sixth

Direct assessment + t written and practical exams	Theoretical lectures application + practical	– Filters – Capacitor filtering LC filter – RC filter – Constant voltage ripple	Understanding the subject of unity	4	Seventh
Direct assessment + t written and practical exams	Theoretical lectures application + practical	Ripple factor, voltage multiplier, trimming circuits – positive trimming – negative trimming – combined trimming	Understanding the subject of unity	4	Eighth
Direct assessment + t written and practical exams	Theoretical lectures application + practical	– Zener diode – its structure – its symbol – its properties – avalanche refraction – Zener refraction – refractive potential – power tolerance – Zener impedance temperature effects – Zener approximation DC voltage regulation –	Understanding the subject of unity	4	Ninth + Tenth
Direct assessment + t written and practical exams	Theoretical lectures application + practical	Bipolar transistor – its structure – its regions) – its symbol – biasing voltages $-\alpha_{DC}$ () $-\beta_{DC}$) the relationship between $-\alpha_{DC}$) – $(\beta_{DC}$ types of bias – approximation – (of the transistor and the circuit	Understanding the subject of unity	4	+ Eleventh Twelfth
Direct assessment + t written and practical exams	Theoretical lectures application + practical	Transistor characteristic curves – Operating) regions: Definition of I_{CBO}) and I_{CEO} Current gain curve – Relationship – () between I_C) and $(I_{CEO}$ (	Understanding the subject of unity	4	thirteenth
Direct assessment + t written and practical exams	Theoretical lectures application + practical	– Transistor bias circuits – base bias emitter bias	Understanding the subject of unity	4	fourteenth
Direct assessment + t written and practical exams	Theoretical lectures application + practical	Collector bias – Self-bias – Feedback bias Voltage divider bias – Practical examples –	Understanding the subject of unity	4	+ Fifteenth Sixteenth
Direct assessment + t	Theoretical lectures application +	The transistor's continuous equivalent circuit – continuous load line	Understanding the	4	seventeenth

written and practical exams	practical		subject of unity		
Direct assessment + t written and practical exams	Theoretical lectures application + practical	– Action Points Q-Point Practical : Examples	Understanding the subject of unity	4	eighteenth
Direct assessment + t written and practical exams	Theoretical lectures application + practical	– Transistors in small signal amplification AC equivalent circuit – Perfect approximation – Hybrid constants Equivalent circuit using h-parameters – Voltage gain – Current gain – Power gain Input and output impedances – Small – signal amplifiers – Base market – Emitter market	Understanding the subject of unity	4	The nineteenth the twentieth and the twenty-first
Direct assessment + t written and practical exams	Theoretical lectures application + practical	– Using a transistor in voltage regulation series regulator – parallel regulator – DC voltage source circuit	Understanding the subject of unity	4	Twenty-second
Direct assessment + t written and practical exams	Theoretical lectures application + practical	) Junction Field Effect Transistor JFET – (its structure – its symbol – theory of operation – characteristic curves – cross-conductivity curve – definition of narrow) voltage V_{P}) $(I_{DSS}$) $(V_{GS(off)}$ characteristic curves of – () MOSFET) – (D-MOSFET) – (E-MOSFET (	Understanding the subject of unity	4	Twenty-third Twenty- + fourth
Direct assessment + t written and practical exams	Theoretical lectures application + practical	FET – Bias Circuits – DC Source Bias Self-Biasing Operating Point – Equivalent Circuit of the FET Use of FETs in Small Signal Amplification	Understanding the subject of unity	4	Twenty-fifth Twenty- + sixth
Direct assessment + t written and practical exams	Theoretical lectures application + practical	Comparison between types of FETs) FET) MOSFET () And between BJT (	Understanding the subject of unity	4	Twenty-seventh

Direct assessment + written and practical exams	Theoretical lectures application + practical	) Light-dependent resistor LDR Light – (emitting diode – Photodiode: Seven-piece circuit board: its structure and applications	Understanding the subject of unity	4	Twenty-eighth
Direct assessment + written and practical exams	Theoretical lectures application + practical	The phototransistor – its structure – its operation – its applications – the process	Understanding the subject of unity	4	Twenty-ninth Thirtieth

: Infrastructure -11

Principles of Electronics 1984– T. A. Malvino translated by Badr Muhammad Ali Al-Watar Dr. Riyadh Kamal	1.Required textbooks
Industrial Electronics 1985 – Authors: Daa Mahdi Fares, Nabil Younes, Helmy Amin	2.Main references (sources)
semiconductors (KI Gross & JY Rwood) Power Electronics 1991 – Authors: Daa Mahdi Faris, Youssef Ibrahim Taha	a) Recommended books and references (scientific journals, .reports, etc
Technical Institute/ Rumaytha website websites of international companies	b) Electronic references. websites...

12-Curriculum Development Plan :

- 1- Participating in various courses related to electronics.
- 2- Accessing the latest advancements in modern technology in this field
- 3- Developing training courses that enhance the capabilities of laboratory trainers to train students more effectively.
- 4- Equipping laboratories with modern equipment that keeps pace with scientific developments in developed countries.

4- Coefficient/1

The student acquires manual skills in using hand tools and measuring instruments, operating devices and machines, and using them in the workshop metalworking, welding, sheet metal work, turning, carpentry, and electrical workshop.

Al-Furat Technical Institute/ Al-Rumaytha Middle Technical University	1-Educational institution
Electrical Engineering Department	2- Scientific Department / Center
/ Coefficient 1 RELEC1004	3-Course Name/Code
Daily attendance is mandatory	4-Available forms of attendance
(First semester + Second semester)/ First year	5-Term/Year
hours (total) 180	6-Number of study hours (total)
2025/10/15	7- Date this description was prepared
8- Course Objectives : The student will be able to:	
1. It uses the various devices, tools, and components used in workshops.	
2. He gains the skill and technical expertise in various electrical maintenance works.	
3. He gains self-confidence to perform electrical technical work in troubleshooting faults and learning how to repair them.	
4. It distinguishes and identifies the various electrical and electronic components and how to use them in building different circuits.	

5. He learns how to use the equipment, tools, and machinery used in workshops that assist with electrical maintenance work.

9-Course outcomes, teaching and learning methods, and assessment

A- Cognitive objectives:

A1 – Qualifying students of the Electrical Technologies Department to be able to work in government departments or the private sector for various electrical maintenance work and troubleshooting.

A2– Qualifying students of the Electrical Technologies Department to enable them to distinguish between different electrical and electronic components and use them in building different circuits.

A3– Qualifying students of the department Electrical Technologies to be able to acquire the skill and technical expertise in the field of maintenance work.

A4-Distinguish and learn the methods of winding different electrical machines.

B)Course–specific skills objectives :

B1– Acquiring technical skills and experience in the field of electrical maintenance work.

B2– The ability to acquire modern methods of learning, evaluation, and critical thinking regarding cases of electrical energy waste.

B3– Ability to manage workshops for electrical machinery.

B4– Developing and enhancing the student's scientific abilities and practical skills in identifying types of manual winding machines or using machines.

B5– The ability to distinguish between electrical machines such as motors and transformers.

Teaching and learning methods:

1– To provide students with the basics and additional topics related to the learning outcomes of ,previous skillstosolve practical problems .

2– Applying the topics studied theoretically at the practical level in the various workshops of the department.

3– Organizing visits and scientific trips to electrical maintenance workshops in production sites.

4– Using hand tools and measuring instruments, and the ability to work and operate machines in the best way.

5–about the maintenance of electrical appliances Showing scientific films.

Evaluation methods :

1. Ongoing evaluation of student work in the workshop.
2. Students are assessed individually by giving them the opportunity to participate in class by answering questions.
3. Students are assessed collectively through daily exams with practical and theoretical questions.
4. Students are assessed collectively by being given extracurricular assignments such as writing personal reports or those related to practical experiences in the workshop.

C- Affective and value-based objectives:

C1-Practical skills that enable the student to research, identify, and fix faults in electrical devices.

C2-Practical skills that enable the student to cooperate in work with others .

C3– Maintaining the safety of the equipment and furniture in the workshop, as it is public property.

C4–The student's ability to think systematically and therefore to make decisions .

C5–Encouraging students to gather information that increases their knowledge .

C6–Encouraging the student to acquire individual skills in the work environment .

C7–Implementing small practical and applied projects .

Teaching and learning methods :

1. To equip students with practical skills through carrying out maintenance work in electrical workshops.
2. Conducting experiments that stimulate a spirit of cooperation among students.
3. Using the group method in education.
4. Sending students for training in electricity departments, hospitals, power generation stations, and maintenance units in production plants during summer training.

Evaluation methods :

1. Attendance at the lecture and discussion with student participation.
2. The tests are conducted during the lecture.
3. Creating explanatory posters.

4. Students are assessed collectively through practical exams.
5. Student performance evaluation during summer training by the supervisor at the work site.

D - General and transferable skills (other skills related to employability and personal development) :

D1 :Enabling students to prepare scientific reports for their future professional lives .

D2: Empowering students to have self-confidence in problem-solving.

D3: Enabling students to integrate into the work environment and try to deal with people.

D4: Enabling students to pass professional tests organized by employers.

D5: Enabling students to engage in continuous self-development after graduation.

D6: Enabling students to use work equipment correctly.

10- Course structure:

Evaluation Method	Teaching method	Unit/Topic Name	Required learning outcomes	Hours	Week
Ongoing assessment	1- Using numbers and tools 2- Performing exercises	Metalworking workshop	Introducing the student to the importance of the workshop the work involved and the available tools and equipment	6	+ First + Second Third

Ongoing assessment	-1 Using numbers and tools -2 Performing exercises	Welding workshop	Introducing the student to the importance of the workshop the work involved and the available tools and equipment	6	+ Fourth + Fifth Sixth
Ongoing assessment	-1 Using numbers and tools -2 Performing exercises	Auto body shop	Introducing the student to the importance of the workshop the work involved and the available tools and equipment	6	+ Seventh + Eighth Ninth
Ongoing assessment	-1 Using numbers and tools -2 Performing exercises	lathe workshop	Introducing the student to the importance of the workshop the work	6	+ Tenth Eleventh Twelfth +

			،involved and the available tools and ،equipment		
Ongoing assessment	-1 Using numbers and tools -2 Performing exercises	carpentry workshop	Introducing the student to the importance of the ،workshop the work ،involved and the available tools and ،equipment	6	Thirteenth + Fourteenth + Fifteenth
Ongoing assessment	-1 Using numbers and tools -2 Performing exercises	Basic principles of industrial safety that the student needs inside the workshop to protect him from electric shocks and the best ways to use tools of various types Learning to identify standard wire diameters using tables, how to find equivalent wires of the same metal or other metals if wire sizes are unavailable, training in the use of equipment in workshops, training in the use of a micrometer to measure wire diameters used in coils, and training in the use of a vernier caliper for general ،measurements	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	Sixteenth

Ongoing assessment	-1 Using numbers and tools -2 Performing exercises	Proficient training in the soldering process using electric soldering irons (of varying power ratings) familiarization with the parts of the soldering iron, study of insulation types and insulators, insulation of coils from the body, insulation of coils from each other, insulation of the wires themselves, and their applications	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	seventeenth
Ongoing assessment	- 1 Using numbers and tools -2 Performing exercises	The different types of resistors, the materials used in their manufacture, their coding methods, preferred resistor values how to test resistors, variable resistors, their types, classification testing, and applications, some) special resistors NTC (PTC (VOR) and their applications replacing damaged resistors and the factors to consider, the different types of capacitors, how to manufacture them, capacitor coding methods, capacitor testing replacing damaged capacitors and the factors to consider, building a differentiator/integrator circuit using a resistor and a capacitor and testing it	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	eighteenth
Ongoing assessment	-1 Using numbers and tools -2 Performing exercises	Different types of coils, their manufacturing, testing, methods of encoding and reading coil inductance, electrical transformers as an application of coils, their types and uses, testing methods building and testing circuits of joints and integers using resistance and inductance Semiconductors, diodes, how to test and identify their terminals their uses, Zener diodes, their properties, their uses as variable capacitors, building and testing a half-wave rectifier circuit	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	nineteenth

		•The transistor: how to test it) determine its typeNPN (PNP) •identify its terminals (emitter collector, and base), transistor			
Ongoing assessment	-1 Using number s and tools -2 Performing exercises	Printed circuit boards (PCBs) and regular PCBs used in building electronic circuits; how to drill them; how to design and mount electronic circuits on PCBs soldering on PCBs; mounting and soldering various electronic components on a PCB disassembling electronic circuits mounted on a PCB and removing components; cleaning the PCB and the tools used for this •Training in making wooden molds step by step, and different steps and learning about metal molds	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	Twenty
Ongoing assessment	-1 Using number s and tools -2 Performing exercises	Training on making coils using different types of winding methods manual winding, die winding, and) .(bundle winding	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	Twenty-first
Ongoing assessment	-1 Using number s and tools -2 Performing exercises	Studying the components of an air-cooled water pump, identifying common mechanical and electrical faults and their solutions, and understanding how to reverse the direction of motor rotation Disassemble and reassemble the water pump parts for the air cooler then operate it after reassembly and troubleshoot any errors	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	Twenty-second

Ongoing assessment	-1 Using numbers and tools -2 Performing exercises	Training on drawing and rewinding the windings of an air-cooled water pump motor performing various tests, including continuity testing	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	Twenty-third
Ongoing assessment	-1 Using numbers and tools -2 Performing exercises	Ground leakage testing, coil short circuit testing, polarity testing motor operation, and troubleshooting of electrical and mechanical faults Studying the theory of operation of electric irons and their components, training in disassembling and assembling iron parts, and identifying types of malfunctions and how to fix them	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	Twenty-fourth
Ongoing assessment	-1 Using numbers and tools -2 Performing exercises	Studying the components of a table fan, practicing disassembling and reassembling it, identifying mechanical and electrical faults and how to fix them Studying the components of a ceiling fan, training in disassembling and reassembling it identifying mechanical and electrical faults, and how to fix them	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	Twenty-fifth
Ongoing assessment	-1 Using numbers and tools -2 Performing	Studying transformer types and identifying their components simplified design, winding installation, and testing of a single-output step-down transformer; and similarly, simplified design winding, installation, and testing of a step-down transformer with a medium input	Using –1 equipment and tools in the workshop Acquiring –2 skills	6	Twenty-sixth

	exercis es		Technical expertise on the subject of unity		
Ongoin g assess ment	-1 Using number s and tools -2 Perfor ming exercis es	·Simplified design, winding installation, and testing of a single- output crane transformer ·Simplified design, winding installation, and testing of a three- output crane transformer	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	Twenty- seventh
Ongoin g assess ment	-1 Using number s and tools -2 Perfor ming exercis es	Study of the components of a split- ·phase motor, its operating theory mechanical and electrical faults and their repair methods, and how .to reverse the direction of rotation	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	Twenty- eighth
Ongoin g assess ment	-1 Using number s and tools -2 Perfor ming exercis es	Diagram the electrical circuit for ·the starting and running windings including how to connect the centrifugal switch and capacitor (if present). Wind the running and starting windings and secure them in the slots. Connect and test the .windings and start the motor	Using –1 equipment and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity	6	Twenty- ninth
Ongoin g	-1 Using number	Disassembling, assembling, and studying the components of battery trucks and troubleshooting potential malfunctions	Using –1 equipment	6	thirty

assessment	skills and tools -2 Performing exercises	Training in oxyacetylene and liquefied gas welding	and tools in the workshop Acquiring –2 skills Technical expertise on the subject of unity		
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11- Infrastructure:

Laboratory notebook for each workshop	1.Required textbooks
Winding electric motors, Dr. Qamar -1 Reference in electrical transformers -2SA Sticant , Franklin Electronics in the Service of Electrical .3 Applications. Noel M. Morris	2.Main references (sources)
Troubleshooting and maintenance of .1 electrical machinery. Prepared by the World .Bank for technical illustrations Principles and Maintenance of Transistor -2 Circuits, by Larson	a) Recommended books and references (scientific journals, reports, etc).
Technical Institute/ Rumaytha website websites of international companies	b) Electronic references, websites...

12-Curriculum Development Plan:

1– Participating in the various courses related to the subject to give the workshop trainers greater experience. 2– To learn about the latest advancements in modern technology in the field of maintenance and repair of electrical appliances. 3– Preparing courses that develop the ability of trainers in workshops to train students more efficiently. 4– Providing workshops with modern equipment and devices that keep pace with scientific development in developed countries.

5- Mathematics :

Teaching the student simple mathematical laws and equations and their applications in the field of solving and calculating electrical circuits.

Al-Furat Technical Institute/ Al-Rumaytha Middle Technical University	1-Educational institution
Electrical Engineering Department	2- Scientific Department/ Center
/ Mathematics RELEC1005	3-Course Name/Code
Daily attendance is mandatory	4- Available forms of attendance
(First semester + Second semester)/ First year	5-Term / Year
hours (total) 60	6- Number of study hours (total)
2025/10/15	7- Date this description was prepared
: Course Objectives -8	
1) Understanding simple mathematical laws and equations.	
2) Understanding key concepts, knowing the rules and laws of mathematics, and applying them to electrical technologies.	
3) The subject of mathematics aims to teach. The aim is to clarify the practical and philosophical challenges of current engineering mathematics that have spurred this ongoing development, as well as to present the fundamental concepts of differential and integral calculus useful for further study of engineering science and applied mathematics in the scientific and practical fields.	
4) Students acquire the skills to solve problems.	

9- Course outcomes , teaching and learning methods, and assessment :

A- Cognitive objectives:

The student will be able to :

A1- Understands the basic principles of linear algebra and its applications.

A2- Understands algebraic and transcendental functions, domains, codomains of algebraic and trigonometric functions, and limits of algebraic and trigonometric functions.

A3- Understands the rules and applications of differentiation.

A4- Understands the rules of function integration for algebraic and transcendental functions and the relationship between differentiation and integration.

A5- Understands the numerical methods of integration with their applications .

A6- Understands ordinary differential equations and methods for finding the general and special solutions with applications.

A7- The complex number is understood in its algebraic and coordinate forms, as well as the arithmetic operations performed on it, powers, and roots. With its applications.

A8- Understands the principles of descriptive statistics .

B - The specific skills objectives of the course:

B1 - Familiarity with the mathematical relationships that represent the types of algebraic functions and their graphing.

B2 - Familiarity with the laws of finding the derivative using the definition and reducing it to the basic function under the influence of the properties of integration.

B3-Using mathematical concepts and rules in the field of electrical power.

B4- Designing mathematical equations to solve practical problems in the physical and engineering fields.

B5- Preparing the technician to be a successful technician by learning the correct principles of electrical engineering specialization and applying mathematical relationships in solving problems in the field of work.

Teaching and learning methods:

1-Delivering lectures according to the pre-prepared educational package .

2- Allocate the last quarter of the lecture for discussion and conducting an exercise in which all students participate.

3- Weekly homework, which the student is responsible for completing.

Evaluation methods :

- Students are assessed individually by allowing them to participate in class by answering questions.
- Students are assessed collectively through daily exams with theoretical questions.
- Evaluate students collectively by assigning extracurricular tasks.
- Exams for the first and second semesters and final exams for the first and second rounds.

C- Affective and value-based objectives:

C1- Analyzing the structure of equations or mathematical objects according to the concepts studied by the student.

C2-Using logical proof methods and developing the value of truthfulness .

C3- integrate knowledge in terms of utilizing Encouraging the student to mathematical information in other theoretical and practical study fields and other the dependence of study materials on each.

C4- acquire growing skills in mathematics in terms Encouraging the student to methods. Analyzing the of language, symbols, information, and thinking results of solving problems and comparing them mentally with reality, and the extent to which they match.

Teaching and learning methods:

1- Developing students' ability to discuss and arrive at the most suitable solutions to problems and exercises. Through brainstorming and discussion management by the instructor.

2- Giving students extracurricular assignments that require them to demonstrate skills and provide self-explanatory interpretations through testing methods.

3-Developing the student's ability to analyze and draw theoretical conclusions .

4- Developing the student's ability to connect mathematical topics to sensory reality and their applications in public life.

Evaluation methods:

1- Testing students' ability to understand and then memorize definitions of mathematical concepts, rules, and theorems through direct questions during the lecture.

2- Testing the students' ability to think logically and link the premises of the problem with the methods of solving it provided by the laws and rules through questions prepared to measure this, directed to the student orally or in writing.

D - General and transferable skills (other skills related to employability and personal development) :

D1- Encouraging students to connect the mathematical vocabulary they study with the needs of society.

D2- Encouraging the student to study a variety of questions that present different cases within the same topic in order to broaden his horizons and consolidate his awareness and understanding of the subject matter.

D3- Enabling students to engage in continuous self-development after graduation .

D4- Developing the student's ability to analyze information and interpret data obtained through conducting practical experiments.

D5-Encouraging students to link computer use with the needs of society.

Teaching and learning methods

1. Preparing and implementing research and projects by students within the scope of the department's courses, incorporating applications of mathematics into them, and presenting them at annual student conferences.
2. Developing and updating the vocabulary of mathematics to keep pace with developments in a way that achieves personal development for students' level.

Assessment methods

1. Research and projects are discussed by scientific committees in the department.
2. Written tests.
3. Direct observations.

10- Course structure:

Evaluation Method	Teaching method	Unit/Topic Name	Required learning outcomes	Hours	Week
Discussion and solving exercises , quick quiz, homework	Theoretical lecture	Matrices / Determinants / and their properties	The student understands the lesson	Two hours	1
Discussion and solving exercises , quick quiz, homework	Theoretical lecture	– Solving linear equations – Cramer's method Applications of determinants – Using the substitution method to find the current values in a multi-source electrical circuit	The student understands the lesson	Two hours	2
Discussion and solving exercises , quick quiz, homework	Theoretical lecture	Vectors / Vector Analysis / Vector and Scalar Quantities / Vector Algebra / Vector Calculations in Space Phase and vector representation of alternating quantities, phase angle – finding the resultant of vector quantities	The student understands the lesson	Two hours	3
Discussion and solving exercises , quick quiz, homework	Theoretical lecture	Orthogonal Vector Unit / Vector Scale / Dot and / Cross Product / Applications of Vectors Magnetic Flux / Maxwell / Scalar Product of Vectors Using Angles / Scalar Product of Vectors Using Coordinates	The student understands the lesson	Two hours	4
Discussion and solving exercises , quick quiz, homework	Theoretical lecture	Function / Trigonometric Functions and Trigonometric Relationships / Logarithmic Functions Calculating the DC current value for a half-bridge / circuit / Calculating the effective voltage value Transistor load line	The student understands the lesson	Two hours	5

Discussion and solving exercises , quick quiz, homework	Theoretic al lecture	/ Exponential Function / Hyperbolic Functions Applications of graphing exponential functions for a first-order electrical circuit, representation of an RC filter circuit using an exponential function	The student understand s the lesson	Two hours	6
Discussion and solving exercises , quick homework . quiz	Theoretic al lecture	Limits / Limits of algebraic and trigonometric functions / Applications of limits	The student understand s the lesson	Two hours	7
Discussion and solving exercises , quick homework . quiz	Theoretic al lecture	Differentiation / Derivative / Derivative of algebraic functions / Chain rule – Constructing a differentiating circle / Calculating velocity and acceleration	The student understand s the lesson	Two hours	8
Discussion and solving exercises , quick homework . quiz	Theoretic al lecture	Implicit function / Higher-order standard derivative function / Representing a physical system using an implicit function	The student understand s the lesson	Two hours	9
Discussion and solving exercises , quick homework . quiz	Theoretic al lecture	Derivative of trigonometric functions / Derivative of logarithmic functions / Calculating the effective current in anRLC circuit Voltage gain in pi /	The student understand s the lesson	Two hours	10
Discussion and solving exercises , quick homework . quiz	Theoretic al lecture	Derivative of exponential functions / Derivative of hyperbolic functions / Calculating the time constant	The student understand s the lesson	Two hours	11
Discussion and solving exercises , quick homework . quiz	Theoretic al lecture	Applications of the derivative / Equation of the / tangent and normal / Velocity and acceleration Change Calculations of the rate of change of voltage and current as a function of time	The student understand s the lesson	Two hours	12
Discussion and solving exercises , quick homework . quiz	Theoretic al lecture	Increasing and decreasing values / Maximum and minimum values / Inflection points / Graphing functions RLC response diagram for a second-order circuit	The student understand s the lesson	Two hours	13
Discussion and solving exercises , quick homework . quiz	Theoretic al lecture	General physics and engineering applications	The student understand s the lesson	Two hours	14
Discussion and solving exercises, quick homework , quiz	Theoretic al lecture	Integration / Indefinite Integration / Integration of Algebraic and Logarithmic Functions. Calculating .the value of a capacitor charge	The student understand	Two hours	15

			s the lesson		
Discussion and solving exercises, quick homework , quiz	Theoretic al lecture	Integration of exponential and trigonometric functions	The student understand s the lesson	Two hours	16
Discussion and solving exercises, quick homework , quiz	Theoretic al lecture	Definite integral / Applications of definite integrals Area under a curve / Area between two curves / Electrical power calculations /	The student understand s the lesson	Two hours	17
Discussion and solving exercises, quick homework , quiz	Theoretic al lecture	Volumes of rotation / Arc length of the curve	The student understand s the lesson	Two hours	18
Discussion and solving exercises, quick homework , quiz	Theoretic al lecture	– Physical and engineering applications (work (torque – momentum – moment of inertia	The student understand s the lesson	Two hours	19
Discussion and solving exercises, quick homework , quiz	Theoretic al lecture	General methods in integration include ,substitution, partitioning, and the use of partial ,exponential, and logarithmic fractions Building an integer circuit using a resistor and an inductor / Representing an electrical circuit using integral equations / An amplifier circuit using an integrated circuit	The student understand s the lesson	Two hours	20
Discussion and solving exercises, quick homework , quiz	Theoretic al lecture	Numerical methods in integration / Trapezoidal rule / Simpson's rule Finding the distance from the acceleration and velocity , finding the effective current value of a power rectifier	The student understand s the lesson	Two hours	21
Discussion and solving exercises, quick homework , quiz	Theoretic al lecture	Solving discrete, homogeneous, and linear differential equations with their various / applications within the field of specialization Positive, negative, and complex pruning circuits	The student understand s the lesson	Two hours	22
Discussion and solving exercises, quick homework , quiz	Theoretic al lecture	,Complex numbers / Addition, subtraction multiplication, and division / Geometric representation of complex numbers / The relationship of electrical units to complex numbers	The student understand s the lesson	Two hours	23
Discussion and solving exercises, quick homework , quiz	Theoretic al lecture	Polarization / Converting algebraic properties to polarity and vice versa / The sign of the coefficient)j in electronic circuits / The exponential formula (in transformations / De Monese's theorem and its applications in solving complex electrical circuits	The student understand s the lesson	Two hours	24

		Calculations of power transmission lines using / line constants			
Discussion and solving exercises, quick homework ' quiz	Theoretic al lecture	Forces and Roots / Drawing Roots / Finding Roots for Electrical Circuits to Determine Stability Star and Delta Representations /	The student understand s the lesson	Two hours	25
Discussion and solving exercises, quick homework ' quiz	Theoretic al lecture	/ Statistical operations / Frequency distributions Histogram / Frequency curve / Probability and range / Arithmetic and geometric mean – Sample	The student understand s the lesson	Two hours	26
Discussion and solving exercises, quick homework ' quiz	Theoretic al lecture	/ Arithmetic mean / Range / Standard deviation Variance, dispersion, and ratio / Relationship between mean, median, and mode / Coefficient of variation – standard variable	The student understand s the lesson	Two hours	27
Discussion and solving exercises, quick homework ' quiz	Theoretic al lecture	Matrices / Determinants / and their properties	The student understand s the lesson	Two hours	28
Discussion and solving exercises, quick homework ' quiz	Theoretic al lecture	– Solving linear equations – Cramer's method Applications of determinants – Using the substitution method to find the current values in a multi-source electrical circuit	The student understand s the lesson	Two hours	29
Discussion and solving exercises, quick homework ' quiz	Theoretic al lecture	Vectors / Vector Analysis / Vector and Scalar Quantities / Vector Algebra / Vector Calculations in Space Phase and vector representation of alternating quantities, phase angle – finding the resultant of vector quantities	The student understand s the lesson	Two hours	30

11- Infrastructure:	
The institute's library provides additional resources for the curriculum.	1.Required textbooks
George B. Thomas, Jr., "Thomas' Calculus", 12th edition, Addison Wesley, Pearson Education, Inc, 2010.	2.Main references (sources)
All reputable scientific journals that deal with the broad concept of mathematics and spherical triangles	a) Recommended books and references (scientific journals, reports, etc).

Websites related to mathematics and spherical triangles	b) Electronic references, websites...
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12-Curriculum Development Plan:
Keeping up with developments and introducing computer programs and applications in mathematics, triangles, and matrices.

6 -Computer Applications) 1(:

Teaching the student: Computer basics, operating system and important commands , the concept of viruses and how to deal with them.

Technical Institute/ Al-Rumaytha - Al-Furat University, Middle Technical University	1-Educational institution
Electrical Engineering Department	2-Scientific Department / Center
/ Computer Applications 1RELEC1006	3-Course Name/Code
Daily attendance is mandatory	4-Available forms of attendance
(First semester + Second semester)/ First year	5-Term / Year
60 hours (total)	6-Number of study hours (total)
2025/10/15	7- Date this description was prepared

8-Course Objectives

1. Teaching the student the basics of computers, the operating system, and the most important commands.
2. Teaching the student to access the AutoCAD drawing program and become familiar with the drawing interface and drawing and editing commands.
3. Accessing 3D drawing.
4. Teaching students the concept of viruses and methods of combating them.

9-Course outcomes , teaching and learning methods, and assessment

A- Cognitive objectives:

A1- Introducing the student to the basics of computers, the operating system, and the most important commands.

A2– Introducing the student to the AutoCAD drawing program and familiarizing them with the drawing interface and drawing and editing commands, 3D drawing.

A4– Introducing the student to viruses and methods of combating them .

B - The specific skills objectives of the course:

B1 – Acquiring the skill of using computers and their various programs

B2 – Acquiring 3D drawing skills

B3 – Acquiring some skills in the AutoCAD program

B4 – Acquiring skills in identifying types of viruses and methods of combating them

Teaching and learning methods :

1. Theoretical lectures and practical applications
2. presentations

Evaluation methods:

1. Students are assessed individually by giving them the opportunity to participate in class by answering questions.
2. Students are assessed collectively through daily exams with practical and theoretical questions.
3. Students are assessed collectively by being given extracurricular assignments such as writing personal reports or those related to practical experiments in laboratories.
4. Exams for the first and second semesters and final exams for the first and second rounds.

:C- Affective and value-based objectives

C1- Analyzing computer architecture and software according to the concepts studied by the student.

C2–Using logical proof methods and developing the value of truthfulness.

C3– integrate knowledge in terms of utilizing Encouraging the student to computers and their applications in various fields. Other studies include theoretical and practical aspects, and the dependence of study materials on each.

C5– acquire growing skills in computer applications Encouraging the student to in. Analyzing the terms of language, symbols, information, and thinking methods results of solving problems and comparing them mentally with reality, and the extent to which they match.

Teaching and learning methods :

1. Homework
2. Theoretical lectures
3. Practical skills within the laboratory
4. Classroom discussion

Evaluation methods :

1. Direct oral questions
2. Daily quizzes
3. Midterm and final exams

D - General and transferable skills (other skills related to employability and personal development) :

D1–Encouraging students to link computer use with the requirements of society .

D– Encouraging the student to study diverse questions that present different cases within the same topic in order to broaden his horizons and consolidate his awareness and understanding of the subject matter.

D3– Enabling students to engage in continuous self–development after graduation.

D4– Developing the student’s ability to analyze information and interpret data obtained through conducting practical experiments.

Teaching and learning methods :

1. Preparing and implementing research and projects by students within the scope of the department's courses, incorporating computer applications into .them, and presenting them at annual student conferences
2. Developing and updating the vocabulary of the Computer Applications course to keep pace with developments in a way that achieves personal .development for the students' level

Assessment methods:

1. Research and projects are discussed by scientific committees in the department.
2. Written tests.
3. Direct observations.

Course structure -10

Evaluation Method	Teaching method	Unit/Topic Name	Required learning outcomes	Hours	Week
Direct assessment written + and practical exams	Theoretical lectures + practical application	An introduction to computers and their benefits, their generations, how to connect computer parts, and computer components. Hardware and ,input/output devices, software memory measurement units, file and folder definitions	Understanding the subject of unity	6	+ First Second
Direct assessment written + and practical exams	Theoretical lectures + practical application	Windows 7 , operating system system advantages, basic requirements For operation, the components of the desktop screen the concept of an ,icon how to , handle mouse actions, the importance and components of the taskbar and using ,the Start button to access programs. Exit the system and turn it off Calculator	Understanding the subject of unity	6	+ Third Fourth
Direct assessment written + and	Theoretical lectures + practical	Understanding the window and :identifying its main components working with the COMPUTER ,MY DOCUMENTS ,RECYCLE BIN	Understanding the subject of unity	6	Fifth + Sixth

practical exams	applicati on	icons ,copying files and folders , and cutting and pasting			
Direct assessment written + and practical exams	Theoreti cal lectures + practical applicati on	File, folder, and disk properties change desktop background Desktop background change window , colors, screensaver	Understan ding the subject of unity	6	+ Seventh Eighth
Direct assessment written + and practical exams	Theoreti cal lectures + practical applicati on	Learn about theControl Panel mouse , properties, programs and theirfeatures and how to uninstall installed , programs. Also, learn about some accessoriessuch as theCalculator , WordPad and ,Windows Media Player .for playing video files	Understan ding the subject of unity	6	+ Ninth Tenth
Direct assessment written + and practical exams	Theoreti cal lectures + practical applicati on	AutoCAD ,program : Definition ,importance, installation, operation familiarization with the program interface and how to access commands, creating a new file, saving and opening files, helper commands (DRAWING LIMITS ,UNITS)	Understan ding the subject of unity	3	eleventh
Direct assessment written + and practical exams	Theoreti cal lectures + practical applicati on	:CommandsOSNAP ,ORTTHO ,LWT ,OTRACK ,POLAR ,SNAP ,GRID , DISTANCE ,AREA	Understan ding the subject of unity	3	twelfth
Direct assessment written + and practical exams	Theoreti cal lectures + practical applicati on	Viewing : toolsZoom command, Pan , commandRegen command	Understan ding the subject of unity	3	thirteenth

Direct assessment written + and practical exams	Theoretical lectures + practical application	Basic drawing commands: LINE , MULTILINE, CONSTRUCTIONLINE , POLYLINE , POLYGON , RECTANGLE , ARC , CIRCLE , DONUT , REVCLLOUD , SPLINE , ELLIPS , MACKE BLOCK , INSERT BLOCK , MBLOCK , WBLOCK , HATCH , REGION	Understanding the subject of unity	9	Fourteenth Fifteenth + Sixteenth +
Direct assessment written + and practical exams	Theoretical lectures + practical application	Modify : commands ERASE , COPY , MIRROR , OFFSET , ARRAY , MOVE , ROTATE , SCALE , CHAMFER , FILLET , STRETCH , TRIM , EXTEND , BREAK , EXPLODE	Understanding the subject of unity	6	Seventeenth + Eighteenth
Direct assessment written + and practical exams	Theoretical lectures + practical application	Text writing commands and their :modification Multiline Text , Single Line Text how to create new , text styles familiarization with the Design , Center and utilizing ready-made .electrical templates	Understanding the subject of unity	6	Nineteenth Twentieth +
Direct assessment written + and practical exams	Theoretical lectures + practical application	:Dividing commands MEASURE , DIVIDE Controlling drawing :specifications LINETYPE , LINE WEIGHT , COLOR Modifying :drawing properties using PROPERTIES , MATCH PROPERTIES , GRIPS	Understanding the subject of unity	6	Twenty-first Twenty- + second
Direct assessment written + and practical exams	Theoretical lectures + practical application	Dimensions	Understanding the subject of unity	3	Twenty-third
Direct assessment written + and practical exams	Theoretical lectures + practical application	Introduction to 3D drawing, features of , 3D drawing, types of 3D drawing understanding the ELEV and THICKNESS commands	Understanding the subject of unity	3	Twenty- fourth

	applicati on				
Direct assessment written + and practical exams	Theoreti cal lectures + practical applicati on	Previewing 3D drawings using 3DVIEW splitting the 3D drawing , screen usingVPORST , and the UCS . user coordinate system	Understan ding the subject of unity	6	Twenty-fifth Twenty- + sixth
Direct assessment written + and practical exams	Theoreti cal lectures + practical applicati on	Creating 3DSurfaces Creating 3DSolids	Understan ding the subject of unity	6	Twenty- + seventh Twenty- eighth
Direct assessment written + and practical exams	Theoreti cal lectures + practical applicati on	The concept of computer viruses, the motives for virus spread, how to become infected with a virus, types of viruses according to the nature of the infection and the damage they cause signs of computer virus infection precautions to take to prevent viruses from entering computers, and how to .use antivirus software	Understan ding the subject of unity	6	Twenty- + ninth Thirtieth

11- Infrastructure

Textbooks	1-Required textbooks
References related to the subject and available at the Institute's library	2-Main references (sources)
Books and magazines related to computer topics: basics, applications, usingAutoCAD ,viruses.	a) Recommended books and references (scientific journals, reports, etc).
The institute's website, various internet resources, and global company websites.	b) Electronic references, websites...

12-Curriculum Development Plan

Participating in various computer- related courses

- 1- Accessing the latest advancements in computer technology applications
- 2- Conducting development courses for laboratory staff that enhance their ability to train students more efficiently.
- 3- Equipping laboratories with modern equipment that keeps pace with scientific developments in developed countries

7-Engineering and electrical drawing :

Teaching the student the basics and rules of engineering and drawing, as well as the use of the AutoCAD program on the computer in engineering drawing and in drawing electrical diagrams and circuits.

- Middle Euphrates Technical University Technical Institute / Al-Rumaytha	1-Educational institution
Electrical Engineering Department – First Year	2- Scientific Department/ Center
/ Engineering and Electrical Drawing RELEC1007	3-Course Name/Code
Mandatory daily attendance	4- Available forms of attendance
(First semester + Second semester)/ First year	5-Term / Year
hours 90	6- Number of study hours (total)
2025/10/15	7- Date this description was prepared
8-Course Objectives	
1. engineering and This course aims to demonstrate the importance of studying electrical drawing.	

- | | |
|--|---|
| 2. familiarity student | Based on the principles and rules of engineering and electrical drawing that benefit him in His study His and specialization professional life. |
| 3. He is student | Able to construct his imagination around the subject of the drawing. |
| 4. The student will be able to understand the rules and theories of engineering. | |
| 5. The student is able to achieve speed through alertness, frequent practice, and following the correct methods. | |
| 6. The student uses computer software in engineering and electrical drawing. | |
| 7. Learning electrical symbols and drawing various electrical diagrams. | |

9- Course outcomes , teaching and learning methods, and assessment:

A- Cognitive objectives:

- A1– To become familiar with the basic concepts of engineering and electrical drawing and the ability to use them correctly.
- A2– Expanding students’ knowledge and increasing their practical skills in the field of using AutoCAD software.
- A3– The student is able to learn the engineering principles of engineering drawing and how to master drawing.
- A4– The student is able to draw different electrical circuits using AutoCAD software.
- A5– The student learns about the symbols used in electrical diagrams and circuits.

B - The specific skills objectives of the course:

- B1– The student will acquire the skill of using AutoCAD software in engineering and electrical drawing.
- B2– The student will acquire the skill of using AutoCAD commands: drawing commands, modification commands, text addition commands, and dimension addition commands. As well as methods of exiting these commands.

B3– The student acquires the skill of converting drawings from two–dimensional to three–dimensional.

B4– The student acquires the skill of drawing regular geometric objects using the grid command.

B5– The student acquires the skill of using the electrical symbols found in the design center, and the skill of drawing symbols not found in the program.

B6– Acquiring the skill of drawing projections from the model and determining the directions of looking at the object. The student also invests his knowledge in making decorations that can be applied in various industries.

Teaching and learning methods

1. Theoretical lecture
2. Solving practical exercises on a calculator
3. Showing explanatory films along with the lecture
4. Using visual display devices
5. Giving daily homework

Assessment methods

1. Students are assessed individually by giving them the opportunity to participate in class by answering questions.
2. Students are assessed collectively through daily exams with practical and theoretical questions.
3. Students are assessed collectively by giving extracurricular assignments such as special drawings or those related to practical experiments in laboratories.
4. End-of-first-semester (mid-year) and second-semester final exams, and final exams for the first and second rounds.

C- Affective and value-based objectives:

C1– Urging the student to integrate knowledge in terms of utilizing the computer and its applications in engineering and electrical drawing and the need for this in other academic fields.

C2– Encouraging the student to acquire growing skills in the subject of computer drawing applications in terms of language, symbols analyzing the results of solving information, thinking methods problems, mentally comparing them with reality, and the extent to which they match.

C3– Analyzing the results and comparing them mentally with reality and the extent to which they match the values of the three-dimensional shape design.

Teaching and learning methods

1. Creating illustrative three-dimensional shapes.
2. Showing explanatory films.
3. Solve practical exercises for each case.
4. Field observations, for example, buildings and drawing them in AutoCAD (field visits).
5. Drawing electrical circuits in AutoCAD.

Assessment methods

- 1– short daily quizzes
- 2– Homework
- 3– Midterm and final exams

D - General and transferable skills (other skills related to employability and personal development):

D1– To enable students to master engineering drawing in its practical and theoretical aspects.

D2– Developing the student's ability to imagine three-dimensional shapes in determining the three dimensions of geometric objects.

D3– Enabling the student to place the dimensions in a good and correct manner.

D4– Enabling the student to draw regular geometric shapes.

D5– Enabling the student to draw electrical distribution maps.

Teaching and learning methods

1. Preparing and implementing demonstration experiments by students within the curriculum of Engineering and Electrical Drawing.
2. Student training (summer training) at relevant government institutions such as (the Planning Department).
Al–Omrani) to help students acquire sufficient skills and prepare them well for employment.
3. Developing and updating the vocabulary of engineering drawing to keep pace with developments in a way that achieves personal development for the students' level.

Assessment methods

1. Discussion of the results of practical experiments and projects by scientific committees in the department.
2. Written tests.
3. Direct observations.

Course structure -10

Evaluation Method	Teaching method	Unit/Topic Name	Required learning outcomes	Hours	Week
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	The importance of engineering .drawing Getting acquainted with the .AutoCAD program interfaces Methods for executing AutoCAD commands, and methods for exiting .them Navigating between interfaces showing menus, showing and hiding .bars	Student's ability to use unit applications	3	the first
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Methods of drawing a straight line using the Cartesian coordinate method, the relative method and the .polar method	Student's ability to use unit applications	3	the second
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Display commands, workspace dimensions, drawing boundaries and units, save the file, then it can be opened in a previous version of the program using the following :commands (Zoom, drawing Limits, Units, Options)	Student's ability to use unit applications	3	the third
Exercise assessment +	Lectures + Practical Computer	Drawing accuracy commands SNAP, GRID, ORTHO, POLAR, OSNAP, OTRACK, DUCS, DYN, LWT (	Student's ability to use unit applications	3	Fourth

midterm and final practical exams	Exercise s	Drawing objects isometrically using the GRID command			
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercise s	:Commands for drawing elements (Rectangle, Circle, Polygon, Arc, Ellipse, Donut, Wipeout, Revision Cloud)	Student's ability to use unit applications	3	Fifth
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercise s	Modification commands (Erase, Copy, Move, Mirror, Offset, Scale, Stretch, Rotate)	Student's ability to use unit applications	3	Sixth
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercise s	Set and control different dimensions on drawing elements using the .Dimension Style dialog box Linear, Aligned, Arc Length , Radius, Diameter, Angular, Baseline, Continue, -Mleader , Dimension Style...	Student's ability to use unit applications	3	Seventh
Exercise assessment + midterm	Lectures + Practical Computer	Controlling drawing specifications line types, element colors, their properties and transferring properties to another element (Match Properties) (	Student's ability to use unit applications	3	Eighth

m and final practi cal exam s	Exercise s				
Exerci se asses sment + midterm and final practi cal exam s	Lectures + Practical Comput er Exercise s	Commands for drawing other key elements (Polyline, Point, Spline, Helix, Table)	Student's ability to use unit applications	3	Ninth
Exerci se asses sment + midterm and final practi cal exam s	Lectures + Practical Comput er Exercise s	:Other modification commands (Array, Trim, Extend, Break, Fillet, Chamfer, Explode, Align)	Student's ability to use unit applications	3	tenth
Exerci se asses sment + midterm and final practi cal exam s	Lectures + Practical Comput er Exercise s	AddingSingle Line & Multiline Text , its methods and control of its specifications	Student's ability to use unit applications	3	11
Exerci se asses sment + midterm	Lectures + Practical Comput er		Student's ability to use unit applications	3	12

and final practical exams	Exercise s				
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercise s	Calculate areas, volumes, distances, ID points, and item specifications using the Inquiry command. Working with Parametric Toolbar Commands	Student's ability to use unit applications	3	13
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercise s	Hatching, gradient, and sectors	Student's ability to use unit applications	3	14
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercise s	Layers and .controlling their settings	Student's ability to use unit applications	3	15
Exercise assessment + midterm and	Lectures + Practical Computer Exercise s	Blocks , their types, insertion, and .control of their specifications	Student's ability to use unit applications	3	16

final practical exams					
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Converting a drawing from 2D to 3D commands (Region, Boundary, Join)	Student's ability to use unit applications	3	17
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	surfaces and objects Basic 3D Shapes Commands (Box, Wedge, Cone, Sphere, Cylinder, Tours, Pyramid)	Student's ability to use unit applications	3	18
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Commands for creating 3D objects (Extrude, Press/pull, Polysolid , Union, Subtract, Intersect, Revolve, Sweep, Loft)	Student's ability to use unit applications	3	19
Exercise assessment + midterm and final	Lectures + Practical Computer Exercises	Commands for modifying objects (Shell, Separate, Slice, Thicken) Working with UCS (Unified Communication System) commands	Student's ability to use unit applications	3	20

practical exams					
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Drawing projections, using program commands to display the projection	Student's ability to use unit applications	3	21
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Printing	Student's ability to use unit applications	3	22
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Drawing electrical circuits Use the program's library to use the symbols found in the Design Center. Drawing symbols not found in the program Save the symbols in a separate file .for use in new files	Student's ability to use unit applications	3	23
Exercise assessment + midterm and final practical	Lectures + Practical Computer Exercises	Drawing some electrical and electronic circuits Drawing sinusoidal input/output waves or any other waveform	Student's ability to use unit applications	3	24

cal exam s					
Exerci se asses sment + midter m and final practi cal exam s	Lectures + Practical Comput er Exercise s	Diagram of a motor's operating and .control circuit	Student's ability to use unit applications	3	25
Exerci se asses sment + midter m and final practi cal exam s	Lectures + Practical Comput er Exercise s	An example of the foundations of a .small building or residential house	Student's ability to use unit applications	3	26
Exerci se asses sment + midter m and final practi cal exam s	Lectures + Practical Comput er Exercise s	Drawing models of cabletrays .	Student's ability to use unit applications	3	27
Exerci se asses sment + midter m and final practi cal	Lectures + Practical Comput er Exercise s	The importance of engineering .drawing Getting acquainted with the .AutoCAD program interfaces Methods for executing AutoCAD commands, and methods for exiting .them	Student's ability to use unit applications	3	28

exam s		·Navigating between interfaces showing menus, showing and hiding .bars			
Exerci se asses sment + midterm and final practi cal exam s	Lectures + Practical Comput er Exercise s	Methods of drawing a straight line using the Cartesian coordinate method, the relative method and the .polar method	Student's ability to use unit applications	3	29
Exerci se asses sment + midterm and final practi cal exam s	Lectures + Practical Comput er Exercise s	Display commands, workspace dimensions, drawing boundaries and units, save the file, then it can be opened in a previous version of the program using the following :commands (Zoom, drawing Limits, Units, Options)	Student's ability to use unit applications	3	30

Infrastructure - 11

Methodological vocabulary	Required textbooks .1
References available in the Institute's library	Main references (sources) .2
Various journals specializing in computer -1 applications Electrical installation diagrams -2	a) Recommended books and ·references (scientific journals (.reports, etc
Institute website, internet resources, global company websites	·b) Electronic references ...websites

12-Curriculum Development Plan

- 1- Participating in various computer applications courses In engineering and electrical drawing, to provide a skilled technical staff.
- 2- To learn about the latest advancements in computer graphics software.
- 3- Providing high-performance computers.

8-Human rights and democracy:

To learn about and promote the principles and values of human rights and the principles of democracy, and to educate future generations to respect, adhere to, and act upon them

- Middle Euphrates Technical University Technical Institute / Al-Rumaytha	1-Educational institution
– Electrical Engineering Department First Year	2- Scientific Department/ Center
/ Human Rights and Democracy RELEC1008	3-Course Name/Code
Mandatory daily attendance	4- Available forms of attendance
(First semester + Second semester)/ First year	5-Term / Year
hours 60	6- Number of study hours (total)
2025/10/15	7- Date this description was prepared
8- Course Objectives:	
1– To learn about and promote the principles and values of human rights, and to educate future generations to respect, adhere to, and act upon them.	

2– To learn about and promote the principles of democracy, and to educate future generations to respect, adhere to, and implement them.

9- Course outcomes , teaching and learning methods, and assessment:

A - Cognitive objectives:

A1 – Defining the principles of human rights in international conventions and regional and national legislation.

A2 – Defining the work of international, regional and national humanitarian organizations.

A3 – Defining the principles of human rights in the Iraqi constitutions that were issued in Iraq at different time periods.

B - The specific skills objectives of the course:

B1 – Transforming cognitive goals into reality as much as possible .

B2 – That the student's behavior should change to one of respecting the rights of others during his daily practices.

B3 – The student is obligated to apply the laws and regulations relating to respecting the rights of others and respecting other religions.

Teaching and learning methods:

1–Theoretical lectures

2– Discussing the concepts presented in the lecture with the participation of the students.

3– Giving examples of the application of human rights in developed countries in this field.

4– Assigning students to complete special research in the field of human rights and democracy.

Evaluation methods :

1. Students are assessed individually by giving them the opportunity to participate in class through discussion and answering questions.
2. Students are assessed collectively through daily exams with theoretical questions.
3. Evaluate students collectively by assigning extracurricular tasks.
4. Exams for the first and second semesters and final exams for the first and second rounds.

C- Affective and value-based objectives:

C1– Dealing with others in a spirit of cooperation, respecting them, and offering a helping hand.

C2– Encouraging the student to work as a team in his work environment or within the same family.

C3– Respecting others and not mocking or controlling their different customs and traditions.

Teaching and learning methods :

1. Weekly lecture
2. Presenting honorable examples and models from everyday life and world stories.

Evaluation methods :

- 1–Daily assessment
- 2– Observing the student's behavior while dealing with his peers and guiding him to apply emotional values.

D - General and transferable skills (other skills related to employability and personal development):

- 1– To accustom the student to integrating into the work environment and providing appropriate assistance.
- 2– Motivating the student to keep up with the latest developments in his field of work.

3- Developing and refining the student's capabilities through participation in development courses Different.

Teaching and learning methods:

1. Lecture
2. Giving examples of the application of human rights in developed countries in this field.
3. Students are assigned to complete special research projects in this field.

Evaluation methods:

1. Daily assessment through direct questions within the lecture.
2. Surprise exams during the lecture.
3. Term exams.
4. Final exams.

10- Course structure:

Evaluation Method	Teaching method	Unit name	Required learning outcomes	Hours	Week
،Discussion quick quiz	Theoretical lecture	– Human rights – definition .objectives	Student understanding of the lesson	2 Theory	the first
،Discussion quick quiz	Theoretical lecture	The roots and development of – human rights in human history human rights in ancient and .medieval times	Student understanding of the lesson	2 Theory	the second
،Discussion quick quiz	Theoretical lecture	Human rights in ancient civilizations, especially the .civilization of Mesopotamia	Student understanding of the lesson	2 Theory	the third

«Discussion quick quiz	Theoretical lecture	«Human rights in divine laws with a focus on human rights in .Islam	Student understanding of the lesson	2 Theory	Fourth
«Discussion quick quiz	Theoretical lecture	Human rights in the Middle Ages – Human rights in political doctrines, schools and theories Human rights in companies – «and their declarations revolutions and constitutions English documents – American) Revolution – French Revolution .(Russian Revolution –	Student understanding of the lesson	2 Theory	Fifth
«Discussion quick quiz	Theoretical lecture	Human rights in contemporary – and modern history International recognition of human rights since World War I .and the League of Nations	Student understanding of the lesson	2 Theory	Sixth
«Discussion quick quiz	Theoretical lecture	Regional recognition of human rights – European Convention – on Human Rights 1950 American Convention on Human Rights 1969 – African Charter on Human Rights 1981 Arab Charter on Human – .Rights 1994	Student understanding of the lesson	2 Theory	Seventh

Discu «ssion quick quiz	Theor etical lecture	Non–governmental organizations and human rights (International Committee of the Red Cross .(Amnesty International – Human Rights Watch –	Student understa nding of the lesson	2 Theor y	Eighth
Discu «ssion quick quiz	Theor etical lecture	.National human rights organizations	Student understa nding of the lesson	2 Theor y	Ninth

Discu ssion quick quiz	Theor etical lecture	Human rights in Iraqi constitutions: between .theory and reality	Student understa nding of the lesson	2 Theor y	tenth
Discu ssion quick quiz	Theor etical lecture	The relationship between human rights and :public freedoms .In the Universal Declaration of Human Rights –1	Student understa nding of the lesson	2 Theor y	elevent h
Discu ssion quick quiz	Theor etical lecture	In regional charters and national –2 .constitutions	Student understa nding of the lesson	2 Theor y	twelfth
Discu ssion quick quiz	Theor etical lecture	Essential human rights and collective human .rights	Student understa nding of the lesson	2 Theor y	thirteen th
Discu ssion quick quiz	Theor etical lecture	Economic, social and cultural human rights, and .civil and political human rights	Student understa nding of the lesson	2 Theor y	fourtee nth
Discu ssion quick quiz	Theor etical lecture	– Modern human rights – Facts in development The right to a clean environment – The right to .solidarity – The right to religion	Student understa nding of the lesson	2 Theor y	fifteenth
Discu ssion quick quiz	Theor etical lecture	Guarantees for respecting and protecting human rights at the national level – guarantees in the constitution and laws – guarantees in the .principle of the rule of law	Student understa nding of the lesson	2 Theor y	Sixteen th

Discu ssion quick quiz	Theor etical lecture	– Guarantees in constitutional oversight Guarantees in freedom of the press and public opinion – The role of non–governmental organizations in respecting and protecting .human rights	Student understa nding of the lesson	2 Theor y	sevente enth
Discu ssion quick quiz	Theor etical lecture	Guarantees, respect and protection of human rights at the international level – the role of the United Nations, its organizations and specialized .agencies in providing guarantees	Student understa nding of the lesson	2 Theor y	eightee nth
Discu ssion quick quiz	Theor etical lecture	The role of regional organizations (Arab – – League – European Union – African Union .Organization of American States – ASEAN)	Student understa nding of the lesson	2 Theor y	ninete enth
Discu ssion quick quiz	Theor etical lecture	General theories of freedoms – The origin of – rights and freedoms – The project’s position on declared rights and freedoms – The use of the .term public freedoms	Student understa nding of the lesson	2 Theor y	Twenty
Discu ssion quick quiz	Theor etical lecture	The functional nature of the concept of public freedoms – philosophical considerations of functional rights – structural considerations of positive law – economic considerations and .public freedoms	Student understa nding of the lesson	2 Theor y	Twenty first–
Discu ssion quick quiz	Theor etical lecture	.The legal basis of the rule of law	Student understa nding of the lesson	2 Theor y	Twenty – second
Discu ssion quick quiz	Theor etical lecture	.The legal basis of the rule of law	Student understa nding of the lesson	2 Theor y	third –

„Discussion quick quiz	Theoretical lecture	Regulating public freedoms by .public authorities	Student understanding of the lesson	2 Theory	Twenty-fourth
„Discussion quick quiz	Theoretical lecture	Litigation or the non-judicial .system	Student understanding of the lesson	2 Theory	Twenty-fifth
„Discussion quick quiz	Theoretical lecture	– Judicial challenge determining the state's responsibility for its legitimate .actions	Student understanding of the lesson	2 Theory	Twenty-sixth
„Discussion quick quiz	Theoretical lecture	- The impact of the duality of the judiciary .on public freedoms - Public freedoms according to administrative .jurisprudence	Student understanding of the lesson	2 Theory	Twenty-seventh
„Discussion quick quiz	Theoretical lecture	Equality – The historical development of the concept of .equality	Student understanding of the lesson	2 Theory	Twenty-eighth
„Discussion quick quiz	Theoretical lecture	The modern development of .the idea of equality	Student understanding of the lesson	2 Theory	Twenty-ninth
„Discussion quick quiz	Theoretical lecture	- .Gender equality - Equality between individuals based on .their beliefs and race	Student understanding of the lesson	2 Theory	thirty

11-Infrastructure

Textbooks	1-Required textbooks
References related to the subject and available at the Institute's library	2-Main references (sources)
Books and magazines related to the topic of human rights and democracy	a) Recommended books and references (scientific journals, reports, etc).

The institute's website, various internet sources, websites of humanitarian .organizations and legal entities	b) Electronic references, websites...
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12- Curriculum Development Plan

- 1- Communication in developing the curriculum through full communication with the relevant legal authorities and civil society organizations.
- 2- Holding workshops for teaching the subject at the university level and other universities.

9- Occupational safety :

Teaching students the principles and rules of occupational safety to prevent accidents and injuries in workplaces.

Middle Euphrates University - Technical Institute / Al-Rumaytha	Educational institution -1
Electrical Engineering Department – First Year	2- Scientific Department / Center
Occupational safety	3-Course Name/Code
Mandatory daily attendance	4- Available forms of attendance
First semester/First year	5-Term / Year
hours (total) 30	6- Number of study hours (total)
2025/10/15	7- Date this description was prepared
8- Course Objectives:	
1) This course aims to demonstrate the importance of studying occupational safety.	

2) **familiarity student** Based on the principles and rules of occupational safety that benefit him in His study His professional life specialization and future.

3) **He is student** Able to know the general rules for preventing accidents and injuries during work.

4) **The student should be able to maintain vigilance and attention and follow proper procedures.**

9-Course outcomes , teaching and learning methods, and assessment

A- Cognitive objectives

A1- The student learns the basic principles of occupational safety .

A2- Expanding students' horizons and increasing their practical skills in the field of accident reduction.

A3- The student is able to take a comprehensive and clear picture of occupational safety.

A4- Enabling the student, through commitment and action in accordance with occupational safety concepts, to preserve lives and property in work sites.

B - The specific skills objectives of the course:

B1- Identifying the causes of electric shock and how to help the victim .

B2- Identifying the steps that must be followed to protect people from electric shock.

B3- Identifying the types of fire alarm systems and how they work.

B4 - Understanding how to act in the event of a fire at the work site.

B5 - Identifying personal protective equipment.

Teaching and learning methods:

1. a discussion of the concepts presented The theoretical lecture included, with student participation.
2. Showing explanatory films on the topic of safety and accident prevention.
3. Visits to work sites and learning about the safety procedures implemented there.

Evaluation methods:

1. Students are assessed individually by giving them the opportunity to participate in class by answering questions posed during the lecture.
2. Surprise rapid tests.
3. Monthly and final exams.
4. Extracurricular duties involve identifying hazard points and methods of protection from injuries for specific work sites.

C- Affective and value-based objectives:

C1- Motivating the development of thinking and how to deduce the appropriate course of action to prevent accidents.

C2- Encouraging safety and accident prevention, comparing it mentally with reality, and the extent to which it matches practical reality.

C3- Offering a helping hand to others in the event of an emergency and providing first aid to the injured person, whether at home, on the street, or at the workplace.

Teaching and learning methods :

- 1- First aid procedures illustrated.
- 2- Showing explanatory films.
- 3- spirit of cooperation to help others.
- 4- Field visits to work sites and observation of the safety procedures implemented there.

Evaluation methods :

1. Evaluation of the activities performed by students in the field of safety.
2. Evaluation of reports prepared by students for visiting work sites.
3. exams.

D - General and transferable skills (other skills related to employability and personal development):

D1- Enabling students to understand occupational safety in its practical and theoretical aspects.

D2- Developing the student's ability in the alarm methods used in workplaces .

D3- Enabling the student to reduce bad and unsafe behaviors.

D4- Enabling the student to give guidance on occupational health and safety.

10-Course structure:					
Evalu ation Metho d	Teachin g method	Unit/Topic Name	Required learning outcomes	Hours	Week
Discus 'sion written exams	Lectures	Causes of electric shock	Understandi ng the lesson topic	2	the first
Discus 'sion written exams	Lectures	Types of electrical injuries	Understandi ng the lesson topic	2	the secon d
Discus 'sion written exams	Lectures	Rescuing someone who has suffered an electric shock – freeing the victim	Understandi ng the lesson topic	2	the third
Discus 'sion written exams	Lectures	Artificial respiration - burn treatment	Understandi ng the lesson topic	2	Fourth
Discus 'sion written exams	Lectures	monthly exam	Understandi ng the lesson topic	2	Fifth
Discus 'sion written exams	Lectures	Effects caused by the passage of electric current to the ground	Understandi ng the lesson topic	2	Sixth
Discus 'sion written exams	Lectures	Fire alarm systems – control unit	Understandi ng the lesson topic	2	Seven th
Discus 'sion written exams	Lectures	- Fire detectors - Heat detectors Smoke detectors	Understandi ng the lesson topic	2	Eighth
Discus 'sion written exams	Lectures	Buildings that must be equipped with a fire alarm system	Understandi ng the lesson topic	2	Ninth
Discus 'sion written exams	Lectures	monthly exam	Understandi ng the lesson topic	2	tenth
Discus 'sion written exams	Lectures	Audible alarms, bells, and horns	Understandi ng the lesson topic	2	eleve nth

Discussion written exams	Lectures	Guidelines on occupational health and safety	Understanding the lesson topic	2	twelfth
Discussion written exams	Lectures	Reducing unsafe behaviors and practices	Understanding the lesson topic	2	thirteenth
Discussion written exams	Lectures	Personal protective equipment – eye protection – hearing protection	Understanding the lesson topic	2	fourteenth
Discussion written exams	Lectures	Personal protective clothing	Understanding the lesson topic	2	fifteenth

11- Infrastructure:

Occupational Safety Book	1-Required textbooks
Books on the subject of safety and accident prevention in workplaces are available in the institute's library	2-Main references (sources)
1-Books that deal with the topic of safety. 2-The General Civil Defense Magazine.	a) Recommended books and references (scientific journals, reports, etc).
1-Location of the Technical Institute/ Al-Rumaytha. 2- The website of the General Directorate of Civil Defense. 3-Websites of international companies .	b) Electronic references, websites...

12-Curriculum Development Plan:

1- Developing and updating the subject matter through the sectoral committees for electrical specializations in technical institutes in line with the developments taking place in workplaces and in electrical industries. 2-Participating in courses on occupational safety held by the Civil Defense.
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10-Digital electronics :

This course provides a study of digital signal-operated electronic components in terms of their operating principles, types , applications, and uses. Because of the importance of these components in modern computer systems, control devices, and communication devices.

– Middle Euphrates Technical University Technical Institute/Al-Rumaytha	1-Educational institution
Electrical Engineering Department	2- Scientific Department/ Center
/Digital ElectronicsRELEC1210	3-Course Name/Code
Daily attendance is mandatory	4- Available forms of attendance
Second semester/First year	5-Term / Year
hours (total) 60	6- Number of study hours (total)
2025/10/15	7- Date this description was prepared
8- Course Objectives:	
1–Introducing the student to electronic components that operate using digital signals.	
2–Introducing the student to the applications of digital electronic components .	
3–Number systems , digital mathematics.	
4– Defining for the student how to convert a signal from digital to linear, or from a linear to digital.	

9-: Course outcomes , teaching and learning methods, and assessment

A- Cognitive objectives:

A1– Introducing the student to the different number systems : decimal, binary, octal, and hexadecimal.

A2– Introducing the student to how to convert numbers from the binary system to the decimal system and vice versa.

A3– Introducing the student to mathematical operations: addition, subtraction, multiplication, and division in the binary system.

A4– Introducing the student to Logic Gates .

A5–Introducing the student to electronic circuits for mathematical operations.

A6– Flip Introducing the student to Flops ,their working principle, types, and uses .

A7– Introducing the student to counters and how they work.

A8– Introducing the student to how to convert a signal from digital to linear and vice versa.

B - The specific skills objectives of the course:

B1– The student acquires the skill of performing arithmetic operations for different numbering systems.

B2– The student acquires the skill of converting numbers from the decimal system to the binary system and vice versa.

B3– The student acquires the skill of dealing with logic gates.

B4– The student acquires the skill of using Flip Flops in electronic circuits.

B5– The student acquires the skill of designing meter circuits.

B6– The student acquires knowledge of how digital to linear signal converters work and vice versa.

Teaching and learning methods :

Theoretical lectures and practical applications

Evaluation methods:

- 1– Students are assessed individually by giving them the opportunity to participate in class by answering questions.
- 2–Students are assessed collectively through daily exams with practical and theoretical questions.
- 3–Monthly exams and final exams .

C- Affective and value-based objectives:

C1–Encouraging the development of students’ professional and technical thinking .

C2– Working to develop a distinctive student personality by enhancing cultural and social awareness, which will enable him, after graduation, to contribute effectively to serving his community.

C3–Expanding the cognitive horizon and using brainstorming to generate ideas .

C4–Practical skills that enable the student to use digital electronic components in future life .

Teaching and learning methods :

1. Using modern methods in presenting the theoretical and practical aspects, such as various electronic display devices, to attract attention and engage students so that .the idea reaches the student better
2. Giving students extracurricular assignments that require self–skills and .interpretations to be tested
3. Questioning students through discussion sessions by posing intellectual questions .(how, why, when, where, etc.) i) For specific topics
4. Using brainstorming and feedback techniques to activate students’ accumulated experiences by linking what was learned in previous academic stages to new .material

Evaluation methods :

1. Evaluation based on the weekly lecture level.
2. Weekly assessment of the practical aspect in the laboratory.
3. exams Monthly theoretical and practical.
4. Final exam, both theoretical and practical.

D - General and transferable skills (other skills related to employability and personal development):

D1 – Enabling students to utilize the knowledge and skills acquired in future workplaces.

D2 – Enabling students to pass job interviews.

D3 – Enabling students to carry out scientific development research that is directly related to our daily lives.

D4 – Enabling students to pass professional tests organized by employers.

D5 – Enabling students to engage in continuous self–development after graduation.

10- Course structure:

Eval uatio n Meth od	Teachi ng metho d	Unit/Topic Name	Require d learning outcome s	Hours	Week
Live assess ment + exams	Lectures + Practical Applicat ions	1 Number Systems 1.1 Analogue Versus Digital 1.2 Introduction to Number Systems 1.3 Decimal Number System 1.4 Binary Number System 1.4.1 Advantages 1.5 Octal Number System 1.6 Hexadecimal Number System 1.7 Number Systems – Some Common Terms 1.7.1 Binary Number System 1.7.2 Decimal Number System 1.7.3 Octal Number System 1.7.4 Hexadecimal	Understan ding the subject of unity	4	the first
Live assess ment + exams	Lectures + Practical Applicat ions	2 Binary Codes Binary Coded Decimal 2.1.1 BCD-to-Binary Conversion 2.1.2 Binary-to-BCD Conversion 2.1.3 Higher-Density BCD Encoding 2.1.4 Packed and Unpacked BCD Numbers 2.2 Excess-3 Code 2.3 Gray Code 2.3.1 Binary-Gray Code Conversion 2.3.2 Gray Code-Binary Conversion 2.3.3 Gray Code	Understan ding the subject of unity	4	the second
Live assess ment + exams	Lectures + Practical Applicat ions	3 Digital Arithmetic 3.1 Basic Rules of Binary Addition and Subtraction 3.2 Addition of Larger-Bit Binary Numbers	Understan ding the subject of unity	4	the third

		3.2.1 Addition Using the 2's Complement Method 3.3 Subtraction of Larger-Bit Binary Numbers 3.3.1 Subtraction Using 2's Complement Arithmetic 3.4 BCD Addition and Subtraction in Excess-3 Code 3.4.1 Addition 3.4.2 Subtraction 3.5 Binary Multiplication 3.5.1 Repeated Left-Shift and Add Algorithm 3.5.2 Repeated Add and Right-Shift Algorithm 3.6 Binary Division 3.6.1 Repeated Right-Shift and Subtract Algorithm			
Live assessment + exams	Lectures + Practical Applications	4 Logic Gates and Related Devices 4.1 Positive and Negative Logic 4.2 Truth Table 4.3 Logic Gates 4.3.1 OR Gate 4.3.2 AND Gate 4.3.3 NOT Gate 4.3.4 EXCLUSIVE-OR Gate 4.3.5 NAND Gate 4.3.6 NOR Gate 4.3.7 EXCLUSIVE-NOR Gate 4.3.8 INHIBIT Gate 4.4 Universal Gates	Understanding the subject of unity	4	Fourth

Live assessment + exams	Lectures + Practical Applications	5–Logic Families Logic Families – Significance and Types 5.1.1 Significance 5.1.2 Types of Logic Family 5.2 Characteristic Parameters 1 5.3 Transistor Logic (TTL)	Understand the subject of unity	4	Fifth
Live assessment + exams	Lectures + Practical Applications	6–Boolean Algebra and Simplification Techniques 6.1 Introduction to Boolean Algebra 189 6.1.1 Variables, Literals and Terms in Boolean Expressions 6.1.2 Equivalent and Complement of Boolean Expressions 6.1.3 Dual of a Boolean Expression 6.2 Postulates of Boolean Algebra 6.3 Theorems of Boolean Algebra	Understand the subject of unity	4	Sixth
Live assessment + exams	Lectures + Practical Applications	7–Arithmetic Circuits 7.1 Combinational Circuits 7.2 Implementing Combinational Logic 7.3 Arithmetic Circuits – Basic Building Blocks 7.3.1 Half–Adder 7.3.2 Full Adder 7.3.3 Half–Subtractor 7.3.4 Full Subtractor 7.3.5 Controlled Inverter 7.4 Adder–Subtractor 2	Understand the subject of unity	4	Seventh
Live assessment + exams	Lectures + Practical Applications	8–Multiplexers and Demultiplexers 8.1 Multiplexer 8.1.1 Inside the Multiplexer 8.1.2 Implementing Boolean Functions with Multiplexers 8.1.3 Multiplexers for Parallel–to–Serial Data Conversion 8.1.4 Cascading Multiplexer Circuits 280	Understand the subject of unity	4	Eighth

		8.2 Encoders 8.2.1 Priority Encoder 8.3 Demultiplexers and decoders 8.3.1 Implementing Boolean Functions with Decoders 8.3.2 Cascading Decoder Circuits			
Live assessment + exams	Lectures + Practical Applications	9–Programmable Logic Devices Fixed Logic Versus Programmable Logic 9.1.1 Advantages and Disadvantages 9.2 Programmable Logic Devices – An Overview	Understanding the subject of unity	4	Ninth
Live assessment + exams	Lectures + Practical Applications	10–Flip–Flops and Related Devices 10.1 Multivibrator 10.1.1 Bistable Multivibrator 10.1.2 Schmitt Trigger 10.1.3 Monostable Multivibrator 10.1.4 Astable Multivibrator 10.2 Integrated Circuit (IC) Multivibrators 10.2.1 Digital IC–Based Monostable Multivibrator 10.2.2 IC Timer–Based Multivibrators 10.3 RS Flip–Flop 10.3.1 RS Flip–Flop with Active LOW Inputs 10.3.2 RS Flip–Flop with Active HIGH Inputs 10.3.3 Clocked RS Flip–Flop	Understanding the subject of unity	4	tenth
Live assessment + exams	Lectures + Practical Applications	10.7.1 JK Flip–Flop as D Flip–Flop 10.7.2 D Latch 10.8 Synchronous and Asynchronous Inputs 10.9 Flip–Flop Timing Parameters	Understanding the subject of unity	4	eleventh
Live assessment + exams	Lectures + Practical Applications	12–Counters and Registers 11.1 Ripple (Asynchronous) Counter 11.1.1 Propagation Delay in Ripple Counters	Understanding the subject of unity	4	twelfth

		11.2 Synchronous Counter 11.3 Modulus of a Counter 11.4 Binary Ripple Counter – Operational Basics 11.4.1 Binary Ripple Counters with a Modulus of Less than 2N 11.4.2 Ripple Counters in IC Form			
Live assessment + exams	Lectures + Practical Applications	13–Counters and Registers Synchronous (or Parallel) Counters 11.6 UP/DOWN Counters 11.7 Decade and BCD Counters 11.8 Presettable Counters	Understanding the subject of unity	4	thirteenth
Live assessment + exams	Lectures + Practical Applications	14–Data Conversion Circuits – D/A and A/D Converters 12.1 Digital-to–Analogue Converters 12.1.1 Simple Resistive Divider Network for D/A Conversion 12.1.2 Binary Ladder Network for D/A Conversion 12.2 D/A Converter Specifications 12.2.1 Resolution 12.2.2 Accuracy 12.2.3 Conversion Speed or Settling Time 12.2.4 Dynamic Range	Understanding the subject of unity	4	fourteenth
Live assessment + exams	Lectures + Practical Applications	15–Data Conversion Circuits – D/A and A/D Converters Types of D/A Converter 12.3.1 Multiplying D/A Converters 12.3.2 Bipolar–Output D/A Converters 12.3.3 Companding D/A Converters Types of A/D Converter	Understanding the subject of unity	4	fifteenth

: Infrastructure -11

Academic lectures	1-Required textbooks
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References related to the subject and available at the institute's library	2-Main references (sources)
Scientific books and journals Related to the topic of Digital Electronics .basics, instructions, applications :	a) Recommended books and references (scientific journals, reports, etc).
Institute website, various internet resources, websites of international companies	b) Electronic references, websites...

12-Curriculum Development Plan:

1. Participating in various courses related to digital electronics .
2. To learn about the latest advancements in modern technology in digital electronics applications.
3. Holding development courses for laboratory staff that enhance their ability to train students more efficiently.
4. Opening to study components a laboratory specializing in digital electronics , principles,applications, and uses .

11-Arabic language

The overall objective of this course is to familiarize the student with the English terminology in the field of the vocabulary of the accounting department's curriculum, in a way that enables him to understand the terms presented and deal with in the various fields related to the specialization in administrative and accounting aspects.

Middle Euphrates University / Technical Institute - Al-Rumaytha	1. Educational institution
Electrical Engineering Department	2. / Scientific Department Center
/ Arabic language RELEC1211	3. Course Name/Code
My attendance is mandatory	4. Available forms of attendance
first	5. Semester/Year
1	6. Total number of study hours
10/15/2025	7. Date this description was prepared

8. Course Objectives

The Arabic language aims to teach the rules of the Arabic language, grammatical markers, how to analyze grammar, correct pronunciation, and how to choose appropriate words according to their positions in grammatical sentences.

Learning outcomes, teaching and learning methods, and assessment

A- Knowledge and understanding

- 1-Getting acquainted with the rules of the Arabic language.
- 2-Identifying the original and secondary grammatical markers.
- 3-Getting acquainted with Quranic grammar and its miraculous nature .

B)Subject-specific skills

- So she This enables the student in the accounting department to master the rules of the Arabic language in various topics and to avoid making linguistic and spelling mistakes when expressing any of the ideas related to the courses he studies.

Teaching and learning methods

Theoretical and practical lectures

Display method

Assessment methods

- Oral and written tests

C- Thinking skills

- Discussion of intellectual topics
- Visual aids

Teaching and learning methods

- Intellectual questions

Assessment methods

- Oral and written tests

D - General and transferable skills (other skills related to employability and personal development).

- The student was made proficient in the rules and signs of the Arabic language, learning the correct pronunciation of the Arabic letters and choosing the appropriate words according to their positions in the grammatical sentences.

12-English language

A scientific method for data entry

– Middle Euphrates University / Technical Institute Al-Rumaytha	• Educational institution
Electrical Engineering Department	• University Department/ Center
English language/ RELEC1212	• Course Name/Code
	• Programs that he enters
My attendance is mandatory	• Available forms of attendance
First	• Semester/Year
1	• Number of hours
10/15/2025	• Date this description was prepared
• Course Objectives	
To learn the basics of the English language, as well as to speak and become familiar with the terminology that enables the student to understand and know the language.	
• Learning outcomes, teaching and learning methods, and assessment	
A- Knowledge and understanding The student will be able to speak English in everyday life. - Learning English terminology	
b) Subject-specific skills Translation -Writing letters	
Teaching and learning methods	
- Lectures - Movie Show	
Assessment methods	
- Oral and written tests	
C- Thinking skills Brainstorming -thinking	
Teaching and learning methods	
Assessment methods	
	:Required readings ▪ Basic texts

	▪ The course textbook ▪ Other
	Special requirements (including, for example, workshops journals, software, and websites
	Social services (including, for example, guest lectures, vocational (training and field studies

• Course structure

Course Name: English Language

.1 Course Code: Accel

2. Semester/Year: First year

.3 Course Objectives

Course Objectives

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-
-

4. Teaching and learning strategies

Strategy

.5 Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 & 2	2	Cognitive	Hello	Lecture and discussion	Question and answers
3&4	2	Cognitive	Your world	Lecture and discussion	Question and answers
5&6	2	Emotional and cognitive	Personal information	Lecture and discussion	Question and answers
7&8	2	Emotional and cognitive	Family and friends	Lecture and discussion	Question and answers
9&10	2	Emotional and cognitive	It's my life	Lecture and discussion	Question and answers
11&12	2	Emotional and cognitive	Every day	Lecture and discussion	Question and answers
13&14	2	cognitive	Review	Lecture and discussion	Question and answers

15&16	2	Emotional and cognitive	Places I like	Lecture and discussion	Question and answers
17&18	2	Emotional	where I live	Lecture and discussion	Question and answers
19&20	2	Emotional and cognitive	Happy birthday	Lecture and discussion	Question and answers
21&22	2	cognitive	We had a good time	Lecture and discussion	Question and answers
23&24	2	cognitive	We can do it	Lecture and discussion	Question and answers
25&26	2	Emotional and cognitive	Thank you very much	Lecture and discussion	Question and answers
27&28	2	cognitive	Here and now	Lecture and discussion	Question and answers
29&30	2	Emotional and cognitive	It's time to go	Lecture and discussion	Question and answers

Second grade curriculum

11-Electrical machines :

This course provides a study of electrical machines, covering their operating principles, types, and calculations. Students will also be able to conduct practical tests on alternating current and direct current machines and measure their efficiency, enabling them to select the appropriate machine for the .required tasks

- Middle Euphrates Technical University Technical Institute/Al-Rumaytha	1-Educational institution
to divide Electrical Technologies / Grade 2	2- / Scientific Department Center
Electrical machines/ RELEC2001	3-Course Name/Code
Daily attendance is mandatory	Available forms of -4 attendance
(First semester + Second semester) / Second year	Term / Year -5
hours (total) 150	Number of study hours -6 (total)
2025/10/15	Date this description was -7 prepared
: Course Objectives -8	
The student will be able to: 1- Understandthe operating theory of direct current and alternating current machines . 2-He knows the types of electrical machines . 3- Operateelectrical machinery . 4- Identifythe parts of electrical machines . 5-Understands the theory of operation of electrical transformers and their types .	

9- Course outcomes, teaching and learning methods, and assessment:

A- Cognitive objectives:

- A1 – Introducing the student to the parts and operation of electrical machines.
- A2– Introducing the student to the theory of operation of direct current and alternating current machines.
- A3– Introducing the student to the operation of electrical machines.
- A4– Introducing the student to the parts of electrical machines and transformers.
- A5– Introducing the student to the basic equipment and devices found in the laboratory.
- A6– Training the student to conduct practical tests for alternating current and direct current machines.

A7– Training the student to measure the efficiency of the electrical machine so that he can choose the appropriate type of machine for the required tasks.

B - The specific skills objectives of the course:

B1 – Conducting practical experiments that verify the theoretical aspect.

B2 – Acquiring the skill of operating electrical machinery.

B3 – Acquiring the skill of analyzing the theory of operation of DC and AC machines.

B4– Acquiring a skill Conducting practical tests on alternating current and direct current machines.

B5– Acquiring the skill of measuring the efficiency of the electrical machine so that he can choose the type of machine required for the work.

Teaching and learning methods :

1–Theoretical lectures

2–Laboratory experiments

3–Using and touching measuring devices

4–Showing scientific films

Evaluation methods :

1. Students are assessed individually by giving them the opportunity to participate in class by answering questions.
2. Students are assessed collectively through daily exams with practical and theoretical questions.
3. Students are assessed collectively by being given extracurricular assignments such as writing personal reports or those related to practical experiments in laboratories.
4. Exams for the first and second semesters and final exams for the first and second rounds.

C- Affective and value-based objectives:

C1–Encouraging the development of students’ professional and technical thinking .

C2–Practical skills within laboratories and workshops .

C3–Expanding the cognitive horizon and using brainstorming to generate ideas .

C4-Developing internet research skills .

Teaching and learning methods:

1. Using modern methods in presenting the theoretical and practical aspects, such as various electronic display devices, to attract attention and engage students so that the idea reaches the student better.
2. Giving students extracurricular assignments that require self-skills and interpretations to be tested.
3. Questioning students through discussion groups by posing intellectual questions (how, why, when, where, which) on specific topics.
4. Using brainstorming and feedback techniques to activate students, accumulated experiences by linking what was learned in previous academic stages to new material.
5. To equip students with practical skills through conducting practical experiments on laboratory equipment.

: Evaluation methods

1. Evaluation based on the weekly lecture level.
2. Weekly assessment of the practical aspect in the laboratory.
3. Theoretical and practical semester exams.
4. Final exam, both theoretical and practical.

D - General and transferable skills (other skills related to employability and personal development):

- D1– Practical skills within workshops, laboratories and laboratories.
- D2 – Skills in conducting practical experiments that fulfill the theoretical aspect.
- D3– Skills in operating electrical machinery.
- D4 – Skills in analyzing the theory of operation of direct current and alternating current machines.

D5 – Skills Conducting practical tests on alternating current and direct current machines.

D6– Skills in measuring the efficiency of the electrical machine so that he can choose the type of machine required that is suitable for the required work.

Course structure -10:

Evalu ation Metho d	Teaching method	Unit/Topic Name	Required learning outcomes	Hours	Week
Live assess ment + exams	Lectures + Practical Applicati on	Magnetic circuits – Calculating the magnetic motive force – Similarities between magnetic and electrical circuits	Understan ding the subject of unity	5	the first
Live assess ment + exams	Lectures + Practical Applicati on	Basic principles of DC machines – Main parts of the machines – (Magnetic poles – Product – External .(structure	Understan ding the subject of unity	5	the second
Live assess ment + exams	Lectures + Practical Applicati on	Types of DC machines: Separate power supply – Self-powered (parallel – series – combined) – DC machine efficiency – losses – (types of losses fixed losses and variable losses) Power distribution stages in DC machines – providing mathematical examples of how to calculate efficiency and losses	Understan ding the subject of unity	5	the third
Live assess ment + exams	Lectures + Practical Applicati on	Electromotive force – Factors affecting electromotive force – Giving mathematical examples of how to calculate the electromotive force for all types of .generators	Understan ding the subject of unity	5	Fourth
Live assess ment + exams	Lectures + Practical Applicati on	Studying the magnetization curve (no-load curve) and how to find the critical resistance and critical speed on the magnetization curve. Examples of how to calculate the electromotive force, critical resistance and critical .speed of DC machines	Understan ding the subject of unity	5	Fifth
Live assess ment + exams	Lectures + Practical Applicati on	Studying the load characteristics of all types of DC machines, drawing their corresponding curves, and studying voltage regulation for different types of .generators	Understan ding the subject of unity	5	Sixth
Live assess ment + exams	Lectures + Practical Applicati on	DC motors Theory of Motor Operation – Reverse Electromotive Force – Equation of reverse electromotive force Comparison between DC motors and generators	Understan ding the subject of unity	5	Sevent h
Live assess ment + exams	Lectures + Practical Applicati on	– Determination – Determination on the product) Determination on the drive shaftshaft (Power distribution in DC motors Maximum electromagnetic power state in DC motors	Understan ding the subject of unity	5	Eighth
Live assess	Lectures +	General characteristics of speed and torque for motors (parallel – series combined)	Understan ding the	5	Ninth

ment + exams	Practical Applicati on	Speed regulation rate – calculation examples Comparison of DC motors in various industrial applications	subject of unity		
Live assess ment + exams	Lectures + Practical Applicati on	DC motor speed control Control by domain – Control by product Controlled by product voltage (Ward Leonard)	Understan ding the subject of unity	5	tenth
Live assess ment + exams	Lectures + Practical Applicati on	Motor testing (stop test – Swinburne test – Hopkinson – test – decrease test – calculation examples (calculation examples	Understan ding the subject of unity	5	elevent h
Live assess ment + exams	Lectures + Practical Applicati on	transformers Electrical/ Components and parts transformer theory Operation converter With the heart Internal– Converter With the heart External– Power Equation The pusher Electrical– drawing Vectors– Circle Equivalent to the transformer	Understan ding the subject of unity	5	twelfth
Live assess ment + exams	Lectures + Practical Applicati on	a test The circle Open And the cabin– how account Value of components The circle Equivalent– Transformer from condition Pregnancy– Plan Al–Touri For the transformer in condition Pregnancy– Losses– Calculation Efficiency condition maximum Efficiency– Issues Various	Understan ding the subject of unity	5	thirteen th
Live assess ment + exams	Lectures + Practical Applicati on	converter Self– issues adapter Current–adapter Effort– Uses The process	Understan ding the subject of unity	5	fourtee nth
Live assess ment + exams	Lectures + Practical Applicati on	Three–phase transformers <i>Different methods for connecting three–phase .transformers are problematic</i>	Understan ding the subject of unity	5	fifteenth
Live assess ment + exams	Lectures + Practical Applicati on	Engines induction trilogy Phases Advantages– Disadvantages– Scope magnetic Dizziness– theory Operation Slip– Frequency Part roundabout	Understan ding the subject of unity	5	Sixteen th
Live assess ment + exams	Lectures + Practical Applicati on	Types Engines engines The cage Squirrel – Engines The episodes slip Comparison Between them– composition all Type– Uses all type	Understan ding the subject of unity	5	sevente enth
Live assess ment + exams	Lectures + Practical Applicati on	Methods for controlling the starting of induction :motors include direct start, star–delta switch start, autotransformer start, and start by connecting resistors in series with .the rotor	Understan ding the subject of unity	5	eightee nth

Live assessment + exams	Lectures + Practical Application	relationship between determination and coefficient Ability– Relationship between determination and slip determination Start Rotation– condition maximum determination Start– Determination Rotation– condition maximum determination Rotation– Circle The reward For the engine The inciting– examples Calculation	Understand the subject of unity	5	nineteenth
Live assessment + exams	Lectures + Practical Application	reverse direction rotation Engines induction trilogy Phases– Methods Stop Engines Inductive– Control on Engines Induction using an effort Source– Number Poles– Frequency Source – position Resistance in circle Part roundabout Operating two engines on Succession	Understand the subject of unity	5	Twenty
Live assessment + exams	Lectures + Practical Application	induction motors Monotheism Phase– its types– its structure – theory Operation– How–to Get on determination primary Detailed explanation on Types Engines Single–phase induction –1 Engine The inciter With Al–Tur Split–2 motor The inciter With wide Start 3. Engine The inciter With wide Start The rotation of the engine–4 The inciter With pole shaded – 5 engine incompatibility 6. Engine The year was the opposite direction rotation per type	Understand the subject of unity	5	Twenty first–
Live assessment + exams	Lectures + Practical Application	Generators Synchronization: Its Structure– Principles Work– Types Generators with regards to Rotating organ coefficient Step– Coefficient distribution equation power The pusher Electric in condition Pregnancy -- Resistant) Inciting)– Saudi) And he drew plans The bull per carry an average to organize Effort – Issues Various	Understand the subject of unity	5	Twenty – second
Live assessment + exams	Lectures + Practical Application	comparison between Generators Current Continuous and generators Current Alternating Reasons make Product in Generators Synchronization Steady employment Generators on parallelism Reasons and conditions employment Generators Synchronization In parallel to explain practical Synchronization– rate to organize Effort Various issues	Understand the subject of unity	5	Twenty third–

Live assessment + exams	Lectures + Practical Application	Engines Synchronization– Composition and principles the job in Synchronous motors Start Operation in Engines Synchronization– Engine synchronous in Pregnancy Plan Al–Touri in condition factor capacity Unit– Power Factor Advanced worker capacity late account value power electric drive reverse	Understanding the subject of unity	5	Twenty fourth–
Live assessment + exams	Lectures + Practical Application	Uses Process– Rate to organize speed engine Shraja– Composition– Theory Work– Organization speed review General around engines Current Alternating	Understanding the subject of unity	5	Twenty fifth–
Live assessment + exams	Lectures + Practical Application	The general engine – its structure, properties, and uses The repulsive engine – its structure, operating theory properties, and applications	Understanding the subject of unity	5	Twenty sixth–
Live assessment + exams	Lectures + Practical Application	Control motors – their types – their structure – their operating theory – the conditions that must be met by control motors – their characteristics	Understanding the subject of unity	5	Twenty – seventh
Live assessment + exams	Lectures + Practical Application	Stepper motors – their construction – applications in which they are used – distinguishing between their types Theory of operation of stepper motors – Calculating the step of the motor – Writing logical tables for the rotation of the stepper motor in the desired direction	Understanding the subject of unity	5	Twenty eighth–
Live assessment + exams	Lectures + Practical Application	Tachometer generators – Types of tachometers and how to distinguish between them – Causes of – tachometer reading errors and how to avoid them How to calibrate tachometers	Understanding the subject of unity	5	Twenty ninth–
Live assessment + exams	Lectures + Practical Application	Linear motors – Types of linear motors – Induction linear motors – Problems that arise with linear motors	Understanding the subject of unity	5	thirty

: Infrastructure -11

Electrical Machines, by Dr. Muhammad Zaki Muhammad Khader / University of Mosul	Required textbooks .1
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1- Electrical Machines, authored by Sultan Hussein and Muhammad Al-Sayed Ragheb 2- Text book of electrical technology by BL Theraga	2.Main references (sources)
Electrical machine direct and alternating current by siskind .	a) Recommended books and references (scientific journals, reports, etc).
1-Location of the Technical Institute/ Al-Rumaytha 2-Variou Internet sources	...b) Electronic references, websites

12-Curriculum Development Plan:

1. Continuous monitoring of updating the vocabulary of the Electrical Machines subject by the sectoral committees.
2. The teaching staff participated in development courses in the subject of machinery.
3. To learn about the latest advancements in modern technology in this field.
4. Preparing courses that develop the capabilities of trainers in the laboratory so that they can train students more efficiently.
5. Equipping laboratories with modern equipment that keeps pace with scientific developments in developed countries.

3- Electrical networks:

This course provides a comprehensive study of the electrical system, including power generation stations , transmission lines, and distribution networks. It also covers methods for protecting electrical equipment and devices.

Middle Al-Furat Technical Institute/ Tarmitha Technical University	1-Educational institution
Electrical Engineering Department	2- Scientific Department / Center

/ Electrical Networks RELEC2002	3-Course Name/Code
Daily attendance is mandatory	4- Available forms of attendance
First and second semesters / Second year	5-Term / Year
hours per year 120	6- Number of study hours (total)
2025/10/15	7- Date this description was prepared
8- Course Objectives: The student will be able to know:	
1-Stages of the electrical system .	
2-How to generate, transmit and distribute electrical energy .	
3-How to control and protect the components of the electrical system.	
4-The economic aspect of the electrical system.	

9- Course outcomes, teaching and learning methods, and assessment:

A- Cognitive objectives: The student can learn:

A1-and theories and the basics of the components of the electrical system.

A2- Types of power generation stations, their components, their operating principle, and calculations related to generating electrical power.

A3- How to transmit and distribute electrical power.

A4- Types of transmission lines, their components, and calculations related to transmission lines.

A5- Control and protection methods for the components of the electrical system.

A6- Economic considerations for the electrical system, calculations related to that.

B - The specific skills objectives of the course:

B1- Conducting practical experiments that fulfill the theoretical aspect of studying the components of the electrical system.

B2- Acquiring the skill of identifying faults in underground cables .

B3 - Acquiring the skill of using measuring devices in the electrical system .

B4– Acquiring the skill of testing transformer and generator oil .

B5 – Acquiring skills in using protection devices for the electrical system .

B6– Acquiring skills in operating power generation stations according to the required loads.

Teaching and learning methods:

1– Theoretical lectures based on an educational package using appropriate technologies.

2– Laboratory experiments to study theories and calculations related to the .electrical system

3–Using and touching measuring devices for various electrical quantities.

4– Showing scientific filmsabout the electrical power system.

5–Field visits to power generation and conversion stations.

Evaluation methods:

1. Students are assessed individually byallowing them to participate in class by answering questions.
2. Students are assessed collectively through daily exams with practical and theoretical questions.
3. Students are assessed collectively by being given extracurricular assignments such as writing personal reports or those related to practical experiments in laboratories.
4. Exams for the first and second semesters and final exams for the first and second rounds.

C- Affective and value-based objectives:

C1–Encouraging the development of students’ professional and technical thinking .

C2– Working to develop a distinctive student personality by enhancing cultural and social awareness, which will enable him, after graduation, to contribute effectively to serving his community.

C3–Expanding the cognitive horizon and using brainstorming to generate ideas .

C4– Practical skills that enable the student to research the problem we face in terms of electrical energy and its maintenance and to find logical solutions to it.

Teaching and learning methods.

1. „Using modern methods in presenting the theoretical and practical aspects such as various electronic display devices, to attract attention and engage students so that the idea reaches the student better.
2. Giving students extracurricular assignments that require self–skills and interpretations to be tested.
3. Questioning students through discussion sessions by posing intellectual questions (how, why, when, where, etc.) i) For specific topics.
4. Using brainstorming and feedback techniques to activate students accumulated experiences by linking what was learned in previous academic stages to new material.
5. To equip students with practical skills through conducting practical experiments on laboratory equipment.

Evaluation methods :

1. Evaluation based on the weekly lecture level.
2. Weekly assessment of the practical aspect in the laboratory.
3. Theoretical and practical semester exams.
4. Final exam, both theoretical and practical.

D - General and transferable skills (other skills related to employability and personal development) :

D1: Enabling students to prepare scientific reports.

D2: Enabling students to pass job interviews.

D3: Enabling students to conduct scientific and developmental research that is directly related to our daily lives.

D4: Enabling students to pass professional tests organized by employers.

D5: Enabling students to engage in continuous self-development after graduation.

10- Course structure:

Evaluation Method	Teaching method	Unit/Topic Name	Required learning outcomes	Hours	Week
Live assessment + nt exams	Lectures Film + Screenings	How electrical energy is generated, energy evolution, the electrical power system from generation to consumption, standard voltages	Understanding the subject of unity	8	+ First Second
Live assessment + nt exams	Lectures Film + Screenings Scientific Visits	Hydroelectric and thermal power plants	Understanding the subject of unity	4	the third
Live assessment + nt exams	Lectures + Scientific Visits	Gas-fired power plants and an overview of some other plants such as diesel	Understanding the subject of unity	4	Fourth
Live assessment + nt exams	Lectures Film + Screenings Scientific Visits	) Vertical busbarBB system and diagrams for (indoor and outdoor transformer substations	Understanding the subject of unity	4	Fifth
Live assessment + nt exams	Lectures + Practical	Overhead lines, their uses, and the division of .lines into short, medium, and long lines	Understanding the subject of unity	4	Sixth
Live assessment + nt exams	Lectures + Practical	Overhead lines – mechanical calculations :including Calculating tension and relaxation when the distances from the ground surface are equal Calculate the weight of the snow – .accumulated on the wire Calculating the amount of wind pressure acting on the wire	Understanding the subject of unity	4	Seventh
Live assessment + nt exams	Lectures + Practical	Calculations for the basic elements of overhead :lines – electrical calculations, including Resistance calculation Calculating the internal and external inductance of a single wire Calculating the inductance of a three-wire system with three wires spaced apart	Understanding the subject of unity	4	Eighth

		They are separated from each other by equal distances, or by different distances or they alternate locations			
Live assessment + nt exams	Lectures + Practical	Calculating the capacity of a single-phase, three--- phase system consisting of three wires spaced apart They are separated from each other by equal or different distances and they alternate locations	Understan ding the subject of unity	4	Ninth
Live assessment + nt exams	Lectures + Practical	Solving various problems from weeks seven and eight	Understan ding the subject of unity	4	tenth
Live assessment + nt exams	Lectures + Practical	Solving short circuits involves representing them as an electrical circuit and calculating their efficiency Solve the middle lines and divide them into Representing it as a -T -shaped electrical circuit Representing it as an electrical circuit in - the shape of a letter π	Understan ding the subject of unity	4	elevent h
Live assessment + nt exams	Lectures + Practical	Overhead transmission line insulators: types shapes, installation, vacuum phenomenon causes, and methods used to eliminate it	Understan ding the subject of unity	4	twelfth
Live assessment + nt exams	Lectures + Practical	Underground cables – their components – their classification – cable range	Understan ding the subject of unity	4	thirteen th
Live assessment + nt exams	Lectures + Practical	Calculating the capacitance and inductance of single-pole and three-pole underground cables	Understan ding the subject of unity	4	fourtee nth
Live assessment + nt exams	Lectures + Practical	Voltage gradient in cables, calculation of loss and its angle in insulators, and cable breakdown	Understan ding the subject of unity	4	fifteenth
Live assessment + nt exams	Lectures + Practical	High voltage cables – their components – their types	Understan ding the subject of unity	4	Sixteen th
Live assessment + nt exams	Lectures + Practical	Distribution networks and DC distributors that feed from one end – that feed from two ends AC power distributors that feed from one end	Understan ding the subject of unity	4	sevente enth
Live assessment + nt exams	Lectures + Practical	All types of ring diffusers – a comparison between different types	Understan ding the subject of unity	4	eightee nth

Live assessment + nt exams	Lectures + Practical	Solve various examples about weeks sixteen and seventeen	Understanding the subject of unity	4	nineteenth
Live assessment + nt exams	Lectures + Practical	Conditions for stable operation of synchronous generators with the grid – load power curve; how synchronous generators operate in parallel with each other and with the grid	Understanding the subject of unity	4	Twenty
Live assessment + nt exams	Lectures + Practical	Methods for improving the power factor are :divided into Static capacitors – Synchronous motors – Phase–advance devices	Understanding the subject of unity	4	Twenty first–
Live assessment + nt exams	Lectures + Practical	Types of errors in electrical networks and their :classification Symmetrical faults and calculation of fault – current in an electrical circuit Asymmetrical faults and calculation of fault – current in an electrical circuit) Calculation of basic units –PU (	Understanding the subject of unity	4	Twenty – second
Live assessment + nt exams	Lectures + Practical	Principles of protection, their definition, various systems, and uses of protection and disconnection relays and circuit breakers in electrical power :systems and measuring devices, including Voltage measuring transformers – Current measuring transformers	Understanding the subject of unity	4	Twenty third–
Live assessment + nt exams	Lectures + Practical	Follow–ups, classified according to their operating principle: inductive follow–ups (against overcurrent), (against reverse power), electronic follow–ups	Understanding the subject of unity	4	Twenty fourth–
Live assessment + nt exams	Lectures + Practical	How to protect overhead transmission lines Distance protection (line impedance –) measurement protection) – Rail protectionBB (	Understanding the subject of unity	4	Twenty fifth–
Live assessment + nt exams	Lectures + Practical	How to protect power transformers using DifferentialProtection	Understanding the subject of unity	4	Twenty sixth–
Live assessment + nt exams	Lectures + Practical	:How to protect synchronous generators using DifferentialProtection DigitalProtection ReversePower Protection	Understanding the subject of unity	4	Twenty – seventh
Live assessment + nt exams	Lectures + Practical	Protecting the stator from overcurrent and .protecting the rotor	Understanding the subject of unity	4	Twenty – eighth

Live assessment + nt exams	Lectures + Practical	Percentage Reactance	Understand the subject of unity	4	Twenty ninth–
Live assessment + nt exams	Lectures + Practical	Power circuit diagram at the receiving end	Understand the subject of unity	4	thirty

11- Infrastructure :

1- Electrical Networks for second year students. Preparation Committee Sectoral)	1-Required textbooks
1- Electrical Power, authored by Dr. Abdul Sahib Hassan Majeed. 2- Electrical Networks, prepared by Hashem Abdul-Razzaq Zalzal and Armin Mekerdjian.	2-Main references (sources)
1- Electrical Measurements, authored by Dr. Muzaffar Anwar Al-Na'ma and Dr. Sinan Mahmoud. 2- A Text Book on Power System Engineering By A.Chakrabarti , ML Soni , PV Gupta and US Bhatnagar.	a) Recommended books and references (scientific journals, reports, etc.)
1-Technical Institute/ Rumaytha Location 2-Websites of global electricity companies	b) Electronic references, websites...

3- Power electronics:

Introducing the student to the electronic components used in electrical power systems, theory of operation, and uses.

Al-Furat Technical Institute/ Al-Rumaytha Middle Technical University	1- Educational institution
Electrical Engineering Department	2- Scientific Department/ Center
/Electrical Power Electronics RELEC2003	3- Course Name/Code
Daily attendance is mandatory	4- Available forms of attendance
First and second semesters / Second year	5- Term /Year
hours per year 150	6- Number of study hours (total)

12-Curriculum Development Plan:

1. Continuous monitoring of updating the vocabulary of the electrical networks material by the sectoral committees.
2. The teaching staff participated in development courses on topics related to the electrical power system.
3. To learn about the latest advancements in modern technology in this field.
4. Preparing courses that develop the capabilities of trainers in the laboratory so that they can train students more efficiently.
5. Equipping laboratories with modern equipment that keeps pace with scientific development in developed countries so that there is greater compatibility between theoretical lectures and practical applications in the laboratory.

2025/10/15

7- Date this description was prepared

8- Course Objectives:

The student will be able to know:

General objective: To introduce the student to the electronic components used in power electronics.

Specific objective: The student will be able to become familiar with: the electronic components manufactured from semiconductors and used in power electronics, and will be able to analyze the electronic circuits of power electronics systems.

1– To qualify the students of the department to be familiar with the theoretical and practical aspects in the fields of electronic circuits used in high–power control circuits, electrical power stations, and electrical power converters such as rectifiers, converters, switches, frequency converters, voltage regulators, and the study of electronic components that perform these applications in all fields of electronic control.

2– Working to develop a distinctive personality for the student by developing cultural and social awareness, which qualifies him after graduation to contribute effectively to serving his community.

3– Working to create a suitable scientific environment to prepare highly specialized, technically and professionally skilled personnel, while developing their capabilities in the field of research, problem–solving, and the ability to provide appropriate solutions and alternatives.

4–Researching modern topics and identifying problems that require more in– depth scientific research.

9- Course outcomes , teaching and learning methods, and assessment:

A-Cognitive objectives :

A1- To introduce the student to the theoretical and practical aspects of the fields of electronic circuits used in high–power control circuits, electrical power stations, and electrical switches, frequency converters, and voltage , power converters such as rectifiers, converters regulators, and to study the electronic components that perform these applications in all fields of electronic contro.

A2–Introducing the student to power electronics systems .

A3– Introducing the student to the analysis of electronic circuits and their applications .

A4– Introducing the student to the specifications and features of power electronics systems.

B - The specific skills objectives of the course.

B1– Practical skills that enable the student to use scientific theories and translate them into a tangible reality with fruitful results.

B2– Acquiring extensive knowledge and skills in the field of high–power electronic control.

B3 – Acquiring the skill of using electronic switches in building power electronics systems .

B4– Acquiring the skill of designing and analyzing power electronics systems .

B5– Acquiring the skill of designing and building applied circuits for some systems .

Teaching and learning methods:

1– Theoretical lectures based on a scientific portfolio designed to provide students with the basics and additional topics related to the learning outcomes of previous skills, to solve practical problems.

2– Applying the topics studied theoretically at the practical level in the various laboratories of the Electrical Engineering Department.

3– Organizing visits and scientific trips to various electrical power stations during the academic semester.

4–Showing scientific films related to the subject .

Evaluation methods:

1– Students are assessed individually by giving them the opportunity to participate in class by answering questions.

2– Students are assessed collectively through daily exams with theoretical and practical questions.

3– Students are assessed collectively by being given extracurricular assignments such as writing personal reports or those related to practical experiments in laboratories.

4– Exams for the first and second semesters and final exams for the first and second rounds.

C- Affective and value-based objectives:

A1– Encouraging the development of students’ professional and technical thinking.

A2– Working to develop a distinctive student personality by enhancing cultural and social awareness, which will enable him, after graduation, to contribute effectively to .serving his community

A3–Expanding the cognitive horizon and using brainstorming to generate ideas –.
Practical skills that enable the student to research the problem we face in –Q4
.terms of electrical energy and its maintenance and to find logical solutions to it

Teaching and learning methods:

- 1– Using modern methods in presenting the theoretical and practical aspects, such as various electronic display devices, to attract attention and engage students so that the idea reaches the student better.
- 2– Giving students extracurricular assignments that require self–skills and interpretations to be tested.
- 3– Questioning students through discussion sessions by posing intellectual questions (how, why, when, where, etc.) i) For specific topics.
- 4– Using brainstorming and feedback techniques to activate students accumulated experiences by linking what was learned in previous academic stages to new material.
- 5– To equip students with practical skills through conducting practical experiments on laboratory equipment.

Evaluation methods :

- 1 – Evaluation based on the weekly lecture level .
- 2– Weekly assessment of the practical aspect in the laboratory .
- 3– Theoretical and practical semester exams .
- 4– Final exam, both theoretical and practical .

D - General and transferable skills (other skills related to employability and personal development):

D1– Enabling students to prepare scientific reports.

D2– Enabling students to pass job interviews.

D3– Enabling students to conduct scientific development research that is directly related to our daily lives.

D4– Enabling students to pass professional tests organized by employers.

D5– Enabling students to engage in continuous self–development after graduation.

Course structure -10:

Evalu ation Meth od	Teachin g method	Unit/Topic Name	Require d learning outcome s	Hours	Week
Live assessm + ent exams	+ Lectures Film Screenings	Power electronic components which used in high power control (power diodes, thyristor and power transistors) pevison of single phase rectifier circuites by using diodes.	Understan ding the subject of unity	5	the first
Live assessm + ent exams	+ Lectures Film Screenings + Scientific Visits	Three phase rectifier circuites by using diodes, output voltage waveform, diode current waveform, output voltage equation in case of resistance load.	Understan ding the subject of unity	5	the second
Live assessm + ent exams	+ Lectures Scientific Visits	Using the transistor as switch, regions of operation, transistor as a switch (cut off and saturation)	Understan ding the subject of unity	5	the third
Live assessm + ent exams	+ Lectures Film Screenings + Scientific Visits	Power transistor in (off)and (on)state, improvement of(off)and(on)time by usenig speed up capacitance, practical problems.	Understan ding the subject of unity	5	Fourth
Live assessm + ent exams	+ Lectures Practical	Uniplolor junction transistor, construction, theoretical operation, using the transistor as relaxation oscillator practical example	Understan ding the subject of unity	5	Fifth
Live assessm + ent exams	+ Lectures Practical	operational amplifier , description of operational amplifier (op-amp) as asparate components, zero detector, comparator	Understan ding the subject of unity	5	Sixth
Live assessm + ent exams	+ Lectures Practical	The use of op-amp as astable Multivibrator and a monostable multivibrator , photo conduction cells, photo diodes	Understan ding the subject of unity	5	Sevent h
Live assessm + ent exams	+ Lectures Practical	Light – emitting diodes (LED), photo transistors, the use of optical comparator in power electronic circuits	Understan ding the subject of unity	5	Eighth
Live assessm + ent exams	+ Lectures Practical	Thyristor, construction, characteristic, curves for a thyristor, thyristor conduction in forward biasing, thyristor family, thyristor representation as a double transistor circuit.	Understan ding the subject of unity	5	Ninth
Live assessm + ent exams	+ Lectures Practical	Thyristor conduction methods , conduction throw the gate minimum gate current causing conduction , conduction time , conduction due to high forward voltage rectifire (dv/dt)	Understan ding the subject of unity	5	tenth

Live assessm + ent exams	+ Lectures Practical	DIAC, TRIAC characteristics, practical applications, thyristor, triggering methods, triggering on DC and AC current, pluse triggering types	Understan ding the subject of unity	5	elevant h
Live assessm + ent exams	+ Lectures Practical	thyristor triggering circuit, DC and AC triggering circuits	Understan ding the subject of unity	5	twelfth
Live assessm + ent exams	+ Lectures Practical	Pluse current triggering circuit, relaxation oscillator, zero detector, comparator with stable and monostable multivibrators (operational amplifiers and timer)	Understan ding the subject of unity	5	thirteen th
Live assessm + ent exams	+ Lectures Practical	Thyristor general application introductory, AC to DC inverter DC to AC inverter, DC to DC inverter, AC to AC inverter, phase controlled halfwave rectifire with resistance and indctormce load out put current and voltage waveform, output voltage equations	Understan ding the subject of unity	5	fourtee nth
Live assessm + ent exams	+ Lectures Practical	Half controller full wave rectifire fully controlled, resistance and inductance load, generated wave forms, out put voltage equation for free wheeling diode.	Understan ding the subject of unity	5	fifteenth
Live assessm + ent exams	+ Lectures Practical	Regenrating fully controlled inverters, examples, DC motor speed control	Understan ding the subject of unity	5	Sixteen th
Live assessm + ent exams	+ Lectures Practical	Three-face inverters, out put voltage wave form with ,triggering pulses and equations	Understan ding the subject of unity	5	sevente enth
Live assessm + ent exams	+ Lectures Practical	Thyristor protection from the high rate change in current and voltage, protection from the transient change in source voltage, fully protection circuit from all possible faults due to current and voltage.	Understan ding the subject of unity	5	eightee nth
Live assessm + ent exams	+ Lectures Practical	DC to AC inverters methods of forcing the thyristor to get off	Understan ding the subject of unity	5	ninetee nth
Live assessm + ent exams	+ Lectures Practical	Parallel and senies Inverter, single and three phase, control methods in charging frequency and voltage, out put wave forms1	Understan ding the subject of unity	5	Twenty
Live assessm + ent exams	+ Lectures Practical	Inverter application, emergency power supply, single phase DC motor speed control	Understan ding the subject of unity	5	Twenty first–
Live assessm + ent exams	+ Lectures Practical	Three phase motor control by using a constant ratio of variation frequency and voltage	Understan ding the subject of unity	5	Twenty – second
Live assessm + ent exams	+ Lectures Practical	Choppers, DC to DC inverter frequency constant, line constant	Understan ding the	5	Twenty third–

+ ent exams			subject of unity		
Live assessm + ent exams	+ Lectures Practical	Types of choppers, DC motor speed control	Understan ding the subject of unity	5	Twenty fourth–
Live assessm + ent exams	+ Lectures Practical	AC to AC inverter , single phase voltage regulator , three phase voltage regulator	Understan ding the subject of unity	5	Twenty fifth–
Live assessm + ent exams	+ Lectures Practical	General application on single and three induction motor speed control due to the change in stat or voltage , using the closed loop feedback circuit to control the slippery rings of AC motor	Understan ding the subject of unity	5	Twenty sixth–
Live assessm + ent exams	+ Lectures Practical	Cyclic inverter, AC to DC cyclic inverter, DC to DC cyclic inverter	Understan ding the subject of unity	5	Twenty – seventh
Live assessm + ent exams	+ Lectures Practical	AC to AC cyclic inverter control block diagram	Understan ding the subject of unity	5	Twenty eighth–
Live assessm + ent exams	+ Lectures Practical	Using amplitude modulation for speed control	Understan ding the subject of unity	5	Twenty ninth–
Live assessm + ent exams	+ Lectures Practical	Using polar transistor for AC motor speed control	Understan ding the subject of unity	5	thirty

: Infrastructure -11

1- Electrical Networks for second year students. Preparation Committee Sectoral)	1.Required textbooks
1– Power Electronics, authored by Diaa Dahy and Youssef Ibrahim 2– Power Electronics (authored by Dr. Muzaffar Anwar Al–Na'ma) 3– Advanced industrial electronics by Morris . 4– Thyristor engineering by B.B. Berde .	2.Main references (sources)

1– Electronics in the service of electrical applications. Translated by Dr. Samir Rustum. 2– Scientific journals that focus on the topic of power electronics.	a) Recommended books and references (scientific journals, reports, etc.)
1-Technical Institute/ Rumaytha Location 2- Websites of global electricity companies.	b) Electronic references, websites...

12-Curriculum Development Plan:

1. Continuous monitoring of updating the material's vocabulary by the sectoral committees.
2. The teaching staff participated in development courses on the topics of protection and control of the electrical power system.
3. To learn about the latest advancements in modern technology in this field.
4. Preparing courses that develop the capabilities of trainers in the laboratory so that they can train students more efficiently.
5. Equipping laboratories with modern equipment that keeps pace with scientific development in developed countries so that there is greater compatibility between theoretical lectures and practical applications in the laboratory.

4- Maintenance workshop:

Training the student in maintenance work for various electrical equipment and devices.

Al-Furat Technical Institute/ Al-Rumaytha Middle Technical University	1-Educational institution
Electrical Engineering Department	2- Scientific Department/ Center

Maintenance Workshop/ RELEC2004	3-Course Name/Code
Daily attendance is mandatory	4- Available forms of attendance
First and second semesters / Second year	5-Term / Year
hours per year 120	6- Number of study hours (total)
2025/10/15	7- Date this description was prepared

8- Course Objectives:

The student will also be able to:

1. It uses the various devices, tools, and components used in workshops.
2. He gains the skill and technical expertise in various electrical maintenance works.
3. He gains self-confidence to perform electrical technical work in troubleshooting faults and learning how to repair them.
4. It distinguishes and identifies the various electrical and electronic components and how to use them in building different circuits

9- Course outcomes , teaching and learning methods, and assessment:

A- Cognitive objectives:

- A1- Introducing the student to the maintenance work for electrical equipment.
- A2- Introducing the student to electrical technical work in troubleshooting electrical devices and learning how to repair them.
- A3- Introducing the student to the various electrical and electronic components and how to use them in building electrical circuits.
- A4- Introducing the student to how to disassemble and assemble the parts of electrical machines.
- A5- Introducing the student to how Inspecting electrical machinery after winding it.
- A6- Introducing the student to how It distinguishes between electrical machines and improves the selection process.

B - The specific skills objectives of the course:

- B1 - Acquiring the skill of installing DC motors, methods of rewinding DC motors.
- B2 - Acquiring the skill of designing and studying three-phase electrical transformers.

B3 – Acquiring the skill of rewinding the stator windings of a three-phase induction motor and squirrel cage.

B4– Acquiring the skill of assembling the motor and testing the motor under its designated load.

B5– Acquiring the skill of performing periodic maintenance on a split-phase motor, conducting the necessary tests on it, identifying faults and methods of treating them.

B6– Acquiring the skill of winding a shaded pole motor of its various types.

B7– Acquiring the skill of winding the capacitor-type motor and conducting the necessary tests on it.

B8– Acquiring the skill of maintaining household appliances (such as the household freezer (and the household air conditioner.

Teaching and learning methods:

1– To provide students with the basics and additional topics related to the learning outcomes of previous skills, in order to solve practical problems.

2– Applying the topics studied theoretically to the practical level in the electrical maintenance workshop.

3–Organizing visits and scientific trips to electrical maintenance workshops in production sites .

4– Manual work in the use of hand tools and measuring instruments, and the ability to work and operate machines in the best way.

5– about the maintenance of electrical appliances Showing scientific films.

Evaluation methods:

1– Ongoing evaluation of student work in the workshop.

2– Students are assessed individually by giving them the opportunity to participate in class by answering questions.

3– Students are assessed collectively through daily exams with practical and theoretical questions.

4– Students are assessed collectively by being given extracurricular assignments such as writing personal reports or those related to practical experiences in the workshop.

C- Affective and value-based objectives:

Q1– Practical skills that enable the student to research, identify, and fix faults in electrical devices.

Q2– Practical skills that enable the student to cooperate in work with others .

Q3– Maintaining the safety of the equipment and furniture in the workshop, as it is public property.

Q4– The student's ability to think systematically and therefore to make decisions.

Q5– Encouraging students to gather information that increases their knowledge.

Q6– Encouraging the student to acquire individual skills in the work environment .

Teaching and learning methods:

- 1– To equip students with practical skills through carrying out maintenance work in electrical workshops.
- 2– Conducting experiments that stimulate a spirit of cooperation among students.
- 3– Using the group method in education.
- 4– Sending students for training in electricity departments, hospitals, power generation stations, and maintenance units in production plants during summer training.

Evaluation methods :

1. Attendance at the lecture and discussion with student participation.
2. The tests are during the lecture.
3. Creating explanatory posters.
4. Students are assessed collectively through practical exams.
5. Student performance evaluation during summer training by the supervisor at the work site.

D - General and transferable skills (other skills related to employability and personal development) :

D1 : Enabling students to prepare scientific reports for their future professional lives.

D2: Empowering students to have self-confidence in problem-solving.

D3: Enabling students to integrate into the work environment and try to deal with people.

D4 : Enabling students to pass professional tests organized by employers.

D5 : Enabling students to engage in continuous self-development after graduation.

D6 : Enabling students to use work equipment correctly.

10- Course structure:

Eval uatio n Meth od	Teachi ng metho d	Unit/Topic Name	Required learning outcomes	Hours	Week
Ongoi ng assess ment	Performi ng exercise s	DC motor installation – DC motor rewinding methods – Detailed diagram	acquiring skills Technical expertise on the subject of unity	4	the first
Ongoi ng assess ment	Performi ng exercise s	– How to clean the surface of the units Installing carbon brushes – Application of carbon brushes	acquiring skills Technical expertise on the subject of unity	4	the second
Ongoi ng assess ment	Performi ng exercise s	Connection, breakage, and insulation testing	acquiring skills Technical expertise on the subject of unity	4	the third
Ongoi ng assess ment	Performi ng exercise s	– DC generator output coil windings Information preparation and compilation Winding the output coil and securing – – the coils to the iron core slots Simplified examples of winding	acquiring skills Technical expertise on the subject of unity	4	Fourth
Ongoi ng assess ment	Performi ng exercise s	Varnish insulation – drying – end connection – final selection of the production element – complete drawing of the production element with all its components, connections, and uses	acquiring skills Technical expertise on the subject of unity	4	Fifth

Ongoing assessment	Performing exercises	Field coils – Information gathering for parallel and series coils – Formation of large-section conductors – Properties of series and parallel field coils and methods of connecting them in the machine. Winding on the die	acquiring skills Technical expertise on the subject of unity	4	Sixth
Ongoing assessment	Performing exercises	Coil preparation and single-pole – mounting – full machine testing ,electrical transformer – preparation cutting, and assembly of iron core plates coil winding, varnishing, and training –) on creating a simplified templateform (before winding	acquiring skills Technical expertise on the subject of unity	8	Seventh + h Eighth
Ongoing assessment	Performing exercises	– Connecting and linking terminals – Polarity testing – Continuity testing Node testing and insulation testing in windings. Examples of designing and .rewinding a small-power transformer	acquiring skills Technical expertise on the subject of unity	4	Ninth
Ongoing assessment	Performing exercises	– Study of three-phase transformers simple design and detailed drawing	acquiring skills Technical expertise on the subject of unity	4	tenth
Ongoing assessment	Performing exercises	Preparing, cutting, and assembling the – iron core sheets – winding the coils fixing and varnishing – drying	acquiring skills Technical expertise on the subject of unity	4	eleventh
Ongoing assessment	Performing exercises	Polarity test – Continuity test – Earth – leakage test – Short circuit test Insulation test and measurement	acquiring skills Technical expertise on	4	twelfth

			the subject of unity		
Ongoing assessment	Performing exercises	Induction Motors: Stator winding rewinding for a three-phase squirrel-cage induction motor – Calculating and drawing the general shape of the windings, removing insulation and cleaning the slots – Insulating the stator slots – Winding and shaping the windings, then securing them to the slots	acquiring skills Technical expertise on the subject of unity	4	thirteenth
Ongoing assessment	Performing exercises	Winding and connecting the ends of the coils and testing for continuity	acquiring skills Technical expertise on the subject of unity	4	fourteenth
Ongoing assessment	Performing exercises	– Selecting the contract in the files – Selecting and measuring the insulation Selecting the ground leakage for the motor	acquiring skills Technical expertise on the subject of unity	4	fifteenth
Ongoing assessment	Performing exercises	Motor assembly and testing under its designated load – Study of the starting phase of three-phase motors – Direct method – Self-starting method	acquiring skills Technical expertise on the subject of unity	8	Sixteen + th seventeenth
Ongoing assessment	Performing exercises	Induction motor protection devices and the use of timers	acquiring skills Technical expertise on the subject of unity	4	eighteenth
Ongoing	Performing	Changing the final motor terminal connection from star to delta	acquiring skills	4	nineteenth

assessment	exercises	The motor originally operates in Y mode – Δ note the differences in current and torque in both cases	Technical expertise on the subject of unity		
Ongoing assessment	Performing exercises	Single-phase induction motor: A practical study of different types of single-phase induction motors – motor construction – capacitor motor – split-phase motor	acquiring skills Technical expertise on the subject of unity	4	Twenty
Ongoing assessment	Performing exercises	Winding a split-phase motor, performing necessary tests on it, and methods of periodic maintenance – faults and methods of repair – reversing the direction of rotation of the motor	acquiring skills Technical expertise on the subject of unity	4	Twenty first–
Ongoing assessment	Performing exercises	– Drawing files for a split-phase motor multiple examples	acquiring skills Technical expertise on the subject of unity	4	Twenty – second
Ongoing assessment	Performing exercises	Winding a shaded pole motor of various types	acquiring skills Technical expertise on the subject of unity	4	third –
Ongoing assessment	Performing exercises	Continuity test – Polarity test – Ground contact test – Short circuit test	acquiring skills Technical expertise on the subject of unity	4	Twenty fourth–
Ongoing	Performing	Electrical and mechanical faults and methods of repairing them	acquiring skills	4	Twenty fifth–

assessment	exercises		Technical expertise on the subject of unity		
Ongoing assessment	Performing exercises	Winding the capacitor-type motor involves performing the necessary tests polarity continuity test – grounding test – short circuit between windings –	acquiring skills Technical expertise on the subject of unity	4	Twenty sixth–
Ongoing assessment	Performing exercises	Winding the ceiling and table fan motors and performing the necessary tests	acquiring skills Technical expertise on the subject of unity	4	Twenty – seventh
Ongoing assessment	Performing exercises	Home appliance repair – Home refrigerator – Mechanical and electrical faults and how to fix them	acquiring skills Technical expertise on the subject of unity	4	Twenty eighth–
Ongoing assessment	Performing exercises	Home appliance repair – Home freezers Home air conditioners – Mechanical – – and electrical faults and their solutions Routine maintenance	acquiring skills Technical expertise on the subject of unity	4	Twenty ninth–
Ongoing assessment	Performing exercises	Home appliance repair – washing machine – electrical faults and their solutions – routine maintenance	acquiring skills Technical expertise on the subject of unity	4	thirty

11- Infrastructure:

Laboratory notebook for the workshop	1.Required textbooks
Winding electric motors, Dr. Qamar -1 Reference in electrical transformers -2SA Sticant , Franklin	2.Main references (sources)
Troubleshooting and maintenance of .1 electrical machinery. Prepared by the World .Bank for technical illustrations	a) Recommended books and references (scientific journals, reports, etc.)
1– Location of the Technical Institute/ Al- Rumaytha 2–Websites of global companies	b) Electronic references, websites...

12-Curriculum Development Plan :

- 1– Participating in various courses related to the subject to give the workshop trainers greater experience.
- 2– To learn about the latest advancements in modern technology in this field.
- 3– Preparing courses that develop the capabilities of trainers in the laboratory so that they can train students more efficiently.
- 4– Equipping laboratories with modern equipment that keeps pace with scientific developments in developed countries.

5- Electrical Installations – 2 :

electrical installation systems for various industrial purposes:electric motors , heating and cooling systems, lighting, calculations of equipped cables, preparation of quantity schedules.

Middle Al-Furat Technical Institute/ Al-Rumaytha Technical University	1-Educational institution
Electrical Engineering Department	2- Scientific Department/ Center
Electrical Installations – 2/ RELEC2005	3-Course Name/Code
Daily attendance is mandatory	4- Available forms of attendance
First and second semesters / Second year	5-Term / Year
hours per year 120	6- Number of study hours (total)
2025/10/15	7- Date this description was prepared
8- Course Objectives: The student will be able to: _____	
1–Knowledge of how to use electrical installation tools, power unit components, and devices used in building design such as heating, elevators, lightning arresters, and hazardous areas.	
2–Calculating the voltage drop values in the power transmission wires.	
3–How to choose electrical cables and identify faults in them.	
4– Knowledge of methods for implementing electrical projects, preparing estimated statements, and bills of quantities.	

9- Course outcomes, teaching and learning methods, and assessment :

A– Cognitive objectives : The student can learn:

- A1- The systems of different industrial establishments.
- A2 – Wiring systems used in factories and plants.
- A3 – Methods of establishing and installing electrical equipment.
- A4 – Methods of control and protection for different loads in electrical installations.
- A5– Types of electrical cables, their components, calculating cable size, identifying types of faults in them and the location of the fault.
- A6– The importance of grounding in electrical installations.
- A7 – Number of quantity schedules and estimated statements for electrical installations.

B - The specific skills objectives of the course:

B1– Acquiring the skill of setting up and installing electrical equipment.

B2 – Acquiring the wiring skills used in buildings, factories and workshops.

B3 – Acquiring the skill of designing and implementing control and protection methods for electrical installations

B4– Acquiring the skill of using testing equipment to identify the types and locations of faults in electrical cables.

B5 – Acquiring the skill of preparing bills of quantities for electrical projects.

Teaching and learning methods:

1– Theoretical lectures based on an educational package using appropriate technologies.

2– Laboratory experiments to study theories and calculations related to electrical installations.

3–Using measurement, control and protection devices for electrical installations .

4–Showing special scientific films about electrical installations .

5–Field visits to inspect the electrical installations of industrial plants .

Evaluation methods:

1. Students are assessed individually by giving them the opportunity to participate in class by answering questions.

2. Students are assessed collectively through daily exams with practical and theoretical questions.

3. Students are assessed collectively by being given extracurricular assignments such as writing personal reports or those related to practical experiments in laboratories.

4. Exams for the first and second semesters and final exams for the first and second rounds .

C- Affective and value-based objectives:

C1–Encouraging the development of students' professional and technical thinking .

C2– Working to develop a distinctive student personality by enhancing cultural and social awareness, which will enable him, after graduation, to contribute effectively to serving his community.

C3– Expanding the cognitive horizon and using brainstorming to generate ideas.

C4– Practical skills that enable the student to research and rationalize electrical energy consumption.

Teaching and learning methods:

1. Use modern methods to present theoretical and practical aspects, such as various electronic display devices, to attract attention and engage students so the ideas reach them more effectively.
2. Give students extracurricular assignments that require self-skills and interpretations to be tested.
3. Questioning students through discussion sessions by posing intellectual questions (how, why, when, where, etc.) i) For specific topics.
4. Using brainstorming and feedback techniques to activate students' accumulated experiences by linking what was learned in previous academic stages to new material.
5. To equip students with practical skills through conducting practical experiments on laboratory equipment.

Evaluation methods :

1. Evaluation based on the weekly lecture level
2. Weekly assessment of the practical aspect in the laboratory.
3. Theoretical and practical semester exams.
4. Final exam, both theoretical and practical.

D - General and transferable skills (other skills related to employability and personal development):

D1: Enabling students to prepare scientific reports.

D2: Enabling students to pass job interviews.

D3: Enabling students to conduct scientific development research that is directly related to our daily lives.

D4: Enabling students to pass professional tests organized by government agencies.

D5: Enabling students to engage in continuous self–development after graduation.

10- Course structure:

Evaluation Method	Teaching method	Unit/Topic Name	Required learning outcomes	Hours	Week
Live assessment + ent exams	+ Lectures Film Screenings + Practical Activities	Cables – Cable components and operating voltage, types of cables according to the type of) insulation MIMPVCTRSVRI and paper cables (.with a lead sheath	Understanding the subject of unity	4	the first
Live assessment + ent exams	+ Lectures Film Screenings + Practical Activities	Cable laying methods, possible cable faults, how .to identify the type and location of the fault	Understanding the subject of unity	4	the second
Live assessment + ent exams	+ Lectures Film Screenings + Practical Activities	Protection of electric motors, protection against overcurrents resulting from short circuits	Understanding the subject of unity	4	the third
Live assessment + ent exams	+ Lectures Practical	Protection against overcurrents due to increased loads	Understanding the subject of unity	4	Fourth
Live assessment + ent exams	+ Lectures Film Screenings + Practical Activities	Protection against phase loss or failure and protection against voltage drop	Understanding the subject of unity	4	Fifth
Live assessment + ent exams	+ Lectures Practical	Circuit breakers, their types (oil, sulfur (hexafluoride, vacuum, pneumatic	Understanding the subject of unity	4	Sixth
Live assessment + ent exams	+ Lectures Practical	Substations, vertical busbars, pneumatic switchboards, classification of alternating current control boards	Understanding the subject of unity	4	Seventh
Live assessment + ent exams	+ Lectures Practical	Lighting, principles of optical engineering, light sources, lighting systems and their types, light measuring devices	Understanding the subject of unity	4	Eighth
Live assessment + ent exams	+ Lectures Practical	Solved questions on how to design and calculate electrical lighting for halls, workshops, and courtyards	Understanding the subject of unity	4	Ninth

Live assessm + ent exams	+ Lectures Practical	Grounded and isolated systems: a comparison in case of fault, the advantages and .disadvantages of each system	Understan ding the subject of unity	4	tenth
Live assessm + ent exams	+ Lectures Practical	Voltage drop in single-phase and three-phase feeders, meaning of voltage drop, causes of voltage drop, damage resulting from voltage drop, testing feeder (cable) sizes, factors affecting current ratings	Understan ding the subject of unity	4	elevent h
Live assessm + ent exams	+ Lectures Practical	Solved questions on voltage drop calculations	Understan ding the subject of unity	4	twelfth
Live assessm + ent exams	+ Lectures Practical	Technical methods of wiring, a study of wiring systems, wiring methods, and techniques used .for this purpose	Understan ding the subject of unity	4	thirteen th
Live assessm + ent exams	+ Lectures Practical	Establishing hazardous areas (examples of hazardous areas): Specificities of establishing hazardous areas and the steps that must be .taken for this purpose	Understan ding the subject of unity	4	fourtee nth
Live assessm + ent exams	+ Lectures Practical	Grounding, its types, installation of ground conductors for substations and buildings, and lightning arresters	Understan ding the subject of unity	4	fifteenth
Live assessm + ent exams	+ Lectures Practical	Definition of electricity consumption (tariff), fixed and variable costs. Systems for calculating energy .consumption and various tariff systems	Understan ding the subject of unity	4	Sixteen th
Live assessm + ent exams	+ Lectures Practical	Energy meters, three-phase energy meter, its internal components and common faults, methods of connecting the meter, power factor measuring device, its components and operating theory	Understan ding the subject of unity	4	sevente enth
Live assessm + ent exams	+ Lectures Practical	Power factor, importance of power factor improvement, methods of power factor improvement, solved examples of how to calculate power factor	Understan ding the subject of unity	4	eightee nth
Live assessm + ent exams	+ Lectures Practical	.Electric heating, general principles of heat transfer methods of heat transfer, types of heaters, leakage through walls, thermal transfer coefficient of materials, thermal insulation, points to consider when calculating spaces and rooms	Understan ding the subject of unity	4	ninete nth
Live assessm + ent exams	+ Lectures Practical	Solved examples of heating calculations	Understan ding the subject of unity	4	Twenty

Live assessm + ent exams	+ Lectures Practical	Electric elevators: choosing the elevator location and type, tests to follow when selecting an elevator for a specific service (capacity, required .specifications, speed), calculating travel time .elevator efficiency, and service type	Understan ding the subject of unity	4	Twenty first–
Live assessm + ent exams	+ Lectures Practical	Types of elevators (passenger elevators, freight elevators: services), the main components of any .elevator (driver or carousel, motor, stops, car counterweight, indicators, controllers), safety .measures	Understan ding the subject of unity	4	Twenty – second
Live assessm + ent exams	+ Lectures Practical	Construction of the intake engine and reduction .ratio	Understan ding the subject of unity	4	Twenty third–
Live assessm + ent exams	+ Lectures Practical	The stopping group, the signaling system .associated with the elevator's ascent and descent	Understan ding the subject of unity	4	Twenty fourth–
Live assessm + ent exams	+ Lectures Practical	Types of motors used in elevators, specifications speed regulation for alternating current and direct .current motors	Understan ding the subject of unity	4	Twenty fifth–
Live assessm + ent exams	+ Lectures Practical	Safety precautions and friction stop for elevator .slippage. Elevator lower and upper springs .Lighting	Understan ding the subject of unity	4	Twenty sixth–
Live assessm + ent exams	+ Lectures Practical	Lightning arresters, how lightning occurs and discharges, specifications for good implementation of lightning arresters, protecting buildings and .facilities from lightning	Understan ding the subject of unity	4	Twenty – seventh
Live assessm + ent exams	+ Lectures Practical	A solved example based on the calculations of a .lightning protection circuit	Understan ding the subject of unity	4	Twenty eighth–
Live assessm + ent exams	+ Lectures Practical	Project implementation methods, tenders and their requirements, tender analysis and the foundations .upon which the tender depends	Understan ding the subject of unity	4	Twenty ninth–
Live assessm + ent exams	+ Lectures Practical	Estimation, its types, methods of estimating and appraising the materials needed for foundation work and the amounts required for it. Factors that affect .the cost of engineering work	Understan ding the subject of unity	4	thirty

11- Infrastructure:

1- The book "Industrial Electrical Installations" by Dr. Muzaffar Al-Na'ma, Nouri Bawi	1.Required textbooks
1- Electrical installation technology (by Thompson). 2- Electrical installation technology (by Michael Needle).	2.Main references (sources)
1- Electrical wiring of building (by Raphael & Needle . 2- Electrical lifts by Rs Philips. 3- Practice on low voltage switch gears (by Siemense Publication).	a) Recommended books and references (scientific journals, reports, etc.)
1-Technical Institute/ Rumaytha Location 2- Websites of global electricity companies ‘Like SiemensABB .	‘b) Electronic references ...websites

12-:Curriculum Development Plan

1. Continuous monitoring and updating of the vocabulary of the electrical installation materialsby the sectoral committees .
2. The teaching staff participated in development courses on electrical installations.
3. To learn about the latest advancements in modern technology in this field.
4. Preparing courses that develop the capabilities of trainers in the laboratory so that they can train students more efficiently.
5. Equipping laboratories with modern equipment that keeps pace with scientific development in developed countries so that there is greater compatibility between theoretical lectures and practical applications in the laboratory.

6 - Computer Applications -2 :

The student will be taught various computer applications: word processing , spreadsheets, calculations, and graphics programs. They will also learn about the internet and email.

Al-Furat Technical Institute/ Al-Rumaytha Middle Technical University	1-Educational institution
Electrical Engineering Department	2- Scientific Department / Center
- Computer Applications2 /RELEC2006	3-Course Name/Code
Daily attendance is mandatory	4- Available forms of attendance
First and second semesters / Second year	5-Term / Year
hours per year 60	6- Number of study hours (total)
2025/10/15	7- Date this description was prepared
8- Course Objectives :	
Teaching the student how to use the –1WORD2007 text editing program and how to work with tables, images, formats, page layout, and spell checking.	
2– Teaching the student the Excel 2007 system to use it for spreadsheets and performing calculations using functions and creating charts	
3–Teaching the student about types of networks, using the Internet, dealing with browsers, .search engines, and email	

4– Teaching the student to use the specialized electrical software ELECTRONICS WORKBENCH (MULTISIM)

9- Course outcomes, teaching and learning methods, and assessment:

A– Cognitive objectives:

A1– Introducing the student to using theWORD2007 text editing program and dealing with tables, images, formatting, page setup, and spell checking.

A2– Introducing the student to theEXCEL2007 system for use in tables, performing calculations, using functions, and creatingcharts.

A3– to the types of networks, the use of the Internet, and dealing with Introducing the student browsers, search engines, and email.

A4– use of the specialized electrical engineering program Defining the student's ELECTRONICS WORKBENCH (MULTISIM)

B - The specific skills objectives of the course:

B1– Acquiring computer skills and word processing softwareWORD2007

B2– Acquiring the skill of using theExcel 2007 spreadsheet program

B3– in performing calculations, using functions, and creating graphs in Acquiring skills Excel 2007

B4–using the Internet and dealing with browsers, search engines, and email Acquiring skills in

B5– Acquiring the skill to use the specialized electrical softwareMULTISIM

Teaching and learning methods:

- Theoretical lectures and practical applications
- presentations

Evaluation methods:

1. Students are assessed individually by giving them the opportunity to participate in class by answering questions.
2. Students are assessed collectively through daily exams with practical and theoretical questions.
3. Exams for the first and second semesters and final exams for the first and second rounds.

C- Affective and value-based objectives:

C1–Encouraging the development of students’ professional and technical thinking .

C2– Working to develop a distinctive student personality by enhancing cultural and social awareness, which will enable him, after graduation, to contribute effectively to serving his community.

C3–Expanding the cognitive horizon and using brainstorming to generate ideas .

C4–Practical skills that enable the student to use computer applications in future life.

Teaching and learning methods:

1. Using modern methods in presenting the theoretical and practical aspects, such as various electronic display devices, to attract attention and engage students so that the idea reaches the student better.
2. Giving students extracurricular assignments that require self–skills and interpretations to be tested.
3. Questioning students through discussion sessions by posing intellectual questions (how, why, when, where, etc.) i) For specific topics.
4. Using brainstorming and feedback techniques to activate students accumulated experiences by linking what was learned in previous academic stages to new material.
5. To equip students with practical skills through practical applications of computer programs.

Evaluation methods :

1. Evaluation based on the weekly lecture level.
2. Weekly assessment of the practical aspect in the laboratory.
3. Theoretical and practical semester exams.
4. Final exam, both theoretical and practical.

D - General and transferable skills (other skills related to employability and personal development) :

D1 – Enabling students to use computers in preparing scientific reports.

D2 – Enabling students to pass job interviews.

D3 – Enabling students to carry out scientific development research that is directly related to our daily lives.

D4 – Enabling students to pass professional tests organized by employers.

D5 – Enabling students to engage in continuous self-development after graduation.

Course structure -10:

Evalu ation Meth od	Teachin g method	Unit/Topic Name	Required learning outcomes	Hours	Week
Live assessm + ent exams	Lectures + Practical Applicatio ns	Working with MicrosoftWord 2007: Downloading the program, running it, its features, familiarizing yourself with the program interface, creating a new document (file), saving a new document opening a document	Understan ding the subject of unity	3	the first
Live assessm + ent exams	Lectures + Practical Applicatio ns	Editing commands: writing a new line navigating within a Word document , copying, cutting, and pasting, undoing and redoing clipboard , quick access toolbar , and ways to add and remove icons within .it	Understan ding the subject of unity	3	the second
Live assessm + ent exams	Lectures + Practical Applicatio ns	Setting page margins, paper size, font formatting, bulleted and numbered lists display methods, and screen zoom	Understan ding the subject of unity	3	the third
Live assessm + ent exams	Lectures + Practical Applicatio ns	Columns and Tables: Creating and formatting columns, methods for creating tables, specifying tables, columns, and rows, inserting columns and rows, deleting tables, columns, and rows, modifying columns and rows, merging and splitting cells, formatting tables, moving, resizing and adding an Excel table with a chart.	Understan ding the subject of unity	3	Fourth and fifth
Live assessm + ent exams	Lectures + Practical Applicatio ns	Borders and shading, spelling and grammar checking, thesaurus, translation translation screen hint Images and Objects: Insert and edit images, insert AutoShapes, insert WordArt text style , insert text box, insert equations , insert headers and footers, insert page numbers	Understan ding the subject of unity	3	Sixth and seventh

Live assessment + ent exams	Lectures + Practical Applications	Search and replace, create templates preview before printing, printing	Understanding the subject of unity	3	Eighth
Live assessment + ent exams	Lectures + Practical Applications	Working with Excel 2007 Accessing the : program, its features, familiarizing yourself with the program interface, formula bar status bar, worksheets bar, creating a new file, saving a file, opening a file	Understanding the subject of unity	3	Ninth
Live assessment + ent exams	Lectures + Practical Applications	Page layout in Excel: Page orientation margins, sheet, header and footer Display methods, page break control	Understanding the subject of unity	3	tenth
Live assessment + ent exams	Lectures + Practical Applications	Data types entered in Excel, how to enter data, copy, cut, paste, and paste special .functions	Understanding the subject of unity	3	eleventh
Live assessment + ent exams	Lectures + Practical Applications	Formatting commands: Alignment, Number formatting, Insert rows, columns, cells, and sheets, Delete rows, columns, cells, and sheets, Format rows, columns, and cells Organize sheets	Understanding the subject of unity	3	twelfth
Live assessment + ent exams	Lectures + Practical Applications	Hide and show rows, columns, and sheets .freeze rows and columns Arithmetic operations and their order function formulas, using the Autosum icon, the SUM , AVERAGE , MAX , MIN , and COUNT functions	Understanding the subject of unity	3	thirteenth The fourteenth
Live assessment + ent exams	Lectures + Practical Applications	IF conditional function , cloning function formulas, relative and absolute cells sorting and custom sorting in Excel	Understanding the subject of unity	3	fifteenth
Live assessment + ent exams	Lectures + Practical Applications	Creating charts (diagrams), previewing before printing, printing	Understanding the subject of unity	3	Sixteenth
Live assessment + ent exams	Lectures + Practical	Networks and their types, network forms network protocols	Understanding the subject of unity	3	seventeenth

	Applications				
Live assessment + ent exams	Lectures + Practical Applications	The Internet and its development, the Internet and intranet, firewalls, some basic Internet concepts	Understanding the subject of unity	3	eighteenth
Live assessment + ent exams	Lectures + Practical Applications	Connecting to the internet, opening an internet browser, internet browser window components, toolbars, browser icons	Understanding the subject of unity	3	nineteenth
Live assessment + ent exams	Lectures + Practical Applications	Web addresses, changing the homepage, closing the browser and disconnecting from the internet – saving favorite pages	Understanding the subject of unity	3	Twenty
Live assessment + ent exams	Lectures + Practical Applications	Search engines, how to search for information on the web, copying text and images from websites to any application	Understanding the subject of unity	3	Twenty first–
Live assessment + ent exams	Lectures + Practical Applications	Downloading files from the internet preparing for printing, printing	Understanding the subject of unity	3	Twenty – second
Live assessment + ent exams	Lectures + Practical Applications	Definition of email(E–MAIL) and its advantages, creating a Gmail account from the Google search engine writing a new message, attaching files to messages, reading the inbox replying to messages forwarding incoming messages, deleting messages	Understanding the subject of unity	3	Twenty third–
Live assessment + ent exams	Lectures + Practical Applications	Download ELECTRONICS WORKBENCH (MULTIZIM) software run the program program benefits	Understanding the subject of unity	3	Twenty fourth–
Live assessment + ent exams	Lectures + Practical Applications	Familiarizing yourself with the program interface, menu contents, and toolbars	Understanding the subject of unity	3	Twenty fifth –
Live assessment + ent exams	Lectures + Practical Applications	Create new files, save files, open files	Understanding the subject of unity	3	Twenty sixth–

Live assessment + ent exams	Lectures + Practical Applications	Identifying the equipment used in laboratory experiments; a button to resume and stop the circuit; and a button to start .and stop the designed circuit	Understanding the subject of unity	3	Twenty – seventh
Live assessment + ent exams	Lectures + Practical Applications	Identifying the electronic components used in drawing and how to change their properties	Understanding the subject of unity	3	Twenty eighth–
Live assessment + ent exams	Lectures + Practical Applications	How to draw electrical circuits with examples	Understanding the subject of unity	3	Twenty ninth–
Live assessment + ent exams	Lectures + Practical Applications	How to draw digital circuits (gates and (integrated circuits	Understanding the subject of unity	3	thirty

11- Infrastructure:

Textbooks	1.Required textbooks
References related to the subject and available at the Institute's library	2.Main references (sources)
Books and magazines related to the subject of : computers: basics, applicationsWord text ‘ editing programExcel spreadsheet and chart using ‘ preparation programAutoCAD program ‘ .the Internet and its applications	a) Recommended books and references (scientific journals,reports, etc.)
‘Institute website, various internet resources websites of international companies	b) Electronic references, websites...

12-Curriculum Development Plan:

- 1- Participating in various computer- related courses.
- 2- Accessing the latest advancements in computer technology applications.
- 3- Conducting development courses for laboratory staff that enhance their ability to train students more efficiently.
- 4- Equipping laboratories with modern equipment that keeps pace with scientific developments in developed countries.

7-The project:

The student (within a group of students) is tasked with preparing and implementing a graduation project on the subject of electrical power, in order to demonstrate his scientific capabilities and practical skills in a way that promotes teamwork among students.

Middle Al-Furat Technical Institute/ Al-Rumaytha Technical University	1-Educational institution
Electrical Engineering Department	2- Scientific Department/ Center
/ ProjectRELEC2007	3-Course Name/Code
attendance is mandatory Weekly	4- Available forms of attendance
First and second semesters / Second year	5-Term / Year
hours per year 60	6- Number of study hours (total)
2025/10/15	7- Date this description was prepared

8- Course Objectives:

The applicant will be able to :

- 1- He relies on himself to prove his scientific capabilities and practical skills.
- 2- It identifies the key objectives of the project.
- 3- He learns how to deal with a group of students in order to support teamwork.
- 4- It defines the work steps, analyzes them, and sets alternatives in case obstacles arise.
- 5- He draws up the steps and creates the designs for the project.
- 6- He monitors the progress of the project in terms of time.
- 7- He estimates the cost of the raw materials needed to build the project.
- 8- He sees and observes a simplified model of his work.
- 9- He learns to write the final project report in an organized manner, in the format of scientific research.

9- Course outcomes, teaching and learning methods, and assessment:

A– Cognitive objectives:

A1– Introducing the student to the prominent objectives of the project within the specialized projects in the field of electrical engineering.

A2– Introducing the student to how to deal with a group of students in order to support teamwork.

A3– Introducing the student to the work steps, analyzing them, and developing alternatives in case obstacles arise.

A4– Introducing the student to how to draw the steps and create designs for the project.

A5– Introducing the student to how to estimate the cost of raw materials needed to build the project.

A6– Defining for the student how to write the final project report in an organized manner in the format of research papers.

B - The specific skills objectives of the course:

B1– Acquiring the skill of how to distribute work within teamwork groups.

B2– Acquiring the skill of developing special designs and implementation steps for artistic projects.

B3 – Acquiring the skill of estimating the quantities and cost of raw materials needed to build artistic projects.

B4– Acquiring the skill of writing final reports for the preparation and implementation of artistic projects in an organized manner in the format of scientific research.

Teaching and learning methods:

1- Scientific research in sources related to the project topic in scientific books in available libraries.

2–Searching for sources on internet sites related to the project topic.

3–Using the equipment and devices available in laboratories and workshops.

: Evaluation methods

1– Students are evaluated individually through discussion and follow-up of the implementation steps by the project supervisor.

2–Evaluation of the practical aspect by the supervisor .

3– Examination of project students individually by project discussion committees formed in the department.

:C- Affective and value-based objectives

.A1– Encouraging the development of students’ professional and technical thinking

Working to develop a distinctive student personality by enhancing cultural and social –Part 2 awareness, which will enable him, after graduation, to contribute effectively to serving his .community

.Q3– Expanding the cognitive horizon and using brainstorming to generate ideas

Scientific and practical skills that enable the student to analyze technical problems in –Q4 .future life

Teaching and learning methods:

1– Scientific research in sources related to the project topic in scientific books in available libraries

2–Searching for sources on internet sites related to the project topic.

3–Using the equipment and devices available in laboratories and workshops.

4–Using computer software related to the project topic.

Evaluation methods :

1–Students are evaluated individually through discussion by the project supervisor .

2–Evaluation of the practical aspect by the supervisor.

3– Examination of project students individually with evaluation of the practical aspect by the project discussion committees formed in the department.

D - General and transferable skills (other skills related to employability and personal development) :

D1 – Enabling students to prepare scientific reports for the implementation of practical projects .

D2 – Enabling students to cooperate with others within teamwork groups.

D3 – Enabling students to carry out scientific development research that is directly related to our daily lives.

D4 – Enabling students to pass professional tests organized by employers.

D5 – Enabling students to be self-reliant in completing projects or developing solutions to technical problems within the field of electrical engineering.

10- Course structure:

Eval uatio n Met hod	Teaching method	Unit/Topic Name	Require d learning outcome s	Hours	mont h
Live assess ment	+ Lectures Practical Application s	Distributing projects to students, meeting with the supervising professor, and starting to review the library to obtain the resources related to the assigned project for the .students	Understan ding the initial steps required to work on the project	8	the first
Live assess ment	Lectures	.Gathering information about the project starting the theoretical study, and preparing the necessary designs for project .implementation	Starting with the theoretical aspect of the project	8	the second
Live assess ment	+ Lectures Practical Application s	Begin implementing the planned designs practically and conduct experiments and tests to obtain practical results. Test and .evaluate the previous stages	Starting with the practical side of the project	16	Third and fourth
Live assess ment	+ Lectures Practical Application s	Transferring laboratory experiments to final canvases to obtain the practical designed .model, conducting tests on the final model .and obtaining final results for discussion	Continuin g the practical aspect of the project	8	Fifth
Live assess ment	+ Lectures Practical Application s	Discussing the practical results and their compatibility with the actual results, and finding the necessary explanations for the .apparent cases	Completin g the practical aspect of the project	8	Sixth
Live assess ment	+ Lectures Practical Application s	The written sections of the report are arranged for each of the previous stages of :writing the final project report as follows - Project name - Supervising Professor - Student names - Summary - Chapter One: Introduction - Chapter Two: Theoretical Part	Writing the final project report	8	Sevent h

		- Chapter Three: Practical Part and Results - Chapter Four: Discussion of Results, Conclusions, and Recommendations – Sources			
The final results will be discussed by specialized committees		The project's working model will be submitted along with the final report for final .testing and evaluation	Project completion	8	Eighth

1- Infrastructure:	
	1.Required textbooks
References related to the project topic	2.Main references (sources)
According to the project topic	a) Recommended books and references (scientific journals, reports, etc.)
Institute website, various internet resources, websites of international companies	b) Electronic references, websites...

12-Curriculum Development Plan:

- 1- Providing the institute's library with books and studies on topics related to electrical technologies.
- 2- To learn about the latest advancements in modern technology for completing projects for students specializing in electrical power.
- 3-Providing the necessary equipment and supplies to complete the projects.
- 4- Equipping laboratories with modern equipment that enables students to complete projects related to electrical engineering topics.

8-Electrical drawing :

Teaching the student to draw and read various electrical diagrams using the AutoCAD computer program.

Middle Al-Furat Technical Institute/ Al-Rumaytha Technical University	1-Educational institution
Electrical Engineering Department	2- Scientific Department/ Center
/Electrical drawing RELEC2108	3-Course Name/Code
Daily attendance is mandatory	4- Available forms of attendance
First semester / Second year	5-Term / Year
hours per year 45	6- Number of study hours (total)
2024/10/15	7- Date this description was prepared
8- Course Objectives: The student will be able to: _____	
1-Recognizes electrical symbols and reads different electrical diagrams and circuits. 2-Learn how to draw symbols and connections for electrical installations, networks, and machines.	

9- Course outcomes , teaching and learning methods, and assessment:

A– Cognitive objectives:

- A1 – Introducing the student to the design of electrical circuits using a computer.
- A2– Introducing the student to how to draw and read different electrical diagrams.
- A3– Introducing the student to drawing operating circuits and circuits Control of electric motors.
- A4– Introducing the student to electrical symbols and reading different electrical maps and circuits.
- A5– Student Definition To how to draw the symbols and connections for electrical installations, networks, and machines.

B - The specific skills objectives of the course:

- B1 – Acquiring the skill of using computers in designing electrical circuits.
- B2 – Acquiring the skill of using AutoCAD software to draw electrical circuits.
- B3 – Acquiring a skill Using electrical symbols in drawing electrical diagrams.

Teaching and learning methods:

1. Theoretical lecture
2. Solving practical exercises on a calculator
3. Showing explanatory films along with the lecture
4. Using visual display devices
5. Giving daily homework

Evaluation methods:

1. Students are assessed individually by giving them the opportunity to participate in class by answering questions.
2. Students are assessed collectively through daily exams with questions and practical applications.
3. Assessing students collectively by assigning extracurricular tasks such as drawing electrical diagrams
4. Monthly and final exams.

C- Affective and value-based objectives:

C1–Encouraging the development of students’ professional and technical thinking .

C2– Working to develop a distinctive student personality by enhancing cultural and social awareness, which will enable him, after graduation, to contribute effectively to serving his community.

C3–Expanding the cognitive horizon and using brainstorming to generate ideas .

C4– Practical skills that enable the student to research how to design and draw electrical diagrams.

Teaching and learning methods:

1. Using modern methods in presenting the theoretical and practical aspects, such as various electronic display devices, to attract attention and engage students so that the idea reaches the student better.
2. Giving students extracurricular assignments that require self–skills and interpretations to be tested.
3. Complete electrical installation panels.
4. Solve practical exercises on electrical circuits.
5. Field observations of electrical control panels and their drawing in AutoCAD software (field visits).

Evaluation methods :

- 1- Direct assessment of classroom work and extracurricular assignments
- 2- short daily quizzes
- 3- Monthly exams
- 4- Final exam

D - General and transferable skills (other skills related to employability and personal development):

D1– Developing students' ability to visualize the shapes of motors and electrical devices in the designation of control panels.

D2– Enabling students to place symbols and numbering for electrical connections in a good and correct manner.

D3– Enabling students to analyze electrical diagrams .

D4–Enabling students to draw electrical power systems .

D5–Enabling students to pass job interviews.

D6– Enabling students to engage in continuous self–development after graduation.

10- Course structure:

Evaluation Method	Teaching method	Unit/Topic Name	Required learning outcomes	Hours	Week
Exercise assessment + ent monthly and final practical exams	Lectures + Practical Exercises	Drawing the electrical wiring diagram for a two-story building	The student's ability to practically apply the subject	3	the first
Exercise assessment + ent monthly and final practical exams	Lectures + Practical Exercises	Training students in tracing with ink and inking the previous painting	The student's ability to practically apply the subject	3	the second
Exercise assessment + ent monthly and final practical exams	Lectures + Practical Exercises	A drawing and preparation of the lists of required goods from the markets, their prices, quantities, and units, in order to determine the total cost of the electrical .installations for a three-story building The ground floor contains ten shops, and each floor contains four apartments, each independent of the others, and each apartment contains three rooms with .annexes	The student's ability to practically apply the subject	3	the third
Exercise assessment + ent monthly	Lectures + Practical Exercises	Explanation of electrical installations in ,various locations (laboratories workshops, public halls) using exposed and buried cables, along with the .creation of a diagram illustrating this	The student's ability to practically	3	Fourth

and final practical exams			apply the subject		
Exercise assessment + ent monthly and final practical exams	Lectures + Practical Exercises	Drawing a diagram of electrical connections for a three-phase transformer, type $W\Delta$ and Y.	The student's ability to practically apply the subject	3	Fifth
Exercise assessment + ent monthly and final practical exams	Lectures + Practical Exercises	Y- connected transformer using Mirza- .Bryce connectors	The student's ability to practically apply the subject	3	Sixth
Exercise assessment + ent monthly and final practical exams	Lectures + Practical Exercises	Diagram of the electrical wiring diagram for reversing the direction of rotation of a .three-phase induction motor	The student's ability to practically apply the subject	3	Sevent h
Exercise assessment + ent monthly	Lectures + Practical Exercises	Drawing the complete electrical wiring diagram for operating a three-phase .electric motor using Mirza-Bryce relays	The student's ability to practically	3	Eighth

and final practical exams			apply the subject		
Exercise assessment + ent monthly and final practical exams	Lectures + Practical Exercises	Drawing of a circuit diagram for a battery charger from a three-phase source	The student's ability to practically apply the subject	3	Ninth
Exercise assessment + ent monthly and final practical exams	Lectures + Practical Exercises	The complete installation of the distribution panel for a three-phase electric current generator whose internal poles are fed with direct current from a small generator mounted along the axis of the original generator. Measurement and protection devices are placed on the .drawing	The student's ability to practically apply the subject	3	tenth
Exercise assessment + ent monthly and final practical exams	Lectures + Practical Exercises	A diagram of the electrical wiring diagram for the compatibility process between a three-phase electric motor and the national electricity company should be drawn, and measuring and protection devices should be placed on .the diagram	The student's ability to practically apply the subject	3	eleventh
Exercise assessment + ent monthly	Lectures + Practical Exercises	Study and analysis of electrical maps electrical map systems, map tracing method – symbols and numbering	The student's ability to practically	3	twelfth

and final practical exams			apply the subject		
Exercise assessm + ent monthly and final practical exams	Lectures + Practical Exercises	Using an electronic calculator in drawing electrical diagrams	The student's ability to practically apply the subject	9	+ 13 + 14 15

11- Infrastructure:

Methodological vocabulary	1.Required textbooks
References available in the Institute's library	2.Main references (sources)
Various journals specializing in -1 computer applications Electrical installation diagrams -2	a) Recommended books and references (scientific journals, reports, etc.)
Institute website, internet resources, global company websites	b) Electronic references, websites...

12-Curriculum Development Plan:

1– Participating in various courses related to computer applications in the field of electrical diagram drawing. 2– Participation of teaching and training staff in training courses on electrical diagrams and the preparation of bills of quantities. 3–Providing high–performance computers so that each student can work on a separate computer.

9- Programmable Logic Controller (PLC)

It aims to introduce the student to modern factory and plant control methods.

Al-Furat Technical Institute/ Al-Rumaytha Middle Technical University	1-Educational institution
Electrical Engineering Department	2- Scientific Department/ Center
Programmable Logic Controller(PLC) / RELEC2209	3-Course Name/Code
Daily attendance is mandatory	4- Available forms of attendance
Second semester/Second year	5-Term / Year
hours per year 45	6- Number of study hours (total)
2025/10/15	7- Date this description was prepared
8- Course Objectives :	
1-Introducing the student to the principles of programmable logic controllers.	
2- To introduce the student to how to programmable logic control works on equipment and devices for various purposes.	

9- Course outcomes , teaching and learning methods, and assessment:

A- Cognitive objectives:

- A1- Introducing the student to the principles of how programmable logic controllers work.
- A2- Introducing the student to the advantages of using aPLC.
- A3- Introducing the student to the information storage system in thePLC.
- A4- Introducing the student toPLC instructions.
- A5- Introducing the student toPLC programming languages.

B - The specific skills objectives of the course:

B1– The student acquires PLC programming skills.

B1– The student acquires the skill of using the PLC for control purposes in factories and laboratories.

B2– The student acquires the skill of operating the PLC with peripheral devices.

B3– The student acquires the skill of maintaining PLC units.

B4– The student acquires the skill of setting up and wiring the PLC.

Teaching and learning methods:

1. Theoretical lectures
2. Practical applications
3. Field visits to workshops and laboratories

Evaluation methods:

1. Students are assessed individually by giving them the opportunity to participate in class by answering questions.
2. Students are assessed collectively through daily exams with practical and theoretical questions.
3. exams and final exams.

C- Affective and value-based objectives:

C1– Encouraging the development of students' professional and technical thinking .

C2– Working to develop a distinctive student personality by enhancing cultural and social awareness, which will enable him, after graduation, to contribute effectively to serving his community.

C3–Expanding the cognitive horizon and using brainstorming to generate ideas .

C4– Practical skills that enable the student to use PLC applications .in future life

Teaching and learning methods:

1. Using modern methods in presenting the theoretical and practical aspects, such as various electronic display devices, to attract attention and engage students so that the idea reaches the student better.

2. Giving students extracurricular assignments that require self–skills and interpretations to be tested.
3. Questioning students through discussion sessions by posing intellectual questions (how, why, when, where, etc.) i) For specific topics.
4. Using brainstorming and feedback techniques to activate students’ accumulated experiences by linking what was learned in previous academic stages to new material.
5. To equip students with practical skills through practical applications of PLC programs.

Evaluation methods:

1. Evaluation based on the weekly lecture level.
2. Weekly assessment of the practical aspect in the laboratory.
3. Monthly exams theoretical and practical .
4. Final exam, both theoretical and practical.

D - General and transferable skills (other skills related to employability and personal development) :

D1 – Enabling students to utilize the knowledge and skills acquired in future workplaces.

D2 – Enabling students to pass job interviews.

D3 – Enabling students to carry out scientific development research that is directly related to our daily lives.

D4 – Enabling students to pass professional tests organized by employers.

D5 – Enabling students to engage in continuous self–development after graduation.

10- Course structure:

Eval uatio n Meth od	Teachi ng metho d	Unit/Topic Name	Requir ed learnin g outcom es	Hours	Week
Live assess ment + exams	Lectures + Practical Applicat ions	Chapter 1 Introduction to Programmable Controllers 1-1 Definition 1-2 A Historical Background 1-3 Principles of Operation 1-4 PLCs Versus Other Types of Controls . 1-5 PLC Product Application Ranges . 1-6 Ladder Diagrams and the PLC 1-7 Advantages of PLCs	Understa nding the subject of unity	3	the first
Live assess ment + exams	Lectures + Practical Applicat ions	Number Systems and Codes 2-1 Number Systems 2-2 Number Conversions 2-3 One's and Two's Complement 2-4 Binary Codes 2-5 Register Word Formats ..	Understa nding the subject of unity	3	the second
Live assess ment + exams	Lectures + Practical Applicat ions	Chapter 3 Logic Concepts 3-1 The Binary Concept 3-2 Logic Functions 3-3 Principles of Boolean Algebra and Logic 3-4 PLC Circuits and Logic Contact Symbology	Understa nding the subject of unity	3	the third
Live assess ment + exams	Lectures + Practical Applicat ions	Processors, the Power Supply, and Programming Dev es 4-1 Introduction 4-2 Processors 4-3 Processor Scan 4-4 Error Checking and Diagnostics 4-5 The System Power Supply 4-6 Programming Devices	Understa nding the subject of unity	3	Fourth
Live assess ment + exams	Lectures + Practical Applicat ions	The Memory System and I/O Interaction 5-1 Memory Overview 5-2 Memory Types 5-3 Memory Structure and Capacity 5-4 Memory Organization and I/O Interaction	Understa nding the subject of unity	3	Fifth
Live assess ment + exams	Lectures + Practical Applicat ions	Configuring the PLC Memory — I/O Addressing 5-6 Summary of Memory, Scanning, and I/O Interaction 5-7 Memory Considerations .	Understa nding the subject of unity	3	Sixth
Live assess ment + exams	Lectures + Practical Applicat ions	The Discreet Input/Output System 7-1 Introduction to Discreet I/O Systems 7-2 I/O Rack Enclosures and Table Mapping 7-3 Remote I/O Systems . 7-4 PLC Instructions for Discreet Inputs 7-5 Types of Discreet Inputs .	Understa nding the subject of unity	3	Seventh

Live assessment + exams	Lectures + Practical Applications	PLC Instructions for Discrete Outputs 8-1 Discrete Outputs 8-2 Discrete Bypass/Control Stations 3 Interpreting I/O Specifications 8-4 Summary of Discrete I/O	Understanding the subject of unity	3	Eighth
Live assessment + exams	Lectures + Practical Applications	The Analog Input/Output System 9-1 Overview of Analog Input Signals 9-2 Instructions for Analog Input Modules . 9-3 Analog Input Data Representation . 9-4 Analog Input Data Handling 9-5 Analog Input Connections . 9-6 Overview of Analog Output Signals	Understanding the subject of unity	3	Ninth
Live assessment + exams	Lectures + Practical Applications	Instructions for Analog Output Modules 10-8 Analog Output Data Representation 10-9 Analog Output Data Handling 10-10 Analog Output Connections 10-11 Analog Output Bypass/Control Stations	Understanding the subject of unity	3	tenth
Live assessment + exams	Lectures + Practical Applications	Special Function I/O and Serial Communication Interfacing 11-1 Introduction to Special I/O Modules 11-2 Special Discrete Interfaces 11-3 Special Analog, Temperature, and PID Interfaces 11-4 Positioning Interfaces . 11-5 ASCII, Computer and Network Interfaces 11-6 Fuzzy Logic Interfaces .. 8-7 Peripheral Interfacing	Understanding the subject of unity	3	eleventh
Live assessment + exams	Lectures + Practical Applications	Programming Languages 12-1 Introduction to Programming Languages 12-2 Types of PLC Languages . 12-3 Ladder Diagram Format 12-4 Ladder Relay Instructions 12-5 Ladder Relay Programming 12-6 Timers and Counters 12-7 Timer Instructions	Understanding the subject of unity	3	twelfth
Live assessment + exams	Lectures + Practical Applications	Counter Instructions 13-9 Program/Flow Control Instructions 13-10 Arithmetic Instructions 13-11 Data Manipulation Instructions . 13-12 Data Transfer Instructions . 13-13 Special Function Instructions 13-14 Network Communication Instructions 13-15 Boolean Mne.	Understanding the subject of unity	3	thirteenth
Live assessment + exams	Lectures + Practical Applications	PLC System Documentation 14-1 Introduction to Documentation 14-2 Steps for Documentation 14-3 PLC Documentation Systems -4 Conclusion .	Understanding the subject of unity	3	fourteenth
Live assessment + exams	Lectures + Practical Applications	PLC Start-Up and Maintenance 15-1 PLC System Layout 15-2 Power Requirements and Safety Circuitry 15-3 Noise, Heat, and Voltage Considerations 15-4 I/O Installation Wiring, and Precautions	Understanding the subject of unity	3	fifteenth

11- Infrastructure:

Academic lectures	1.Required textbooks
References related to the subject and available at the institute's library	2.Main references (sources)
Books and scientific journals related to the subject of PLC ‘Basics, Instructions : Applications.	a) Recommended books and references (scientific journals, reports, etc.)
Institute website, various internet resources, websites of international companies	b) Electronic references, websites...

12-Curriculum Development Plan:

- 1- Participating in various courses related to PLC (Programmable Logic Controller) applications.**
- 2- Participation of teaching and training staff in training courses on PLC logic control applications.**
- 3- PLC devices So that the student can work on it.**

10- Arabic language /2 Course Description

The overall objective of this course is to familiarize the student with the English terminology in the field of the vocabulary of the accounting department's curriculum, in a way that enables him to understand the terms presented and deal with in the various fields related to the specialization in administrative and accounting aspects.

Learning outcomes, teaching and learning methods, and assessment

A- Knowledge and understanding

- 1- Getting acquainted with the rules of the Arabic language .
- 2- Identifying the original and secondary grammatical markers.
- 3-Getting acquainted with Quranic grammar and its miraculous nature .

b) Subject-specific skills

- So she This enables the student in the accounting department to master the rules of the Arabic language in various topics and to avoid making linguistic and spelling mistakes when expressing any of the ideas related to the courses he studies.

Teaching and learning methods

Theoretical and practical lectures

Display method

Assessment methods

- Oral and written tests

C- Thinking skills

- Discussion of intellectual topics
- Visual aids

Teaching and learning methods
- Intellectual questions
Assessment methods
- Oral and written tests
D - General and transferable skills (other skills related to employability and personal development)
- The student was made proficient in the rules and signs of the Arabic language, learning the correct pronunciation of the Arabic letters and choosing the appropriate words according to their positions in the grammatical sentences

11- English language /2

Course Description

This course description provides a concise summary of the course's key features and the expected learning outcomes for students, demonstrating whether they have made the most of the available learning opportunities . It must be linked to the program description

– Middle Euphrates University / Technical Institute Al-Rumaytha	• Educational institution
Electrical Engineering Department	• University Department/ Center
/ English language RELEC2211	• Course Name/Code
	• Programs that he enters
My presence	• Available forms of attendance
First + Second	• Semester/Year
1	• Total number of study hours
	• Date this description was prepared
• Course Objectives	
• Learning outcomes, teaching and learning methods, and assessment	
A- Knowledge and understanding A1- Identifying the times A2- Identifying sentence structure A3- Speaking fluently	
b) Subject-specific skills B1 - Listening B2 - Reading B3 – Understanding	

Teaching and learning methods
1- Educational videos 2- Data Show 3- Creating groups for discussion and skills development
Assessment methods
1- Daily exams 2- oral exams 3- semester exams 4- Final exams
C- Thinking skills
Teaching and learning methods
Assessment methods
D - General and transferable skills (other skills related to employability and personal development).

153. Infrastructure					
1. Course Name: English Language					
2. Course Code: METE239					
3. Semester / Year: Second year					
4. Description Preparation Date:					
5. Course Objectives					
Course Objectives				•	
				•	
				•	
6. Teaching and learning strategies					
Strategy					
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1& 2	2	Cognitive	getting to know you	Lecture and discussion	Question and answers
3&4	2	Cognitive	The way we live	Lecture and discussion	Question and answers

5&6	2	Emotional and cognitive	It all gone Wrong	Lecture and discussion	Question and answers
7&8	2	Emotional and cognitive	Let's go Shopping!	Lecture and discussion	Question and answers
9&10	2	Emotional and cognitive	What do you want to do?	Lecture and discussion	Question and answers
11&12	2	Emotional and cognitive	Tell me! What's it Like?	Lecture and discussion	Question and answers
13&14	2	Emotional and cognitive	Review	Lecture and discussion	Question and answers
15&16	2	Emotional and cognitive	Famous couples	Lecture and discussion	Question and answers
17&18	2	Emotional and cognitive	Do's and don'ts	Lecture and discussion	Question and answers
19&20	2	Emotional and cognitive	Going places	Lecture and discussion	Question and answers
21&22	2	Emotional and cognitive	Scared to death	Lecture and discussion	Question and answers
23&24	2	Emotional and cognitive	Things that Passives changed the world	Lecture and discussion	Question and answers
25&26	2	Emotional and cognitive	Dreams and reality	Lecture and discussion	Question and answers
27&28	2	cognitive	Earning a living	Lecture and discussion	Question and answers
29&30	2	Emotional and cognitive	Love you and leave you	Lecture and discussion	Question and answers