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

Academic Program and Course Description for Electrical department

2025

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Academic Program Description Form

University name : Al- Furat Al- Awsat technical university

Faculty/ Institute : Najaf technical Institute

Scientific Department : electrical technical

Academic or Professional Program Name : Diploma

Final Certificate Name : Diploma in Electrical power

Academic system : Annual

Description preparation Date : 29/3/2025

File completion Date :20/05/2025

Signature :

Head of Department Name :

Dr. Hasan W. Rabee

Date :25/3/2025

Signature:

Scientific Association Name:

Dr. Salah Mehdi Salih

Date:25/3/2025

This file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department :

Date: 04/06/2025

Dr. Abdullwahab Abdullarazaq

Approval of Dean

1. Program Vision

Excellence in qualifying technical cadres in the field of electricity technologies scientifically and practically to meet the needs of the labor market.

2. Program Mission

Preparing scientifically and professionally qualified human cadres in the field of electricity technologies capable of competing in the labor market in accordance with approved international quality standards.

3. Program Objectives

• Working to develop technical education through developing curricula and modernizing laboratories in accordance with good laboratory standards

• (GLP) is internationally accredited and involves the department's members in specialized qualification courses.

• Contributing to community service by holding courses and workshops in various electrical applications and promoting construction and reconstruction at a high level of quality.

• Exchanging theoretical and practical technical expertise with technical institutes and colleges with corresponding specializations and the labor market in the private sector.

• Providing an appropriate stimulating environment for learning and training.

• Providing engineering and technical consultations to all state departments and institutions and the private sector.

4. **Program Accreditation**
National Council for the Improvement of the Quality of Technical Engineering Education

5. **Program Accreditation**

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements	**4**	**10**	**8.4 %**	
College Requirements	**4**	**22**	**18.6 %**	
Department Requirements	**13**	**84**	**73 %**	
Summer Training	**1**	**0**	**0 %**	
Other				

7.Program Description					
Year/Level	Course Code	Course Name	Credit Hours		The kind of course
			Theoretical	Practical	
first	–	Electrical wiring	2	2	specialist
first	–	Electrical circuits and mesurment	2	2	specialist
first	–	electronic	2	2	specialist
		mathmatics	2		added
first	–	Engineering drawing			specialist
first	–	Human rise			general
second	–	Electrical machine	2	3	specialist
second	–	Electrical grids	2	2	specialist
second	–	Power electronic	2	3	specialist
second	–	Computer applications	1	2	added
second	–	Electrical drawing		3	specialist
second	–	PLC	1	2	specialist

8.Expected learning outcomes of the program	
Knowledge	
1- Acquiring theoretical knowledge in various sci-entific curricula related to the specialty. 2- Reading plans, drawings and designs. 3- Conducting theoretical calculations for various specialized issues. 4- Participate in designs and plans for air condition-ing devices.	1. The student will be able to understand electrical and electronic laws and theories 2. The student will be able to carry out all types of domestic and industrial electrical installations 3. The student will be able to understand, install and operate all types of electrical machines 4. The student will be able to perform maintenance on all electronic and electrical circuits and devices 5. The student will be able to draw and understand all electrical works and circuits 6. The student will be able to understand, maintain and operate electrical stations
Skills	
Practical maintenance and diagnosis of faults in elec-trical systems.	1 - The student will be able to study, understand, implement and maintain all domestic and industrial installations 2 - The student will be able to know all electronic and electrical symbols and study maps 3 - The student will be able to design, implement and maintain electronic and electrical circuits
Ethics	
Learning Outcomes 4	Learning Outcomes Statement 4
Learning Outcomes 5	Learning Outcomes Statement 5

9.Teaching and Learning Strategies
1- **Theoretical lecture** 2- **Discussion in the lecture** 3- **Submitting reports throughout the year via the Internet**

10. Evaluation methods
Implementing it in all stages of the program in general. 1- Daily and monthly testing 2- Oral test 3- Weekly laboratory reports

Professional Development
Mentoring new faculty members
Periodic meetings to hone academic and administrative skills and involve them in the main committees, courses and workshops related to the program and the institution in general.
Professional development of faculty members
Participating in academic courses and workshops, encouraging scientific research, local and international scientific participation, and community service.

11.Acceptance Criterion
The admission system is centralized by the Ministry and is subject to differentiation by the institution according to the vocational and preparatory secondary school grades.

12.The most important sources of information about the program
1- Development plan for the scientific department 2- Experience of members of the scientific department 3- Sectoral and advisory committees ABET accreditation program

13. Program Development Plan
Working to increase the department's capacity, develop laboratories and equip them with modern equipment to keep pace with the development of refrigeration and air conditioning devices in a way that is compatible with the labor market.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
first			basic												
		Electrical circuits and measurements	/	√		√		√	√		√		√	√	
		Electrical wiring	/		√			√		√	√		√		√
		Electronic	/	√		√		√	√		√		√	√	
		Workshop lab I			√		√		√	√		√	√	√	√
		Mathematics		√		√		√		√		√	√		
		Calculator applications				√		√	√		√		√		√
		Engineering and electrical drawing	/		√	√	√		√	√		√	√	√	
		Human rights		√		√					√			√	√
		occupational safety				√	√					√			√
		Digital Electronics		√		√		√		√	√		√	√	
		English language			√		√		√		√	√			
		Electrical machines		√	√	√		√	√		√		√	√	√
		Electrical grids		√	√	√		√	√	√	√	√	√		√
		Power electronic		√	√		√	√		√		√	√		
		Workshop II		√		√			√	√		√			√
		Electrical wiring II		√		√				√	√		√	√	
		Electrical drawing II		√		√			√		√		√	√	√

		PLC		√		√			√		√		√	√	
		Final graduation project		√		√			√	√	√		√	√	
		Computer applications II		√		√		√		√	√		√		√
		English language II				√		√		√		√	√		
		Albaath crimes			√		√					√			√

1. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Assistant Professor, Doctor	Electricity Engineering	**power**			√	
Assistant Professor, Doctor	Electricity Engineering	**Electronic**			√	
Teacher, Doctor	Electricity Engineering	**power**			√	
Lecturer, Doctor	Electricity Engineering	**Control and systems**			√	
Assistant teacher	Electricity Engineering	**power**			√	
Assistant teacher	Electricity Engineering	**power**			√	
Assistant lecturer	Electricity Engineering	**communication**			√	

Assistant lecturer	Electricity Engi–neering	**communication**			√	
Assistant lecturer	Electricity Engi–neering	**communication**			√	
Assistant lecturer	Electricity Engi–neering	**mathematics**			√	

Course description form

1. Course name: Electrical circuits and measurements	
2. Course Code: RELEC1001	
3. Semester/year: First/2024-2025	
4. Date this description was prepared: 29/3/2025	
5. Available attendance formats: In-hall attendance/ In lab attendance	
6. Number of study hours (weekly)/number of units: 120 hours/8 units	
7. Name of the course administrator (if more than one name is mentioned)	
Name: Azhar yousif Email	
8. Course objectives	
Objectives of the study subject	1. Apply general electrical laws when analyzing electrical circuits. 2 .Choose the most appropriate application when analyzing circuits with direct and alternating current. 3 .Identify the various basic electrical theories and perform mathematical applications on them 4. Connecting single-phase and three-phase equipment and dealing with various types of loads
9. Teaching and learning strategies	
The strategy	Theoretical lectures - practical lectures - scientific trips - daily, monthly and quarterly tests And scientific reports.

10. Course structure	
The week	**Required learning outcomes**
First	The system of units used in electricity and the units of measurement for each substance (its parts and multiples) - Mathematical applications for converting values using units - Definition of the basic units of voltage, current and resistance - Components of the electrical circuit - Ohm's law - Factors affecting the value of resistance - Specific resistance of conductive and insulating material - Effect of temperature On the value of resistance - the thermal coefficient of resistance with solutions to applied examples.
Second	DC circuits include: 1 .Connecting resistors in series with examples. 2 .Connecting resistors in parallel with examples. 3 .Mixed connection of resistors with examples. Star and triangle connection of resistors and conversion from each to the other with examples.
Third	Applications to series, parallel, mixed, star, and triangle circuits.
Fourth	Kirchhoff's Laws - Kirchhoff's law of current and voltage with applied examples.
Fifth	Maxwell's law with solutions and applied examples.
Sixth	Thevenin's theorem - definition of the theory - how to apply it in direct current.
Seventh	Norton's theory - definition of the theory - how to apply it in direct current.
Eighth	Practical examples of Thevenin and Norton theorems.
Ninth	Matching theory - definition of the theory - steps to apply it in solving direct current circuits that contain more than one source - solving definitional examples of current and voltage source (continuous power distributor) and how to convert from one to the other - theory of transferring the greatest possible power - definition of the theory - definition of the theory And deriving their relationships - examples.
Tenth	Alternating quantities: It includes defining the properties of alternating current - how to generate alternating current, its wave diagram, and its relationships - defining the effective RMS value and the average value and their relationships to find the formation factor and value factor for irregular waveforms with applied examples.
Eleventh	Alternating vector quantities - their definition - their phase and graphical representation - phase angle and how to find it - finding the resultant of vector quantities, including multiplication, division, addition and subtraction with applied examples.

Twelfth	The effect of alternating current on a circuit containing only resistance - a circuit containing only pure inductance - a circuit containing only pure capacitance - finding the phase angle between current and voltage for each circuit with examples.
Thirteenth	The effect of alternating current on a circuit containing (resistance and inductance in series - resistance and capacitance in series - resistance, inductance and capacitance in series) - finding the relationship between current and voltage in the three cases - phase angle - total impedance of the circuit with practical examples.
Fourteenth	The effect of alternating current on a circuit containing (resistance and inductance - resistance and capacitance - resistance, inductance and capacitance) in parallel - finding the relationship between voltage and current in the three cases - phase angle - total impedance of the circuit with applied examples.
Fifteenth	The using of resonance circuit in matching process between transmission lines
Sixteenth	Resonance circuits include series resonance and parallel resonance circuits (defining the state of resonance and how to reach it - calculating current, voltage, impedance, phase angle and frequency at resonance - finding the beam width - quality factor - drawing the relationship between inductive and capacitive reactance with frequency - solving examples for both cases
Seventeenth	Applying the theories of Norton and Thevenin and congruence to alternating current circuits with solving examples.
Eighteenth	Power in alternating current circuits includes calculating power on circuits that contain (resistance only - inductance only - capacitance only - resistance, inductance and capacitance in series and parallel). Definition of active and inactive power and how to calculate them.
Nineteenth	Total apparent power (its definition) - how to draw a power triangle - power factor - its definition and its effect on alternating current circuits - how to improve the power factor with applied examples.
Twenty	The theory of transferring the greatest possible power in alternating current circuits - derivation of its relationship with applied examples.
Twenty-one	Practical methods for measuring resistors of high, medium and small values - using an ohmmeter in series and parallel - the ammeter and voltmeter method - the compensation method - using a Wheatstone bridge - the voltage divider method - the switching method - with examples of each method**.**
Twenty-two	Three-phase alternating current circuits - its definition and how to generate alternating current (one phase - two phases - three phases) with a drawing of each circuit. Star and triangular connections in

	three-phase alternating current circuits and special relationships for calculating line and phase current and voltage, total power and line power - phase power - Advantages of each connection when used in balanced and unbalanced loads, with examples.
Twenty-three	Solve applied examples of three-phase alternating current and triangular and star connections for balanced and unbalanced loads
Twenty-four	Methods for measuring power for three-phase loads - a wattmeter - how to connect it to a circuit to measure active power and calculate inactive power and apparent power with an example solution - measuring power using a wattmeter and a voltage - how to find the total power in this way and in the case of star and triangle connections - using two wattmeters - three wattmeters.
Twenty-five	Magnetism - the magnetic circuit - an introduction to North and South Pole magnetism - types of magnetic materials - the basic characteristics of magnetic materials and their definition, including the magnetic field - magnetic flux - magnetic driving force - magnetic flux density and factors that affect magnetic flux - permeability and its effect - magnetic circuits and application of Kirchhoff's laws on her
Twenty-six	Solve applied examples of magnetism
Twenty-seven	Self-inductance of the coil (electromagnetic induction) - its definition - special relations for finding the self-inductance of the coil - mutual inductance between two coils - relations for finding mutual inductance according to the type of connection of the two coils, and it includes a. Synergistic sequential linking. Reverse series connection.
Twenty-eight	Curves of growth and decay of current from an inductive circuit - explanation of this circuit and its effect on direct current - general relations for the growth and decay of current in the coil - drawing the current and calculating the time constant - solving examples - charging and discharging capacitors and including the use of capacitors in direct current circuits, general relationship for charging and discharging the capacitor and drawing the current The effect of time constant and its calculation - solving examples.
Twenty-nine	Measuring devices include - types of measuring devices - nature of their work - moving coil measuring devices - its installation and use in measuring voltage and current, mentioning its advantages and disadvantages, and a drawing of the device. The iron-core measuring device - its installation and how to use it in measuring - its advantages and disadvantages and drawing the device's diagram

Thirty	Wattmeter measuring devices - its installation - drawing a diagram of the device - its arrangement in the electrical circuit for measuring power - moment equations - its advantages - disadvantages - the oscilloscope device - drawing of the device - its installation - how to operate and use it

11. Course assessment	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc. The pursuit grade should be 50 and the final exam should be 50%.	
12. Learning and teaching References	
Main references	tallings, W.; Computer Organization and Architecture - esign for Performance; 5th ed
support references	
Electronic references, websites	

1. Course Name:
Electrical wiring
2. Course Code:
–
3. Semester / Year:
First year
4. Description Preparation Date:
29/3/2025
5. Available Attendance Forms:
Theoretical lecture, practical training
6. Number of Credit Hours (Total) / Number of Units (Total):
120hours (60 theoretical + 60 practical)
7. Course administrator's name (mention all, if more than one name)
Name: م.م علي كاظم عذافة Email:

8. Course Objectives	
Course Objectives	• **Identify the types of wires and electrical cables** • **Introducing the student to the various electrical installation systems** • **Identify the sizes and types of circuit breakers**

9. Teaching and Learning Strategies	
Strategy	• The student will be able to understand the types of electrical installations • The student will be able to understand, inspect and maintain all foundation circuits • The student will be able to learn about installing and operating all types of electric motors • The student will be able to supervise electrical installation work • The student will be able to examine the equipment used in all institutions

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
the first	**4**	The student will be able to know the vocabulary of the subject, the names of textbooks, and define the types of electrical materials	Introducing the student to the curriculum vocabulary for the subject and scientific sources	Theoretical lectures practical training	daily Monthly annual
the second	**4**	The student will be able to know the properties of both copper and aluminium	He wrote methodological and auxiliary books and his introduction to electrical conductive materials - semiconductors and insulators	Theoretical lectures practical training	daily Monthly Annual
the third	**4**	The student will be able to know about insulating materials and examples	Examples of conductive materials such as copper and aluminum	Theoretical lectures practical training	daily Monthly Annual
the fourth	**4**	The student will be able to know magnetic materials and their laws	Their advantages and uses - High-resistance alloys - Properties that make them good elements for electrical uses	Theoretical lectures practical training	daily Monthly annual
Fifth	**4**	The student will be able to apply the laws of Curchouf	Insulating materials - examples of insulating materials - air, oil	Theoretical lectures practical training	daily Monthly Annual
VI	**4**	The student will be able to know the mechanical properties of electrical materials	Its uses - solid insulating materials	Theoretical lectures practical training	daily Monthly Annual
Seventh	**4**	The student will be able to know the phases of electrical energy	Magnetic materials – associated terminology –	Theoretical lectures practical training	daily Monthly Annual
VIII	**4**	The student will be able to know the secondary station and distribution boards	Magnetic properties – laws related to magnetism	Theoretical lectures practical training	daily Monthly Annual

Ninth	4	The student will be able to know the types of electrical switches	Magnetic circuits and th application of Kirchhoff's laws to them. Examples	Theoretical lectures practical training	daily Monthly Annual
The tenth	4	The student will be able to identify fuses and their types	Solved on magnetism	Theoretical lectures practical training	daily Monthly Annual
Eleventh	4	The student will be able to know the types of cycle breakers	Mechanical properties o electrical materials (tensile,	Theoretical lectures practical training	daily Monthly Annual
Twelveth	4	The student will be able to identify the types o wiring systems and types of P.V.C insulation	Stress, elongation, elasticity) are solved examples	Theoretical lectures practical training	daily Monthly Annual
Thirteenth	4	The student will be able to identify the types o home foundations	The stages through which electrical energy passes from the generating station	Theoretical lectures practical training	daily Monthly Annual
Fourteenth	4	The student will be able to recognize and implement groundwork	Until it reaches the consumer	Theoretical lectures practical training	daily Monthly Annual
Fifteenth	4	The student will be able to use circuit breaker against ground leakage	Basic principles on how to process the consumer from a second ary station	Theoretical lectures practical training	daily Monthly Annual
sixteen	4	The student will be able to install and connect an electrical energy measuring device	– Dusty and industrial distribution panels – How to feed	Theoretical lectures practical training	daily Monthly Annual
Seventeenth	4	The student will be able to become familiar with the rules of electrical installations	Large building with elec tricity	Theoretical lectures practical training	daily Monthly Annual
Eighteen	4	The student will be able to learn about methods of inspecting and testing all	Types of switches used in electrical installations	Theoretical lectures practical training	daily Monthly Annual

		electrical in-stallations			
Nineteenth	**4**	The student will be able to know and lo-cate the electri cal fault	Single-pole, two-way, middle, bi-pole switch,	Theoretical lectures practical training	daily Monthly Annual
The twentieth	**4**	The student will be able to iden tify and exam-ine alarm and warning cir-cuits	tripolar	Theoretical lectures practical training	daily Monthly Annual
21st	**4**	The student will be able to rec-ognize open and closed cir-cuits	Protection devices used in installations, fuses	Theoretical lectures practical training	daily Monthly Annual
twenty tow	**4**	The student will be able to use and connect th hotel paging system	And its types - separator	Theoretical lectures practical training	daily Monthly Annual
twenty third	**4**	The student will be able to iden tify the types o engines	Small circuit breakers and how to distribute loads within the building	Theoretical lectures practical training	daily Monthly Annual
twenty fourth	**4**	The student will be able to iden tify alternating current motors	Through the distribution panel	Theoretical lectures practical training	daily Monthly Annual
25th	**4**	The student will be able to learn about the the-ory of opera-tion of all en-gines	Electrical wiring system B.B. non-insulated conductor system	Theoretical lectures practical training	daily Monthly Annual
twenty-sixth	**4**	The student will be able to iden tify the types o switches, in-cluding Star and Delta	T.R.S strong rubber strapping system con nector system	Theoretical lectures practical training	daily Monthly annual
27th	**4**	The student will be able to iden tify the types o stoves and thei operation	Insulated with (P.V.C) insulated conductor system	Theoretical lectures practical training	daily Monthly Annual
Twenty-eighth	**4**	The student will be able to iden tify the therma relay against surge current	By (P.C.P)	Theoretical lectures practical training	daily Monthly Annual

XXIX	**4**	The student will be able to learn about time tracking and business theory	Types of home foundations - safety conditions - cost -	Theoretical lectures practical training	daily Monthly Annual
Thirty	**4**	The student will be able to remember all previous material	The required durability, appearance and general appearance of the foundation -	Theoretical lectures practical training	daily Monthly annual

11. Course Evaluation

The first semester (10 theoretical + 10 practical + 5 assessment) 25%,
the second semester (10 theoretical + 10 practical + 5 assessment) 25%,
annual endeavor 50%,
final theoretical 40%,
final practical 10%,
total 100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Related books from the Internet
Main references (sources)	1- Electrical Installation Technology By : Thompson 2- Electrical Installation Technology By : Michael Neidle 3- Practice on Low Voltage Switch Gears By : siemense Publication
Recommended books and references (scientific journals, reports...)	1- All relevant books approved by other institutes and universities with the same specialty 2-Books from the Internet
Electronic References, Websites	All websites that contain the above books

1. Course name: Electronic	
2. Course Code: RELEC1003	
3. Semester/year: First/2024-2025	
4. Date this description was prepared: 29/03/2025	
5. Available attendance formats: In-hall attendance/ In lab attendance	
6. Number of study hours (weekly)/number of units: 120 hours/8 units	
7. Name of the course administrator (if more than one name is mentioned)	
Name: Haron Rasheed Email: safaa.hamood	
8. Course objectives	
Objectives of the study subject	Introducing the student to the various electronic components -The student will be able to become familiar with: electronic components manufactured from semiconductors in different Its types - composition - properties - uses in electronic circuits - applications - downloading special electronic circuits It includes optoelectronic components and their applications.
9. Teaching and learning strategies	
The strategy	Theoretical lectures - practical lectures - scientific trips - daily monthly and quarterly tests And scientific reports.

10. Course structure	
The week	**Required learning outcomes**
First	The theory of semiconductors - atomic structure - energy levels - electrophoresis - conduction in electrophoresis - Gap current – how gaps move
Second	Inoculation - positive crystal (P type) negative crystal (N type) current of electrons and current of holes - total resistance
Third	Semiconductor diodes - PN stain (vacuum zone formation - good barrier - energy hill- Thermal effects - Biased Bias - Forward Bias - Reverse Bias - Properties Curves In the forward and reverse directions - evanescent crossing current - peak carrier current - leakage current Surface - Good refractive index - Good luminescence (PIV) (maximum forward current - greatest reverse current- (PIVmax – (the equivalent circuit of a diode
Fourth & Fifth	The binary as a current unifier - a half-wave unifier - the continuous value of a current and mathematically - the effective value Output frequency
Sixth	Unifying the cam wave - using the center branch transformer - the bridge unifier - calculating the values Continuous and effective current - Extracting the output frequency - Comparison between the half-wave uniform and the wave uniform Quantity – Comparison of quantized wave units.
Seventh	. Filters - capacitor filtration - LC filter (RC filter) - good continuous output
Eighth	The ripple factor is a good multiplier. Circuits of induction - positive induction - negative induction - combined induction
Ninth & Tenth	Zener diode - structure - symbols - properties - dielectric refraction Zener refraction - good refraction- Power tolerance - zener impedance - temperature effects - zener approximation, continuous good regulation
Eleventh	bipolar transistor - its structure - bias regions - dc)α) - (βdc) - the relationship between dc)α and (βdc) - types of bias - connection formulas - equivalent circuit of the transistor .
Twelfth	Transistor characteristic curves - working areas - definition of (Icbo) and (Iceo) - current gain curve -The relationship between (IC) and (Icbo

Thirteenth|h Four-teen&	transistor bias - base bias - emitter bias - collector bias - self-bias- Feedback bias - voltage divider bias - applied examples
Fifteenth	Continuous equivalent circuits for the transistor - DC load line
Sixteenth	Action points - Quiet point (Q-point) - Practical examples
Seventh, eighth and Nineteenth	Transistors in small signal amplification - alternating equivalent circuit - hybrid constants (h-parameter) - voltage gain - current gain - power gain - input and output resistors - amplifiers The small signal has a common base and a common emitter
Twenty	Using a transistor in voltage regulation - a series voltage regulator - a parallel voltage regulator - a source circuit DC voltage – power supply
Twenty-one &Twenty-two	first Junction field-effect transistor (JFET) - its structure and symbol - theory of operation - characteristic curves - exchange conductivity curve - definition of narrow voltage (VP) and current (Idss) - characteristic curves (MOSFET)
	Three-phase alternating current circuits - its definition and how to generate alternating current (one phase - two phases - three phases) with a drawing of each circuit. Star and triangular connections in three-phase alternating current circuits and special relationships for calculating line and phase current and voltage, total power and line power - phase power - Advantages of each connection when used in balanced and unbalanced loads, with examples.
Twenty-three, fourth and twenty-fifth	Transistor bias circuits (FET) - constant current source bias - working point - self-bias - equivalent circuit for (FET) in small signal amplification - comparison between types of (FET) and (BJT)
Twenty-six	Light-dependent resistor (LDR) - light-emitting diode - photodiode - phototransistor - seven-block board, its structure and applications
Twenty-seventh and twenty-eighth	Unified Silicon Controller (SCR) - structure - symbol - properties - theory of operation - Triac - Dayac Their composition, their symbol, their working properties - a comparison between thyristors, diacs and triacs - thyristor protection Diac and triac – protecting thyristors from (voltage, voltage change, current, current change)
Twenty-nine and Thirty	Integrated circuits - their meaning - an idea about their manufacture and installation - their advantages and disadvantages - the operational amplifier (741) - the symbol of the connecting terminals

	- its uses - its applications in amplifying small signals - combining the two signals - a differentiator - an integrator - a template

11. Course assessment	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc. The pursuit grade should be 50 and the final exam should be 50%.	
12. Learning and teaching References	
Main references	Stallings, W.; Computer Organization and Architecture – Design Performance; 5th ed
support references	
Electronic references, web sites	

1. Course Name: Laboratories
2. Course Name/Code: RELEC1004/1
3.Semester/ Year: 2023-2024
4. Date of preparation of this description: 29/ 03/2025
5. Available Forms of Attendance: Indoor Attendance
6- Total number of academic hours: 180 hours
7. Course Administrator Name
Name: Assistant Lecturer. Ali Kadhim **Email** ali.outhafa.inj@atu.edu.iq :
8. **Course Objectives**: **The student will be able to:**
1. It uses different devices, tools and components used in workshops.
2. Acquires skill and technical experience in the field of various electrical maintenance works.
3. Gains self-confidence to practice electrical artwork in tracking faults and learning how to fix them.
4. Distinguish and identify various electrical and electronic components and how to use them in the construction of different circuits.
5. Learn how to use the devices, tools and machines used in auxiliary workshops for electrical maintenance work.

9- Teaching and learning strategies

A- **Cognitive Objectives:**

A1- Qualifying students of the Department of Electrical Technologies to be able to work in state departments or the private sector for various electrical maintenance and fault tracking.

A2- Qualifying students of the Department of Electrical Technologies to be able to distinguish between various electrical and electronic components and use them in building different circuits.

A3- Qualifying students of the Department of Electrical Technologies to be able to acquire skill and technical experience in the field of maintenance work.

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

B- **Course Skills Objectives :**

B1- Acquire skill and technical experience in the field of electrical maintenance.

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

B3- Ability to manage workshops for electrical machines.

- Developing the student's scientific and actual practice in identifying the types of manual winding machines or using the machine.

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

Teaching and learning methods:

1- Provide students with the basics and additional topics related to the previous learning outcomes of the Maha Art, to solve practical problems.

2- Apply the topics studied theoretically at the practical level in the various workshops of the department.

3- Establishing scientific uniforms and art for electrical maintenance workshops in production sites.

4- The use of manual tools, measuring tools and the ability to work and operate machines in an optimal manner.

5- Showing scientific films on the maintenance of electrical appliances.

Evaluation methods:
1. Continuous evaluation of students' work in the workshop. 2. Students are evaluated individually by giving the opportunity to participate in class by answering questions. 3. Students are evaluated collectively through daily exams with practical and theoretical questions. 4. Students are evaluated collectively by giving extracurricular assignments such as writing special reports or those related to practical experiences in the workshop.

10. **Course Structure:**					
Method Evaluation	**method education**	**Unit / Subject Name**	**Required Learning Outcomes**	**Hours**	**The week**
Assessment Continuous	1- Use the number and tools 2- implementation Exercises	**Cold Workshop**	Introducing the student to the importance of the workshop, working with it, the number and tools		First + Second + Third
Assessment Continuous	1- Use the number and tools 2- implementation Exercises	**Welding workshop**	Introducing the student to the importance of the workshop, working with it, the number and tools	6	IV + V + VI
Assessment Continuous	1- Use the number and tools 2- implementation Exercises	**Plumbing Workshop**	Introducing the student to the importance of the workshop, working with it, the number and tools	6	Seventh + Eighth + Ninth
Assessment Continuous	1- Use the number and tools 2- implementation Exercises	**Map Workshop**	Introducing the student to the importance of the workshop, working with it, the number and tools	6	Tenth + Eleventh + Twelfth
Assessment Continuous	1- Use the number and tools 2- implementation Exercises	**Carpentry workshop**	Introducing the student to the importance of the workshop, working with it, the number and tools	6	Thirteenth + Fourteenth + Fifteenth
Assessment Continuous	1- Use the number and tools 2-implementation	Basic principles in industrial security that the student needs within the workshop to protect him from electric shocks and the optimal	1- Using the equipment and tools in the workshop	6	Sixteenth

	Exercises	Identify the standard diameters of the wires used using tables and how to find equivalent wires from the same metal or from other metals in the absence of sizes of wires and training on the use of devices inside workshops and training on the use of micrometers to measure the diameters of the wires used in the file as well as training on the use of ferrnia for general measurements	2- Acquire skill and technical experience in the subject of the unit		
Assessment Continuous	1- Use the number and tools 2- implementation Exercises	Training on the welding process well using the electric caustic (with different codities) and identifying the caustic parts of the types of insulation and insulators, isolating the coils from the body, isolating the coils from each other, isolating the wires themselves and their applications	1- Using devices and tools in the workshop 2- Acquire skill and technical experience in the subject of the unit	6	Seventeenth
Assessment Continuous	1- Use the number and tools 2- implementation Exercises	The different types of resistors, the materials used in their manufacture, methods of coding, preferred values of resistors, how to check resistors, variable resistors, their types, classification, examination and uses, some special resistors, VOR, PTC, NTC and their uses, replacing damaged resistors and things to consider in that, the different types of amplitudes, how to manufacture them, methods of coding amplitudes, checking amplitudes, replacing damaged amplitudes and things to consider in that, building a differential circuit and integrator using a resistor and dilator and examining it	1- Using devices and tools in the workshop 2- Acquire skill and technical experience in the subject of the unit	6	Eighteenth
assessment continuous	1- Use the number and tools 2- implementation Exercises	Different types of coils, manufacturing, examination, methods of coding and reading the inductance of the coil, electrical transformers as an application to files, types and uses, methods of examination, construction of the joint circuit and the integrator using resistance and inductance and examination. Semiconductors, diode, method of examination and determination of its poles, Uses Zener diode, Properties, uses as variable amplitude, building and examining a unified half-wave circuit. Transistor, method of examination, determination of its quality, NPN, PNP, determination of its poles, emitter, collector, base, transistor numbering systems, European system, American system, finding equivalents between different systems in numbering the transistor	1- Using devices and tools in the workshop 2- Acquire skill and technical experience in the subject of the unit	6	Nineteenth

assessment continuous	1- Use the number and tools 2- implementation Exercises	Printed and ordinary boards used in the construction of electronic circuits, how to punch them, how to design electronic circuits and install them on printed boards, welding on printed boards, installing various electronic components and welding them on the printed board, dismantling electronic circuits installed on the printed board and lifting	1- Using devices and tools in the workshop 2- Skill acquisition	6	20th
		Components, cleaning of printed board and tools used. Training on making wooden molds with an equal step, with a different step and getting to know metal molds	and technical expertise in the subject of unity		
assessment continuous	1- Use the number and tools 2- implementation Exercises	Training on making files using different types of manual winding, mold winding and package wrapping methods	1- Using devices and tools in the workshop 2- Acquire skill and technical experience in the subject of the unit	6	Atheist Twenty
assessment continuous	1- Use the number and tools 2- implementation Exercises	Study the parts of the water pump for air cooler and identify the types of mechanical and electrical faults and methods of treatment, how to reverse the direction of rotation of the engine. Disassembling and assembling the water pump parts of the air cooler and operating them after reassembling and addressing errors, if any	1- Using devices and tools in the workshop 2- Acquire skill and technical experience in the subject of the unit	6	Second Twenty
assessment continuous	1- Use the number and tools 2- implementation Exercises	Training on drawing the water pump engine coils for air cooler, rewinding + coils, conducting types of tests, continuity testing	1- Using devices and tools in the workshop 2- Acquire skill and technical experience in the subject of the unit	6	Third Twenty
assessment continuous	1- Use the number and tools 2- implementation Exercises	Ground leakage test, shortness test in coils, polarity test test, engine operation and treatment of electrical and mechanical faults Study the theory of the work of the electric iron and its parts, training on dismantling and assembling iron parts and identifying the types of malfunctions and how to address them	1- Using devices and tools in the workshop 2- Acquire skill and technical experience in the subject of the unit	6	Fourth Twenty

assessment continuous	1- Use the number and tools 2- implementation Exercises	Studying the parts of the tabletop fan and training on dismantling and reassembling them and identifying mechanical and electrical faults and how to treat them. Studying the parts of the ceiling fan and training on dismantling and reassembling them and identifying mechanical and electrical faults and how to address them	1- Using devices and tools in the workshop 2- Acquire skill and technical experience in the subject of the unit	6	V Twenty
assessment continuous	1- Use the number and tools 2- implementation	Studying the types of transformers and identifying their parts, simplified design and winding of a single-output depressor transformer, installation and examination, as well as simplified design and winding of a depressor transformer with a middle output and its installation	1- Using devices and tools in	6	Sixth Twenty
	Exercises	and examined	Workshop 2- Acquire skill and technical experience in the subject of the unit		
assessment continuous	1- Use the number and tools 2- implementation Exercises	Simplified design and winding of a single output crane transformer, installation and inspection Simplified design and winding of a three-output crane transformer, installation and inspection	1- Using devices and tools in the workshop 2- Acquire skill and technical exتی perience in the subject of the unit	6	Seventh Twenty
assessment continuous	1- Use the number and tools 2- implementation Exercises	Study of split-faced engine parts, working theory, mechanical and electrical faults, methods of treatment and how to reverse the direction of rotation	1- Using devices and tools in the workshop 2- Acquire skill and technical experience in the subject of the unit	6	Eighth Twenty

11- البنية التحتية:	
Laboratory brochure for each workshop	**Required textbooks**
1. Winding electric motors, Dr. Qamar 2. Ref. in Electrical Transformers, S.A. Sticant, Franklin 3. Electronics in the service of electrical applications. Noel M. Morris	**Main references (sources)**
1. Identify faults and maintain electrical machines. Preparation of the World Bank for technical illustrations. 2. Foundations and maintenance of transistor circuits, by Larson	**books and references recommended by scientific journals, reports ...**
Global Corporate Websites	**Electronic references, websites....**

1- Participation in the various courses of the subject to give the workshop trainers more experience.

2- Access to the latest modern technology in the field of maintenance and repair of electrical appliances.

3- Preparing courses that develop the ability of trainers in workshops so that they can train students more efficiently.

4- Providing workshops with modern devices and equipment that keep pace with scientific development in developed countries.

1. Course name: Mathematics
2. Course code: RELEC1002
3. Semester / year: 2024 – 2025
4. Date this description was prepared: 29/3/2025
5. Available forms of attendance: attendance inside the lecture hall
6. Number of study hours (total) / Number of units (total): 120 hours / 2 units
7. Name of the course administrator
Name: Ass. Lec. Mohammed Faris Yousef Email: mu-hammed.fares.inj@atu.edu.iq
8. Course objectives

Objectives of the study subject	**1- Understands simple mathematical laws and equations.** **2- Applies laws in the field of electrical circuits.**
9. Teaching and learning strategies	
The strategy	**Scientific lectures - daily, monthly and quarterly tests and scientific reports**

10- Course structure

Week	Hours	Required learning outcomes	Name of the unit / topic	Teaching method	Evaluation method
First	2	Understand the topic of the unit	Matrices / determinants and their properties	Theoretical lectures & seminar	Direct evaluation & Written exams
Second	2	Understand the topic of the unit	Solving linear equations - Cramer's rule - Applications to determinants - Using the substitution method to find the value of currents in a multi-source electrical circuit	Theoretical lectures & seminar	Direct evaluation & Written exams
Third	2	Understand the topic of the unit	Vectors / Vector analysis / Vector and scalar quantities / Vector algebra / Calculations of vectors in space / Phase and directional representation of alternating quantities / phase angle / Finding the resultant of vector quantities	Theoretical lectures & seminar	Direct evaluation & Written exams
Fourth	2	Understand the topic of the unit	Unit of orthogonal vectors / vector scale / standard and directional multiplication / applications on vectors / magnetic flux / Maxwell / numerical multiplication of vectors using angles / numerical multiplication of vectors using coordinates	Theoretical lectures & seminar	Direct evaluation & Written exams

Fifth	2	Understand the topic of the unit	Function / Trigonometric functions and trigonometric relationships / Logarithmic functions / Calculating the DC current value for a semi-bridge circuit / Calculating the effective value of the line voltage / load of the transistor	Theoretical lectures & seminar	Direct evaluation & Written exams
Sixth	2	Understand the topic of the unit	Exponential function / Hyperbolic functions / Applications of drawing exponential functions for a first-order electrical circuit / Representing an R-C filter circuit with an exponential function	Theoretical lectures & seminar	Direct evaluation & Written exams
Seventh	2	Understand the topic of the unit	Limits / Limits of algebraic and trigonometric functions / Applications to Limits	Theoretical lectures & seminar	Direct evaluation & Written exams
Eighth	2	Understand the topic of the unit	Differentiation / derivative / derivative of algebraic functions / chain rule - building a differential circuit / calculating speed and acceleration - speed of light	Theoretical lectures & seminar	Direct evaluation & Written exams
Ninth	2	Understand the topic of the unit	Implicit function / higher-order derived standard function / representing a physical system with the implicit function	Theoretical lectures & seminar	Direct evaluation & Written exams
Tenth	2	Understand the topic of the unit	Derivative of trigonometric functions / Derivative of logarithmic functions / Calculating the effective value of the current in the R-L-C circuit / Bill voltage gain	Theoretical lectures & seminar	Direct evaluation & Written exams
Eleventh	2	Understand the topic of the unit	Derivative of exponential functions / derivative of hyperbolic functions / calculation of the time constant	Theoretical lectures & seminar	Direct evaluation & Written exams
Twelfth	2	Understand the topic of the unit	Applications of the derivative / tangent and perpendicular equation / speed and acceleration / change / calculations of the rate of change of voltage and current as a function of time	Theoretical lectures & seminar	Direct evaluation & Written exams
Thirteenth	2	Understand the topic of the unit	Increasing and decreasing / Maximum and minimum limits / Points of inflection / Graphing functions / Graphing the response of a second order circuit R-L-C	Theoretical lectures & seminar	Direct evaluation & Written exams
Fourteenth	2	Understand the topic of the unit	General physics and Geometric applications	Theoretical lectures & seminar	Direct evaluation & Written exams
Fifteenth	2	Understand the topic of the unit	Integration / indefinite integration / integration of algebraic and logarithmic functions / calculating the value of an expanding charge	Theoretical lectures & seminar	Direct evaluation & Written exams
Sixteenth	2	Understand the topic of the unit	Integration of exponential and trigonometric functions	Theoretical lectures & seminar	Direct evaluation & Written exams
Seventeenth	2	Understand the topic of the unit	Definite integration / Applications of definite integration / Area under the curve /Area between two curves / Electrical power calculations	Theoretical lectures & seminar	Direct evaluation & Written exams
Eighteenth	2	Understand the topic of the unit	Rotational volumes / arc length of the curve	Theoretical lectures & seminar	Direct evaluation & Written exams
Nineteenth	2	Understand the topic of the unit	Physical and Geometric applications (work - torque - momentum - moment of inertia)	Theoretical lectures & seminar	Direct evaluation & Written exams
Twentieth	2				

Twenty-first	2	Understand the topic of the unit	General methods of integration, including compensation, division, and the use of partial, exponential, and logarithmic fractions / building an integrator circuit using resistance and inductance / representing an electrical circuit with integral equations / an amplifier circuit using an integrated circuit	Theoretical lectures & seminar	Direct evaluation & Written exams
Twenty-second	2				
Twenty-third	2	Understand the topic of the unit	Numerical methods in integration / trapezoid rule / Simpson's rule / Finding the distance from acceleration and speed / finding the value of the effective current of a rectifier	Theoretical lectures & seminar	Direct evaluation & Written exams
Twenty-fourth	2	Understand the topic of the unit	Solving discrete, homogeneous and linear differential equations with their various applications within the field of specialization / positive, negative and compound pruning circuits	Theoretical lectures & seminar	Direct evaluation & Written exams
Twenty-fifth	2				
Twenty-sixth	2	Understand the topic of the unit	Complex numbers / addition, subtraction, multiplication and division / geometric representation of complex numbers / the relationship of electrical units to complex numbers	Theoretical lectures & seminar	Direct evaluation & Written exams
Twenty-seventh	2	Understand the topic of the unit	Polar formula / Converting the algebraic formula to polarity and vice versa / The relationship of the (j) coefficient to electronic circuits / The exponential formula in conversion /De Mouvre's theory and its use in solving complex electrical circuits / Power transmission line calculations using line constants	Theoretical lectures & seminar	Direct evaluation & Written exams
Twenty-eighth	2	Understand the topic of the unit	Powers and roots / Representing roots by graphic / Finding the roots of electrical circuits to determine stability / Delta – Star representation	Theoretical lectures & seminar	Direct evaluation & Written exams
Twenty-ninth	2	Understand the topic of the unit	Statistical operations / frequency distributions / histogram / frequency curve / probability and range / arithmetic and geometric mean / sample	Theoretical lectures & seminar	Direct evaluation & Written exams
Thirtieth	2	Understand the topic of the unit	Arithmetic mean / range and standard deviation / variance, dispersion and relative / relationship between mean, median and mode / coefficient of variation / standard variable	Theoretical lectures & seminar	Direct evaluation & Written exams

1. Course name: Calculator applications	
2. Course code:	
3. Semester / year: 2024 – 2025	
4. Date this description was prepared: 29/3/2025	
5. Available forms of attendance: attendance inside the lecture hall and laboratory	
6. Number of study hours (total) / Number of units (total): 120 hours / 2 units	
7. Name of the course administrator	
Name: Ass. Lec. Hussein Ali Mohammed Email: hussein.ali.inj@atu.edu.iq	
8. Course objectives	
Objectives of the study subject	**1- Introducing the student to the basics of the computer, the operatin system, and the most important commands. 2- Introducing the student to the physical and software parts of the co puter. 3- Introducing the student to how to install and delete programs and h to deal with the control panel. 4-The student learned to use the WORD 2007 text editing program, deal with tables, images, formats, prepare pages, check spelling, and so on.**
9. Teaching and learning strategies	
The strategy	**Scientific lectures - practical lectures - scientific trips - daily, monthly and quarterly tests And scientific reports.**

10- Course structure					
Week	**Hours**	**Required learning outcomes**	**Name of the unit / topic**	**Teaching method**	**Evaluation method**
First	3	Understand the topic of the unit	Introduction to computers, their benefits, generations, connecting the parts of the calculator, and identifying the physical components of the calculator and the means of input and output in it.	Theoretical lectures + practical application	Live assessment + written and practical exams
Second	3	Understand the topic of the unit	Software and identification of memory measurement units •Random Access Memory •Read Only Memory Definition of files and folders.	Theoretical lectures + practical application	Live assessment + written and practical exams
Third	3	Understand the topic of the unit	• System features and basic requirements to run the WINDOWS7 operating system. • Desktop concept and main desktop screen components. • Icons.	Theoretical lectures + practical application	Live assessment + written and practical exams
Fourth	3	Understand the topic of the unit	• How to deal with mouse and keyboard activities. • The importance of the components of the entry condition for Start. • Take advantage of the Taskbar. • Exit the system and turn off the calculator.	Theoretical lectures + practical application	Live assessment + written and practical exams
Fifth	3	Understand the topic of the unit	• My computer the concept of the window, learning about its main components, how to deal with icons, and how to define icons.	Theoretical lectures + practical application	Live assessment + written and practical exams
Sixth	3	Understand the topic of the unit	• Copy & Paste files and folders • Cut & Paste files. • The importance of knowing the Recycle Bin • My Documents.	Theoretical lectures + practical application	Live assessment + written and practical exams
Seventh	3	Understand the topic of the unit	• Properties of files and folders. • Creating folders and ways to rename them. • Delete files and folders	Theoretical lectures + practical application	Live assessment + written and practical exams
Eighth	3	Understand the topic of the unit	• Change the desktop background. • Change Windows Color. • Change time and date.	Theoretical lectures + practical application	Live assessment + written and practical exams
Ninth	3	Understand the topic of the unit	• Screen saver and its importance. • User Accounts. • System and Security.	Theoretical lectures + practical application	Live assessment + written and practical exams

Tenth	3	Understand the topic of the unit	• Work on supplementary programs: 1) Cutting tool. 2) Calculator. 3) The notebook. 4)The painter.	Theoretical lectures + practical application	Live assessment + written and practical exams
Eleventh	3	Understand the topic of the unit	• Learn about the Control Panel and how to delete and install programs. • The importance of Program And Features and its characteristics.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twelfth	3	Understand the topic of the unit	• The importance of the motherboard and what are its most important functions. • Mother Board components. • Processor, what is its importance and types.	Theoretical lectures + practical application	Live assessment + written and practical exams
Thirteenth	3	Understand the topic of the unit	• Bios. • External components: 1) Loyal ports. 2) PS ports. 3) Parallel ports. 4)USB ports.	Theoretical lectures + practical application	Live assessment + written and practical exams
Fourteenth	3	Understand the topic of the unit	• VIRUS. • Types of viruses in computers. • Symptoms of the device being infected with viruses.	Theoretical lectures + practical application	Live assessment + written and practical exams
Fifteenth	3	Understand the topic of the unit	• The effects of viruses on the computer. • Factors that help spread viruses. • Anti-virus programs. Anti-Viruses	Theoretical lectures + practical application	Live assessment + written and practical exams
Sixteenth	3	Understand the topic of the unit	• Working with the WORD7 program and how to download the program. • How to operate the program and learn about its features, uses, and importance. • Getting to know the program interface.	Theoretical lectures + practical application	Live assessment + written and practical exams
Seventeenth	3	Understand the topic of the unit	• Identify the most important bars in the program interface: 1) Title Bar 2) Menu Bar 3) Tools Bar 4)Status Bar 5) Active Window. • Create a new document (file), store a new document, open a document.	Theoretical lectures + practical application	Live assessment + written and practical exams
Eighteenth	3	Understand the topic of the unit	• Editing commands: a) Write a new line. b) Navigate within a Word document. c) Copy, cut and paste: Copy, cut, paste d) Undo and redo. • Viewing methods and zooming in and out of the screen	Theoretical lectures + practical application	Live assessment + written and practical exams

Nine-teenth	3	Understand the topic of the unit	• clip board • The importance of the quick access toolbar and ways to add and remove icons in it. The importance of horizontal and vertical rulers and how to display and hide them.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenti-eth	3	Understand the topic of the unit	• Setting page margins and paper size. • Font format: 1) Enlarge and reduce the font. 2) Font size. 3) Changing the font type, font color, and everything related to modifying the font. • Bullet and number numbers. Change the spacing between lines of text.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-first	3	Understand the topic of the unit	• Columns and tables: 1) Making and coordinating columns. 2) Methods of creating the table. 3) Define tables, columns and rows. Insert columns and rows.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-second	3	Understand the topic of the unit	• Columns and tables: 1) Delete tables, columns and arrays. 2) Edit columns and rows. 3) Merge and divide cells. 4) Format the table, move the table, zoom in and out. Add Excel table with Chart	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-third	3	Understand the topic of the unit	• Images and objects: 1) Inserting and modifying images. 2) Insert AutoShapes. 3) Insert a WordArt text style. Insert a text box	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-fourth	3	Understand the topic of the unit	• Insert a header and footer. • Incorporate page numbering. • Insert hyperlink. • Insert equations and symbols. Insert SmartArt.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-fifth	3	Understand the topic of the unit	• Working on page margins (narrow, reversed, etc.). • Set the orientation of pages in Word and work on choosing the size of the pages. • Adding a bookmark, the color of the pages, and how to create page borders.	Theoretical lectures + practical application	Live assessment + written and practical exams

10. Course evaluation

Twenty-sixth	3	Understand the topic of the unit	• Work on preparing a table for the sources contained within the WORD file.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-seventh	3	Understand the topic of the unit	• Boundaries and deception. • Spelling and grammar checking. • Dictionary of synonyms. •The number of words . • Translation screen tip.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-eighth	3	Understand the topic of the unit	• Ways to display documents: 1) Printing layout. 2) Reading in full screen mode. 3) Web layout. 4) Detailed plan. 5) Draft. Ways to hide and show horizontal and vertical rulers and grid lines.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-ninth	3	Understand the topic of the unit	• Ways to enlarge and reduce the page. • Create a new window. • Arranging more than one Word file. The importance of splitting a Word page.	Theoretical lectures + practical application	Live assessment + written and practical exams
Thirtieth	3	Understand the topic of the unit	• Search and replace. • Create templates. • Preview before printing. printing .	Theoretical lectures + practical application	Live assessment + written and practical exams

- ✓ First semester (10 theoretical + 10 practical + 5 evaluation) 25%,
- ✓ Second semester (10 theoretical + 10 practical + 5 evaluation) 25%,
- ✓ Annual pursuit 50% Final theoretical 50%
- ✓ Final practical 10%
- ✓ Total 100%

✓ 11. **Learning and teaching resources**

Required textbooks (methodology, if any)	
Main references (sources)	Calculator applications book written by Prof. Dr. Lama Naji, Hanan Farouk
Recommended supporting books and referenc (scientific journals, reports....	1- All relevant books approved by other institutes and universit with the same specialty 2- Books from the Internet
Electronic references, Internet sites	Website of the Najaf Technical Institute YouTube channels for teachers

1- Course name : Engineering and electrical drawing	
2- Course code	
3- Semester/year : First academic year 2024-2025	
4- The date this description was prepared : 29/03/2025	
5- Available forms of attendance: practical lecture, practical training	
6- Number of study hours (Total)/number of units (total): 90 hours/3 units	
7- Name of the course administrator:	
Name: Iman Lateef Muttashar Email: iman.muttashar@atu.edu.iq	
8- Course objectives	
Objectives of the study subject	- Introducing the student to the AutoCAD program and all its features. - Enable the student to draw using Auto-CAD.
9- Teaching and learning strategies	
- The strategy	• The student will be able to understand the method and principle of the program's work • The student will be able to understand how to use the program's instructions • The student will be able to read and understand any engineering or electrical drawing • The student will be able to draw all engineering and electrical shapes.

10- Course structure					
Week No.	Hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
First	3	The student will be able to get to know the Auto-CAD program interface, change interfaces, learn about the different program bars and how to hide and show them.	The importance of engineering drawing Learn about AutoCAD interfaces. Ways to execute AutoCAD commands, and ways to exit them. Navigate between interfaces, show menus, show and hide bars	Practical explanation + practical training	daily + Monthly + annual
Second	3	The student will be able to recognize drawing a rectum in different ways.	Methods of drawing a straight line using Cartesian coordinates, the relative method and the polar method.	=	=
Third	3	The student will be able to identify the method of saving the file, the display menu and the borders of the drawing interface page.	Display commands, dimensions of the working environment, drawing boundaries and units, save the file and then it can be opened in a previous version of the program using the following commands:	=	=

			Zoom, drawing limits, units, options		
Fourth	3	The student will be able to learn how to operate precision drawing commands and the nature of the work of each one of them.	Drawing accuracy orders SNAP, GRID, ORTHO, POLAR, OSNAP, OTRACK, DUCS, DYN, LWT) Drawing isometric objects using the Grid command	=	=
Fifth-Sixth	3	The student will be able to learn how to use the drawing element commands.	Element drawing orders: Rectangle, Circle, Polygon, Arc, Ellipse, Donut, Wipeout, Revision Cloud	=	=
Seventh	3	The student will be able to learn how to use modification commands.	Modification orders (Erase, Copy, Move, Mirror, Offset, Scale, Stretch, Rotate)	=	=
Eighth	3	The student will be able to identify all the Dimension menu commands	Setting different dimensions on drawing elements and controlling them using the Dimension Style dialog box: Linear, Aligned, Arc Length, Radius, Diameter, Angular, Mleader, Dimension Style… - Baseline, Continue,	=	=

Ninth	3	The student will be able to learn about changing drawing specifications in terms of line type, thickness, and color, in addition to transferring the characteristics of a specific element to another element.	Controlling drawing specifications (types of lines, colors of elements, their properties (Properties) and transferring properties to another element (Properties Match)	=	=
Tenth	3	The student will be able to learn how to draw various other important elements such as Spline	Other major element drawing orders: Polyline, Point, Spline, Helix, Table	=	=
Eleventh	3	The student will be able to familiarize themselves with the rest of the set of modification commands.	Other modification commands: (Array, Trim, Extend, Break, Fillet, Chamfer, Explode, Align)	=	=
Twelfth	3	The student will be able to learn about adding text to a drawing.	Adding Text Multiline & Single Line, and ways to control their specifications.	=	=
Thirteenth	3	The student will be able to learn how to calculate areas, volumes, and lengths of shapes.	Calculating areas, volumes, lengths, and coordinates of points Point ID and item specifications List using the Inquiry command , Handling Parametric bar orders	=	=

Four-teenth	3	The student will be able to recog-nize the indica-tions for dis-torting and dis-torting elements	Gradient, Hatch, and sectors.	=	=
Fif-teenth-Six-teenth	3	The student will be able to learn how to create multiple layers for a drawing.	Layers and con-trol their settings.	=	=
Seven-teenth-Eight-eenth	3	The student will be able to learn how to make and recall ready-made blocks for draw-ing.	Blocks, their types, inclusions, and control of their specifica-tions.	=	=
Nine-teenth	3	The student will be able to learn about converting 2D drawing to 3D.	Converting drawing from 2D to 3D commands Region, Bound-ary, Join	=	=
Twenty	3	The student will be able to recog-nize the orders of three-dimensional shapes.	Surfaces and ob-jects Basic 3D shapes commands (Box, Wedge, Cone, Sphere, Cylinder, Tours, Pyramid)	=	=
Twenty-one	3	The student will be able to recog-nize the com-mands for creat-ing three-dimen-sional objects.	Commands for creating 3D ob-jects (Extrude, Press/pull, Polysolid, Union, Subtract, Inter-sect, Revolve, Sweep, Loft)	=	=

Twenty-two	3	The student will be able to modify different objects and shapes using modification commands.	Commands for modifying objects Shell, Separate, Slice, Thicken Dealing with coordinate bar commands Ucs	=	=
Twenty-three	3	The student will be able to understand and draw projections.	Drawing projections, using program commands to display projections.	=	=
Twenty-four	3	The student will be able to recognize the nature of printing and print his own drawing.	printing	=	=
Twenty-five	3	The student will be able to recognize the drawing of electrical circuits.	Drawing electrical circuits Use the program library and use the symbols in the Design Center Center Draw symbols that are not in the program Save the symbols in a special file for use in new files.	=	=
Twenty six-Twenty seven	3	The student will be able to draw electrical and electronic circuits.	Draw some electrical and electronic circuits Draw input and output sine waves or any other wave	=	=
Twenty-eight	3	The student will be able to draw a drive circuit and a	Draw a drive circuit and control	=	=

		control circuit for a motor.	circuit for a motor.		
Twenty-nine	3	The student will be able to draw foundations for a residential house.	An example of the foundations of a small building or residential house.	=	=
Thirty	3	The student will be able to draw models of cable trays	Drawing models of cable trays.	=	=

11-	Course evaluation
First semester (20 practical + 5 assessment) 25%, Second semester (20+5 ratings) 25%, Annual pursuit 50% Final practical 50% Total 100%	
12-	Learning and teaching resources
- Supporting books for the purpose of examples	1- The book Principles of Electronics, written by Malvino, translated by Badr Muhammad and Dr. Riad Kamal. 2- Related books from the Internet.
- Recommended supporting books and references (scientific journals, reports....)	1- All relevant books approved by other institutes and universities with the same specialty 2- Books from the Internet.
- Electronic references, Internet sites	Website of the Najaf Technical Institute, YouTube channels for teachers

Course Description Form	
1- Course Name : Human Rights	
2- Course Code :	
3- Semester / Year : Annual	
4- Description Preparation Date : 2025	
5- Available Attendance Forms : In Class Attendance	
6- Number of Credit Hours (Total) / Number of Units (Total) : 60 h / 4 units	
7- Course administrator's name (mention all, if more than one name) :	
8- Course Objectives :	
Course Objectives :	**1- The student learns the laws and regulations related to human rights.** **2- The student learns about international human rights organizations.** **3- The student learns the foundations of litigation and claiming his rights in various cases.**
9- Teaching and Learning Strategies	
Strategy :	- Scientific lectures - Practical Lab. Experiments - Scientific trips - Daily, quarterly and monthly tests - Scientific reports.

10- Course Structure :					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject Name**	**Learn-ing Method**	**Evalua-tion Method**
Week 1	**2**	Human rights - definition - goals		Lecture s	**Daily Quizez and Oral Discussi on**
Week 2	**2**	The roots of human rights and their development in human history - human rights in ancient and medieval times.			
Week 3	**2**	Human rights in ancient civilizations, especially the Mesopotamian civilization. Human rights in divine laws, with a focus on human rights in Islam			
Week 4	**2**	Human rights in the Middle Ages: Human rights in political doctrines, schools, and theories - Human rights in corporations and their declarations, revolutions and constitutions (English documents - American Revolution - French Revolution - Russian Revolution)			
Week 5	**2**	Human rights in contemporary and modern history - international recognition of human rights since			

		World War I and beyond - United Nations)			
Week 6	**2**	Regional recognition of human rights - the European Convention on Human Rights 1950 - the American Convention on Human Rights 1969 - the African Charter on Human Rights 1981 - the Arab Charter on Human Rights 1994.			
Week 7	**2**	National human rights organizations			
Week 8	**2**	NGOs and human rights (ICRC - Amnesty International - Human Rights Watch)			
Week 9	**2**	National human rights organizations			
Week 10	**2**	Human rights in Iraqi constitutions between theory and reality			
Week 11	**2**	The relationship between human rights and public freedoms: - in the Universal Declaration of Human Rights.			

Week 12	**2**	In regional charters and national constitutions			
Week 13	**2**	Essential human rights and collective human rights.			
Week 14	**2**	Economic, social and cultural human rights and civil and political human rights			
Week 15	**2**	Modern human rights: facts in development - the right to a clean environment - the right to true solidarity.			
Week 16	**2**	Guarantees of respect and protection of human rights at the national level - guarantees in the constitution and laws - guarantees in the principle of the rule of law.			
Week 17	**2**	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.			
Week 18	**2**	Guarantees, respect and protection of human rights at the international level: - The role of the United Nations and its specialized agencies in providing guarantees.			
Week 19	**2**	The role of regional organizations - (Arab League - European Union - African Union -			

		Organization of American States - ASEAN)			
Week 20	**2**	General theories of freedoms - the origin of rights and freedoms - the project’s position on declared rights and freedoms - use of the term general freedoms.			
Week 21	**2**	The functional nature of the concept of public freedoms: philosophical considerations of the functional right - structural considerations of the positive right - economic considerations and public freedoms.			
Week 22	**2**	The legal rule of the state of law			
Week 23	**2**	The legal rule of the state of law			
Week 24	**2**	Regulation of public freedoms by public authorities			
Week 25	**2**	Non-judicial litigation or grievance			
Week 26	**2**	Judicial appeal - determining the state's responsibility for			

		implementing legitimacy			
Week 27	**2**	The impact of double judiciary on public freedoms according to administrative jurisprudence			
Week 28	**2**	Equality: the historical development of the concept of equality			
Week 29	**2**	The modern development of the idea of equality			
Week 30	**2**	gender equality Equality between individuals according to their beliefs and members.			

11- Course Evaluation	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as : - Daily preparation, daily oral Discussion and Contribution. - Monthly written exams, reports, etc. - The Accumulative grade through the year should be 50 degree - Final exam should be 50 degree.	
12- Learning and Teaching Resources	
Required Textbooks (Curricular books , any)	
Main References (Sources)	
Recommended Books References	
Electronic References - Websites	

10. Course: occupational safty
11. Assigned Password:
12. Semester / Year: 2024-2025
13. Date of preparation of this description: 29/3/2024
14.Available Forms of Attendance: Indoor Attendance
15.Number of credit hours (total) / number of units (total): 30 hours / 2 units
16. Course administrator name
Name: Assistant Lecturer. Faris Atiyah Mohammed Email: fares.mohammed.inj@atu.edu.iq

8.Course Objectives	Course Objectives
1- Introducing the student to occupational safety and its objectives 2- Introducing the student to maintenance and its objectives 3- Introducing the student to the occupational health and safety program and its sections. 4- Introducing the student to the types of fires and methods of extinguishing. 5- Introducing the student to industrial accidents and work risks (mechanical risks, electrical risks ,chemical hazards) 6- Introducing the student to protective and personal protective equipment.	

9.Teaching and Learning Strategies	
• Scientific lectures - daily, monthly and quarterly tests and student resear on the subject.	Strategy

Course Structure: 10.					
Evaluation method	**method education**	**Unit / Subject Name**	**Learning Out-comes Required**	**Hour**	**The wee k**
Live As-sessment	Theoretical lectures	• Occupational safety • Its necessities • Its objectives • Its return	understanding Module Theme	2	The first
Live As-sessment	Theoretical lectures	Occupational safety in terms of its impact on the person, family, department, facility, and na-tional economy	understanding Module Theme	2	Sec ond

Live As-sessment	Theoretical lectures	- Occupational safety, why? - The main factor, law enforce-ment. - Maintain skills . - Economic factor.	understanding Module Theme	2	Third
Live As-sessment	Theoretical lectures	• Maintenance • Its objectives • The importance of advance planning • The most important types of mainte-nance and when to use them	understanding Module Theme	2	Fou rth
Live As-sessment	Theoretical lectures	Maintenance organizations • Compare them • How to perform preventive and cura-tive systems	understanding Module Theme	4	Fift h
Live As-sessment	Theoretical lectures	• Formations of occupational health and safety departments	understanding Module Theme	2	Sixt h
Live As-sessment	Theoretical lectures	• General occupational health and safety programme	understanding Module Theme	2	Sev enth
Live As-sessment	Theoretical lectures	• Protect the work site • Protecting business methods • Worker protection	understanding Module Theme	2	Eigh th
Live As-sessment	Theoretical lectures	• Occupational health and safety programmer . • Jurisdiction . • Preventing traffic accidents • Accident statistics	understanding Module Theme	2	Nint h

Live Assessment	Theoretical lectures	• Fire and firefighting equipment	understanding Module Theme	2	Tenth
Live Assessment	Theoretical lectures	• Causes of industrial accidents • The importance and causes of accidents	understanding Module Theme	2	Eleventh
Live Assessment	Theoretical lectures + Pictures and movies of accident causes	• Encouraging interest in occupational health and safety • Mechanical risks	understanding Module Theme	2	Twelfth
Live Assessment	Theoretical lectures + Pictures and movies of accident causes	• Electrical accidents • Ways to prevent electrical accidents	understanding Module Theme	2	Thirteenth

Live Assessment	Theoretical lectures + educational films	• Chemical risks • Ways to prevent chemical accidents	understanding Module Theme	2	Fourteenth

Live Assessment	Theoretical lectures + display of pictures of the equipment	• Protective and personal equipment	understanding Module Theme	2	Fifteenth

11.Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student such as daily preparation and daily, oral, monthly, and written exams.

and reports .... Etc. The pursuit score should be 50 and the final exam should be 50%

12.Learning and Teaching Resources

• Basic principles of occupational safety, Rahim Turki Ali, Technical Education Authority/1992 • Industrial Management, Acer Soussan, Fares Jabaz Shalash, Technical Education Authority/1990	Required textbooks
• Occupational safety and safe isolation, Diaa Al-Qasimi, 1988	Main references (sources)
• Industrial security, accident prevention, Central Institute/Dersen, Engineer S. Darsen, translated by Muhammad Abdel Majeed Nassar.	Recommended supporting books and references. (Scientific journals, reports...)
www.safety-eng.com www.education.gov.bh\divions\safety	Electronic References, Websites

1. Course name: Digital Electronics	
3. Course Code	
4. Semester/year: second/2024-2025	
5. Date this description was prepared: 2025	
6. Available attendance formats: In-hall attendance	
7. Number of study hours (weekly)/number of units: 4 hours/4 units	
8. Name of the course administrator (if more than one name is mentioned)	
Name: Fares atea	Email:
9. Course objectives	
Objectives of the study sub-ject	Introduction to digital electronic circuits and their applications Learn the basics of logic circuits Learn to design digital systems Learn to implement digital systems
10.Teaching and learning strategies	
The strategy	Scientific lectures - practical lectures - scientific trips - daily, mo and quarterly tests and scientific reports.

11. Course structure	
The week	**Required learning outcomes**
First	**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
Second	**2 Binary Codes** 2. Binary Coded Decimal 2.1.1BCD-to-Binary Conversion 2.1.2Binary-to-BCD Conversion 2.1.3Higher-Density BCD Encoding 2.1.4Packed and Unpacked BCD Numbers 2.2Excess-3 Code 2.3Gray Code 2.3.1Binary–Gray Code Conversion 2.3.2Gray Code–Binary Conversion 2.3.3Gray Code
Third	**3Digital Arithmetic** 3.1Basic Rules of Binary Addition and Subtraction 3.2Addition of Larger-Bit Binary Numbers 3.2.1Addition Using the 2's Complement Method 3.3Subtraction of Larger-Bit Binary Numbers 3.3.1Subtraction Using 2's Complement Arithmetic 3.4BCD Addition and Subtraction in Excess-3 Code 3.4.1Addition 3.4.2Subtraction 3.5Binary Multiplication 3.5.1Repeated Left-Shift and Add Algorithm 3.5.2Repeated Add and Right-Shift Algorithm 3.6Binary Division

	3.6.1Repeated Right-Shift and Subtract Algorithm
Fourth	**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
Fifth	**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 Transistor Logic (TTL)
Sixth	**6-Boolean Algebra and Simplification Techniques** 6.1 Introduction to Boolean Algebra 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
Seventh	**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
Eighth	**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 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
Ninth	**9-Programmable Logic Devices** 9.1Fixed Logic Versus Programmable Logic 9.1.1 Advantages and Disadvantages 9.2 Programmable Logic Devices – An Overview
Tenth	**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 R-S Flip-Flop 10.3.1 R-S Flip-Flop with Active LOW Inputs 10.3.2 R-S Flip-Flop with Active HIGH Inputs 10.3.3 Clocked R-S Flip-Flop
Eleventh	**10.7.1 J-K Flip-Flop as D Flip-Flop** 10.7.2 D Latch 10.8 Synchronous and Asynchronous Inputs 10.9 Flip-Flop Timing Parameters
Twelfth	**12-Counters and Registers** 12.1 Ripple (Asynchronous) Counter 12.1.1 Propagation Delay in Ripple Counters 12.2 Synchronous Counter 12.3 Modulus of a Counter 12.4 Binary Ripple Counter – Operational Basics 12.4.1 Binary Ripple Counters with a Modulus of Less than 2N 12.4.2 Ripple Counters in IC Form
Thirteent	**13-Counters and Registers** Synchronous (or Parallel) Counters 13.6 UP/DOWN Counters 13.7 Decade and BCD Counters 13.8 Presettable Counters
Fourteent	**14-Data Conversion Circuits – D/A and A/D Converters**

	14.1 Digital-to-Analogue Converters 14.1.1 Simple Resistive Divider Network for D/A Conversion 14.1.2 Binary Ladder Network for D/A Conversion 14.2 D/A Converter Specifications 14.2.1 Resolution 14.2.2 Accuracy 14.2.3 Conversion Speed or Settling Time 14.2.4 Dynamic Range
Fifteenth	**15-Data Conversion Circuits – D/A and A/D Converters Types of D/A Converter** 15.3.1 Multiplying D/A Converters 15.3.2 Bipolar-Output D/A Converters 15.3.3 Compounding D/A Converters Types of A/D Converter

12. Course assessment	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.	
13. Learning and teaching References	
Main references	Digital Fundamentals by Floyd. Digital Design by M. Morris Mano.
support references	
Electronic references, websites	

1. Course:

English Language.

2. Assigned Password:

3. Semester / Year:

FIRST (2024-2025)

4. Date of preparation of this description:

29/3/2025

5. Available Forms of Attendance:

6. Number of credit hours (total) / number of units (total):

hours / 2units

7. Course administrator name

Name: Assist Lect. Safa mahmood
Email:

8. Course Objectives

1. The students learns how to communicate with forging people. 2. The students learns the grammar of the English language. 3. The student learns a wide range of vocabulary. 4. The student learns the right pronunciation of the words.	Course Objectiv

9.Teaching and Learning Strategies

This course depends on the theoretical presentation of the material.	Strategy

10.Course Structure:

Evaluation method	method education	Unit / Subject Name	Learning Out-comes Required	H.	The week
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit one: Hello!, and unite two: Your world	The student being able to practice what they have learned	2	The first
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit one: Hello!, and unite two: Your world	The student being able to practice what they have learned	2	Sec-ond
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	paragraphs for students on the topics of electricity, its im-portance, and connecting electrical circuits . " An Intro-duction to Electric Current. "	The student being able to practice what they have learned	2	Third
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	paragraphs for students on the topics of electricity, its im-portance, and connecting electrical circuits Electricity is the greatest invention "	The student being able to practice what they have learned	2	Four th

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Learning how to listen and how to translate paragraphs when listening to them "	The student being able to practice what they have learned	2	Fifth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit three: Personal information	The student being able to practice what they have learned	2	Sixth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit four: Family and friends	The student being able to practice what they have learned	2	Seventh
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit four: Family and friends	The student being able to practice what they have learned	2	Eighth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit four: Family and friends	The student being able to practice what they have learned	2	Ninth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit five: it is my life! , and Unit six: Every day	The student being able to practice what they have learned	2	Tenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit five: it is my life! , and Unit six: Every day	The student being able to practice what they have learned	2	Eleventh
Daily and monthly exams.	Theoretical lectures .	A review lecture	The student being able to practice what they have learned	2	Twelfth

Homework (at the end of the lecture).					
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	A review lecture	The student being able to practice what they have learned	2	Thir-teenth

Daily and monthly exams. Homework (at the end of the lec-ture).	Theoreti-cal lec-tures .	Unit nine: Happy birth-day	The student being able to practice what they have learned	2	Fo ur-tee nth
Daily and monthly exams. Homework (at the end of the lec-ture).	Theoreti-cal lec-tures .	Unit nine: Happy birth-day	The student being able to practice what they have learned	2	Fif-tee nth
Daily and monthly exams. Homework (at the end of the lec-ture).	Theoreti-cal lec-tures .	Unite ten: we have a good time!	The student being able to practice what they have learned	2	Six tee nth
Daily and monthly exams. Homework (at the end of the lec-ture).	Theoreti-cal lec-tures .	Unite ten: we have a good time!	The student being able to practice what they have learned	2	Sev en-tee nth

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit seven: places I like	The student being able to practice what they have learned	2	Eighteenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit seven: places I like	The student being able to practice what they have learned	2	Nineteenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unite eight: where I live	The student being able to practice what they have learned	2	twenti-eth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unite eight: where I live	The student being able to practice what they have learned	2	Twenty-first
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	A review lecture	The student being able to practice what they have learned	2	Twenty-second
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	A review lecture	The student being able to practice what they have learned	2	Twenty-third

Daily and monthly exams. Homework (at the end of the lecture).	Theoreti-cal lec-tures .	Unit eleven: we can do it!	The student being able to practice what they have learned	2	Fo urt h Tw ent y
Daily and monthly exams. Homework (at the end of the lecture).	Theoreti-cal lec-tures .	Unit eleven: we can do it!	The student being able to practice what they have learned	2	twe nty - fift h
Daily and monthly exams. Homework (at the end of the lecture).	Theoreti-cal lec-tures .	Unit twelve: Thank you very much!	The student being able to practice what they have learned	2	Tw ent y- sixt h
Daily and monthly exams. Homework (at the end of the lecture).	Theoreti-cal lec-tures .	Unit twelve: Thank you very much!	The student being able to practice what they have learned	2	Tw ent y- sev ent h
Daily and monthly exams. Homework (at the end of the lecture).	Theoreti-cal lec-tures .	Unit Thirteen: Here and now!	The student being able to practice what they have learned	2	Tw ent y- eig hth n
Daily and monthly exams. Homework (at the end of the lecture).	Theoreti-cal lec-tures .	Unit Thirteen: Here and now!	The student being able to practice what they have learned	2	Tw ent y- nin th

Daily and monthly exams. Homework (at the end of the lecture).	Theoreti-cal lec-tures .	Unite Fourteen: it's time to go!	The student being able to practice what they have learned	2	Thi rty

11-Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student such as daily preparati and, oral, monthly, and written exams and reports .... Etc. The pursuit score should be 50 and the fina exam should be 50%

12 -Learning and Teaching Resources

New Headway English Course	Required textbooks
New Headway English course (beginner)	Main references (sources)
The Headway series for learning English language	Recommended supporting boo and references. (Scientific journals, reports...
Provided on need	Electronic References, Websit

1. Course Name:
Electrical machines
2. Course Code:
3. Semester / Year:
The second stage / annual system System
4. Description Preparation Date:
29/03/2025
5. Available Attendance Forms:
My presence
6. Number of Credit Hours (Total) / Number of Units (Total)
5 hours / 10 units
7. Course administrator's name (mention all, if more than one name)
Name: Amani Yahya Kahdom Email: amani.almulla.inj@atu.edu.iq

8. Course Objectives	
Course Objective	1- Providing students with practical skills in using scientific terminology. 2- Obtaining scientific knowledge and facts related to machines and applying it to scientific life 3- Providing students with knowledge, scientific facts, information and their sources through scientific research.

9. Teaching and Learning Strategies	
Strategy	- Obtaining scientific knowledge and facts about types of electrical machines 2- Preparing a vocabulary of special scientific terminology for students of the Electrical Technology Department

	3- Obtaining expanded scientific facts and concepts in general and daily tests in particular.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
First	**5**	Magnetic circuits	Basic principles	lecture	Oral exam
Second	**5**	Types of direct current machines	Efficiency of DC machines	lecture	Questions and discussion
Third	**5**	Types of missing persons	Power distribution stages	lecture	Written test
Fourth	**5**	Factors affecting driving force	Calculating the driving force for all types of generators	lecture	homework
Fifth	**5**	Non-load curve	Calculate resistance and critical speed	lecture	Questions and discussion
Sixth	**5**	Study of load characteristics	Draw special curves	lecture	Oral exam
Seventh	**5**	Engine operation theory	Comparison of DC motors and generators	lecture	Written test
Eighth	**5**	Determination of the product	DC power distribution	lecture	Oral exam

Ninth	**5**	General characteristics of speed and torque of motors	Comparison of DC motors in uses	lecture	Questions and discussion
Tenth	**5**	Control the speed of machines	Control methods	lecture	Written test
Eleventh	**5**	Engine tests	Mathematical examples	lecture	homework
Twelfth	**5**	Electrical transformers	Draw trends	lecture	Oral exam
Thirteenth	**5**	Transformer tests	Description of efficiency calculation	lecture	Questions and discussion
Fourteenth	**5**	Autotransformer	Practical uses	lecture	Written test
Fifteenth	**5**	Three-phase transformers	Issues	lecture	homework
Sixteenth	**5**	Three-phase induction motors	Pros and Cons	**lecture**	Oral exam
Seventeeth	**5**	Comparison of induction motors	Installation and use of each type	**lecture**	Questions and discussion

Eighteent	**5**	Methods of controlling induction motors	Direct operation using an autotransformer	**lectur**	Written test
Nineteent	**5**	The relationship between torque and power factor	Maximum torque requirement	**lectur**	homework
Twenty	**5**	Reverse the direction of rotation of induction motors	Stop and control	**lectur**	Oral exam
Twenty-or	**5**	Single phase induction motors	General motor	**lectur**	Questions and discussion
Twenty-tw	**5**	Synchronous generators	Working principle	**lectur**	Written test
Twenty-thr	**5**	Comparison between direct current generators and alternating current generators	Miscellaneous issues	**lectur**	homework
Twenty-fou	**5**	Synchronous motors	Working principle	**lectur**	Oral exam

Twenty-fiv	**5**	Practical uses	Action theory	**lectur**	Questions and discussion
Twenty-si	**5**	Repulsive motor	Its working principle and use	**lectur**	Written test
Twenty-sev	**5**	Control motors	The theory of its operation	**lectur**	homework
Twenty-eig	**5**	Stepper motors	The theory of its operation and step calculation	**lectur**	Written test
Twenty-ni	**5**	Tachometer generators	Their types and distinction between them	**lectur**	Questions and discussion
Thirty	**5**	Linear actuators	Problems that appear with engines	**lectur**	Oral exam

11-Course Evaluation

Course: (25 mid-term exams + 25 second semester exams + 40 final exams + 10 activities with the practical exam)Final grade: 100 marks

12-Learning and Teaching Resources

1- - Methodical books
2- Summaries of the curriculum.
3- Sources from the Internet as an addition to the curriculum.

1. Course Name:
Electric Networks
2. Course Code:
–
3. Semester / Year:
second year
4. Description Preparation Date:
29/3/2025
5. Available Attendance Forms:
Theoretical lecture, practical training
6. Number of Credit Hours (Total) / Number of Units (Total):
120 hours (60 theoretical + 60 practical)/8 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Abdullah Sahib Abdulsada Email: abdward780@atu.edu.iq

8.Course Objectives	
Course Objectives	● Description of the electrical power system (voltage levels- National Network Components) ● Components and role (generating stations - transformer stations - distribution stations) ● Electrical power transmission lines (types of towers + types of conductors) ● Insulators of overhead transmission lines, types, shapes, installation. ● Ground cables – their components – their division – laying cables

9.Teaching and Learning Strategies	
Strategy	• Scientific lectures - practical lectures - scientific trips - daily, monthly and quarterly tests and scientific reports.

10. Course Structure					
Week	**Hours**	**Required Learning Out–comes**	**Unit or subject name**	**Learning method**	**Evaluation method**
the first	**4**	Understanding the subject of the unit	Definition of the electrical power system (voltage levels - components of the national grid)	Theoretical lectures practical training	Daily Monthly annual
the second	**4**	Understanding the subject of the unit	Electric power plants (types + installation of stations and their components)	=	=
the third	**4**	Understanding the subject of the unit	Electric power plants (types + installation of stations and their components)	=	=
the fourth	**4**	Understanding the subject of the unit	Electrical power conversion stations (types + installation of stations and their components)	=	=
Fifth	**4**	Understanding the subject of the unit	Electrical power conversion stations (types + installation of stations and their components)	=	=
Sixth	**4**	Understanding the subject of the unit	Electrical power transmission lines (types of towers + types of conductors)	=	=
Seventh	**4**	Understanding the subject of the unit	Overhead lines - mechan calculations: - Calculation of tension a loosening when the dime sions from the ground su face are equal - Calculate the weight of snow accumulated on th wire. calculate the magnitude of the wind pressure force acting on the wire,	=	=
VIII	**4**	Understanding the subject of the unit	Calculations of the basic elements of overhead transmission lines - electrical calculations: - Calculation of resistance - Calculation of the internal and external inductance of the single wire	=	=
Ninth	**4**	Understanding the subject of the unit	- Calculation of the inductance of the triple system consisting of three	=	=

			wires separated from each other by equal distances, or different distances or exchanged on site		
The tenth	**4**	Understanding the subject of the unit	Solving short lines includes representing them as an electrical circuit calculating their efficiency Solving intermediate lines and dividing them into representing them as an electrical circuit in the shape of the letter T represent it as an electrical circuit in the shape of the letter π	=	=
Eleventh	**4**	Understanding the subject of the unit	Solving short lines includes representing them as an electrical circuit calculating their efficiency Solving intermediate lines and dividing them into representing them as an electrical circuit in the shape of the letter T represent it as an electrical circuit in the shape of the letter π	=	=
Twelfth	**4**	Understanding the subject of the unit	Overhead transmission line insulators, types, shapes, composition, discharge phenomenon, causes and methods used to dispose of them	=	=
Thirteenth	**4**	Understanding the subject of the unit	Solve miscellaneous problems with line transaction calculations	=	=
Fourteenth	**4**	Understanding the subject of the unit	Solve miscellaneous problems with line transaction calculations	=	=
Fifteenth	**4**	Understanding the subject of the unit	Ground cables – their components – division Laying cables	=	=
Sixteen	**4**	Understanding the subject of the unit	Calculation of insulation resistance, amplitude and inductance of single- and three-core ground cables	=	=
Seventeenth	**4**	Understanding the subject of the unit	Ultra Voltage Cables – Components – Types	=	=
Eighteen	**4**	Understanding the subject of the unit	Distribution networks and DC distributors that are fed from one end – and from both ends	=	=

Nineteenth	**4**	Understanding the subject of the unit	Ring dispensers of all types – comparison between different types of dispensers	=	=
The twenti-eth	**4**	Understanding the subject of the unit	Solving various problems about the eighteenth and nineteenth week	=	=
21st	**4**	Understanding the subject of the unit	Faults in electrical networks	=	=
twenty tow	**4**	Understanding the subject of the unit	Protection relays and circuit breaker	=	=
twenty third	**4**	Understanding the subject of the unit	Inductive follow-ups against surge current, against power reversal, electronic follow-ups	=	=
twenty fourth	**4**	Understanding the subject of the unit	Protection of the electrical power system Overhead transmission line protection Bus-Bar protection	=	=
twenty fifth	**4**	Understanding the subject of the unit	Solving various questions on the protection of the electrical power system	=	=
twenty-sixth	**4**	Understanding the subject of the unit	Solving various questions on the protection of the electrical power system	=	=
twenty sev-enth	**4**	Understanding the subject of the unit	How to protect synchronous generators using: (Differential Protection) (Digital Protection) (Reverse Power Protection))	=	=
Twenty-eighth	**4**	Understanding the subject of the unit	How to protect synchronous generators using: (Differential Protection) (Digital Protection) (Reverse Power Protection))	=	=
Twenty-ninth	**4**	Smart electrical grids		=	=
Thirty	**4**	Understanding the subject of the unit	Solve various synchronous generator protection questions	=	=

13. Course Evaluation
The first semester (10 theoretical + 10 practical + 5 assessment) 25%, **the second semester** (10 theoretical + 10 practical + 5 assessment) 25%, **annual endeavor** 50%, **final theoretical** 40%, **final practical** 10%, **total** 100%

14. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Related books from the Internet
Main references (sources)	1- Electrical Power Engineering, Dr. Aser Ali Zaki 2- Electrical Power Engineering, Prof. Dr. Mahmoud Gilani. 3- **Course In Electrical Power by, M.L.SONI.**
Recommended books and references (scientific journals, reports...)	2- All relevant books approved by other institutes and universities with the same specialty 2-Books from the Internet
Electrical Networks References, Websites	All websites that contain the above books

1. Course Name:
Power electronic
2. Course Code:
–
3. Semester / Year:
second year
4. Description Preparation Date:
29/3/2025
5. Available Attendance Forms:
Theoretical lecture, practical training
6. Number of Credit Hours (Total) / Number of Units (Total):
150 hours (60 theoretical + 90 practical)
7. Course administrator's name (mention all, if more than one name)
Name: م.م صادق عبد الله شعبان Email: sadeqabdullah91@gmail.com

8. Course Objectives	
Course Objectives	• **Identify the types of semiconductors devices** • **Introducing the student to the various power electronic circuits**

9. Teaching and Learning Strategies	
Strategy	• The student will be able to understand the main types of electronic devces • The student will be able to understand, inspect and maintain the electronic boards • The student will be able to analyze the doing the mathematical calculation of electronic circuits

10.Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
the first	**5**	The student will want to learn about the types of diodes and the principle and electronic circuits in which the diode is included	Power electronic ,electronic componts which used in high power control(power diodes, thyristor and power transistors)pevison of single phase rectifier circuites by using diodes.	Theoretical lectures practical training	daily Monthly annual
the second	**5**	Tools for students to identify three-phase rectifiers	Three phase rectifier circuites by using diodes, output voltage waveform, diode current waveform, output voltage equation in case of resistance lode.	Theoretical lectures practical training	daily Monthly Annual
the third	**5**	The student will want to know the types of transistors and their principles	Using the transistor as switch, regions of operation, transistor as a switch(cut off and saturation)	Theoretical lectures practical training	daily Monthly Annual
the fourth	**5**	The student will be asked to learn how to turn a transistor on and off	Power transistor in (off)and (on)state, improvement of(off)and(on)time by using speed up capacitance, practical problems.	Theoretical lectures practical training	daily Monthly annual
Fifth	**5**	The student will learn how to install a transistor	Uniplolor junction transistor , construction , theoretical operation , using the transistor as relaxation oscillator practical example	Theoretical lectures practical training	daily Monthly Annual
VI	**5**	The student will be able to identify and use electrical amplifiers	operatioal amplifier , discription of operational amplifier (op-amp) as asparate components , zero detector , comparator	Theoretical lectures practical training	daily Monthly Annual
Seventh	**5**	The student will want to become familiar with the circuit that powers the expander	The use of op-amp as astable multivibrator and a monostable multivibrator , photo conduction cells , photo diodes	Theoretical lectures practical training	daily Monthly Annual
VIII	**5**	The student will already know the types of light-emitting diodes	Light – emitting diodes (LED), photo transistors , the use of optical comparator in power Electronic circuits	Theoretical lectures practical training	daily Monthly Annual
		Declare the types of photo diode and photo transistor and explain the concept of its working			

		Declare the the types of pv connections and calculations			
		Declare the types of pv system batteries and doing a calculations of charging and discharging time			
Ninth	**5**	The student will be able to identify the types of thyristors and their operation	Thyristor , construction , characteristic , curves for a thyristor , thyristor conduction in forward biasing , thyristor family , thyristor representation as a double transistor circuit.	Theoretical lectures practical training	daily Monthly Annual
The tenth	**5**	The student can learn how many power the thyristor is included in	power.Thyristor conduction methods , conduction through the gate minimum gate current causing conduction , conduction time , conduction due to high forward voltage rectifire (dv/dt)	Theoretical lectures practical training	daily Monthly Annual
eleventh	**5**	The student will be able to identify the characteristics of these types of thyristors and their operation	DIAC , TRIAC characteristics , practical applications , thyristor ,triggering methods , triggering on DC and AC current , pluse triggering types	Theoretical lectures practical training	daily Monthly Annual
Twelveth	**5**	The student will learn to recognize how a thyristor is fired	thyristor triggering circuit , DC and AC triggering circuits	Theoretical lectures practical training	daily Monthly Annual
Thirteenth	**5**	The student will be expected to recognize the pulse and its action	Pluse current triggering circuit , relaxation oscillator ,zero detector , comparator with astable and monostable multivibrators(operational amplifiers and timer)	Theoretical lectures practical training	daily Monthly Annual
Fourteenth	**5**	The student will be able to identify the electronic circuit in which the thyristor is included	Thyristor general application introductory , AC to DC inverter DC to AC inverter , DC to DC inverter , AC to AC inverter , phase controlled Half wave rectifire with resistance and inductance load output current and voltage waveform , output voltage equations	Theoretical lectures practical training	daily Monthly Annual
Fifteenth	**5**	The student will be able to identify the types of	Half controler full wave rectifire fully controlled ,resistance and	Theoretical lectures practical	daily Monthly

		fuels in the rectifier circuit using thyristors and their operation	inductance load , generated wave forms , ou put voltage equation for free wheeling diode.	training	Annual
Sixteen	**5**	The student will learn to recognize the ability, its circuits and its operation	Regenrating fully controlled inverters , examples , DC motor speed control	Theoretical le tures practical training	daily Monthly Annual
Seventeenth	**5**	The student will learn to recognize the shape of the Kharj world and how to draw it	Three face inverters , out put voltage wave form with ,triggering pulses and equations	Theoretical le tures practical training	daily Monthly Annual
eighteen	**5**	The student can learn about thyristor protection methods	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	Theoretical le tures practical training	daily Monthly Annual
Nineteenth	**5**	The student will be able to learn about the inverter circuit and its operation	DC to AC inverters methods of forcing the thyristor to get off	Theoretical le tures practical training	daily Monthly Annual
The twentieth	**5**	The student will learn to recognize single- and three-phase inverters and their operation	Parallel and series inverter , single and three phase , control methods in charging frequency and voltage , output wave forms1	Theoretical le tures practical training	daily Monthly Annual
21st	**5**	The student was asked to learn how to control the speed of an engine using an inverter	Inverter application , emergency power supply , single phase DC motor speed control	Theoretical le tures practical training	daily Monthly Annual
twenty tow	**5**	The student will learn how to control tripods using electronics	Three phase motor control by using a constant ratio of variation frequency and voltage	Theoretical le tures practical training	daily Monthly Annual
twenty third	**5**	The student will be able to identify the working principle of a direct current transformer	Choppers , DC to DC inverter frequency constant , line constant	Theoretical le tures practical training	daily Monthly Annual
twenty fourth	**5**	The student will be able to learn about many types of work	Types of choppers , DC motor speed control	Theoretical le tures practical training	daily Monthly Annual

25th	**5**	The student will learn to recognize effective organizations	AC to AC inverter , single phase voltage regulator , three phase voltage regulator	Theoretical lectures practical training	daily Monthly Annual
twenty-sixth	**5**	The student will learn how to quickly recognize how to control	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	Theoretical lectures practical training	daily Monthly annual
27th	**5**	The student will learn to identify and operate inverters and direct current transformers	Cyclic inverter , AC to DC cyclic inverter , DC to DC cyclic inverter	Theoretical lectures practical training	daily Monthly Annual
Twenty-eighth	**5**	The student will be able to identify AC transformers and their operation	AC to AC cyclic inverter control block diagram	Theoretical lectures practical training	daily Monthly Annual
XXIX	**5**	The student will be asked to learn how to control speed using the vastus	Using amplitude modulation for speed control	Theoretical lectures practical training	daily Monthly Annual
Thirty	**5**	It will be widely released	The required durability, appearance and general appearance of the foundation -	Theoretical lectures practical training	daily Monthly annual

15. Course Evaluation	
The first semester (10 theoretical + 10 practical + 5 assessment) 25%, **the second semester** (10 theoretical + 10 practical + 5 assessment) 25%, **annual endeavor** 50%, **final theoretical** 40%, **final practical** 10%, **total** 100%	
16. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Related books from the Internet
Main references (sources)	Power electronics and drives AC–DC CONVERSION: CONTROLLED RECTIFICATIONS **By bogdan M. wilamowski**
Recommended books and references (scientific journals, reports…)	3- All relevant books approved by other institutes and universities with the same specialty 2-Books from the Internet
Electronic References, Websites	All websites that contain the above books

1. Course name: Workshop lab	
2. Course code: RELEC1002	
3. Semester / year: 2024 – 2025	
4. Date this description was prepared: 29/3/2025	
5. Available forms of attendance: Workshop lab	
6. Number of study hours (total) / Number of units (total): 6 hours /1 2 units	
7. Name of the course administrator	
Name: Azhar Kadhim Yousif	Email: azhar. yousif @atu.edu.iq
8. Course objectives	
Objectives of the study subject	The student will be able to: 1-Disassemble and assemble electrical machine parts 2-Inspect electrical machines after winding -3 Differentiate between electrical machines and make good choices
9. Teaching and learning strategies	
The strategy	Scientific lectures - daily, monthly and quarterly tests and scientific reports

10- Course structure					
Week	**Hours**	**Required learning outcomes**	**Name of the unit / topic**	**Teaching method**	**Evaluation method**
First	6	Understand the topic of the unit	Installation of DC machines - Methods of rewinding DC machines - Detailed drawing	Practical training	Direct evaluation & Written exams
Second	6	Understand the topic of the unit	How to clean the surface of units - Installing carbon brushes - Practical application of carbon brush.	Practical training	Direct evaluation & Written exams
Third	6	Understand the topic of the unit	Testing connectivity, disconnection, and isolation.	Practical training	Direct evaluation & Written exams
Fourth	6	Understand the topic of the unit	Production member files for DC generator - information preparation and assembly - winding the production member file and installing the files on the iron core slots - simplified examples of winding.	Practical training	Direct evaluation & Written exams
Fifth	6	Understand the topic of the unit	Isolation with varnish - drying - connecting the end terminals - final selection of the production member - complete drawing of the production member with all its files, connections, and uses.	Practical training	Direct evaluation & Written exams
Sixth	6	Understand the topic of the unit	Field files - gathering information for parallel and series files - forming conductors with a large cross-section - properties of parallel and series field files and methods of connecting them in the machine. Winding on the mold	Practical training	Direct evaluation & Written exams
Seventh	6	Understand the topic of the unit	File work and installation of single-pole - full machine test - electric transformer - preparation and cutting of iron	Practical training	Direct evaluation & Written exams

			core sheets and assembly of coils, insulation with varnish, and training on working on a simple form before winding.		
Eighth	6	Understand the topic of the unit	File work and installation of single-pole - full machine test - electric transformer - preparation and cutting of iron core sheets and assembly of coils, insulation with varnish, and training on working on a simple form before winding	Practical training	Direct evaluation & Written exams
Ninth	6	Understand the topic of the unit	Connecting and linking the terminals - polarity test - continuity test - winding and insulation test in the files. Examples of designing and rewinding a small power transformer.	Practical training	Direct evaluation & Written exams
Tenth	6	Understand the topic of the unit	Study of three-phase transformers - simple design and detailed drawing	Practical training	Direct evaluation & Written exams
Eleventh	6	Understand the topic of the unit	Preparing and cutting iron heart sheets and assembling them - winding coils - fixing and insulating with varnish – drying	Practical training	Direct evaluation & Written exams
Twelfth	6	Understand the topic of the unit	Polarity test - Continuity test - Earth leakage test - Short circuit test - Insulation test	Practical training	Direct evaluation & Written exams
Thirteenth	6	Understand the topic of the unit	The inductive motors (induction) rewind the stator coils of a three-phase squirrel-cage induction motor - calculate and draw the general shape of the coils and remove the insulating materials and clean the slots - isolate the stator slots - wind the coils and shape them then install them on the slots.	Practical training	Direct evaluation & Written exams

Four-teenth	6	Understand the topic of the unit	Wrap and connect the ends of the files and test the continu-ity	Practical training	Direct evalua-tion & Written exams
Fif-teenth	6	Understand the topic of the unit	Contract selection in files - Isolation selection and meas-urement - Selection of ground leakage for the engine	Practical training	Direct evalua-tion & Written exams
Six-teenth	6	Understand the topic of the unit	Assembly of the motor and testing the motor at the speci-fied load for W - Study of the starting phase of three-phase motors - Direct method - Self-starting motor method	Practical training	Direct evalua-tion & Written exams
Seven-teenth	6	Understand the topic of the unit	Assembling the engine and testing the engine at the spec-ified load - Study of the three-phase motor starting phase - Direct method - Self-starting motor method	Practical training	Direct evalua-tion & Written exams
Eight-eenth	6	Understand the topic of the unit	Induction motor protection devices and the use of timers.	Practical training	Direct evalua-tion & Written exams
Nine-teenth	6	Understand the topic of the unit	Changing the connection of the final drive motor from star to delta, the motor origi-nally operates in Y - Δ and noting the differences in cur-rent and torque in both cases.	Practical training	Direct evalua-tion & Written exams
Twenti-eth	6	Understand the topic of the unit	The single-phase induction motor, a practical study of different types of single-phase induction motors - mo-tor installation - capacitor motor - split-phase motor.	Practical training	Direct evalua-tion & Written exams
Twenty-first	6	Understand the topic of the unit	The single-phase induction motor, a practical study of different types of single-phase induction motors - mo-tor installation - capacitor motor - split-phase motor.	Practical training	Direct evalua-tion & Written exams

Twenty-second	6	Understand the topic of the unit	Drawing files for a split-phase motor - multiple examples	Practical training	Direct evaluation & Written exams
Twenty-third	6	Understand the topic of the unit	Wrap the shaded pole motor with different types.	Practical training	Direct evaluation & Written exams
Twenty-fourth	6	Understand the topic of the unit	Continuity test - Polarization test - Ground continuity test - Short circuit test	Practical training	Direct evaluation & Written exams
Twenty-fifth	6	Understand the topic of the unit	Electrical and mechanical faults and ways to treat them	Practical training	Direct evaluation & Written exams
Twenty-sixth	6	Understand the topic of the unit	Wind the engine with the capacitor, perform the necessary tests on it - polar continuity test - ground fault - short circuit between coils.	Practical training	Direct evaluation & Written exams
Twenty-seventh	6	Understand the topic of the unit	Wind the ceiling and table fan motor and perform necessary tests.	Practical training	Direct evaluation & Written exams
Twenty-eighth	6	Understand the topic of the unit	Maintenance of household appliances - household refrigerator - mechanical and electrical malfunctions and their treatment methods	Practical training	Direct evaluation & Written exams
Twenty-ninth	6	Understand the topic of the unit	Maintenance of household appliances - home freezer - home air conditioner - mechanical and electrical faults and their remedies - periodic maintenance	Practical training	Direct evaluation & Written exams
Thirti-eth	6	Understand the topic of the unit	Maintenance of household appliances - electric washing machine - electrical malfunctions and how to treat them - periodic maintenance	Practical training	Direct evaluation & Written exams

12- **Course Development Plan:**

1- Participation in the various courses of the subject to give the workshop trainers more experience.

2- Access to the latest modern technology in the field of maintenance and repair of electrical appliances.

3- Preparing courses that develop the ability of trainers in workshops so that they
can train students more efficiently.

4- Providing workshops with modern devices and equipment that keep pace with scientific development in developed countries.

1. Course Name:
Electrical installation and wiring
2. Course Code:
3. Semester / Year:
2024−2025
4. Description Preparation Date:
2025
5. Available Attendance Forms:
In hall and lab attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
120/8 credits
7.Course administrator's name (mention all, if more than one name)
Name: Dr. Hasan Wahhab Salih Email: Hassan.wahhab.inj@atu.edu.iq

8.Course Objectives	
Course Objective	1. Introducing the student to electrical installation systems and regulations. 2. The student should be capable of practicing electrical work in stations and buildings safely and professionally. 3. Understanding the latest technologies related to electrical distribution statio control systems, grounding, and protection. 4. Familiarizing with classic self-control systems used in most distribution boards. 5. Identifying the types of ground clamps and their installation and expansio methods. 6. Understanding the operation of modern lighting and elevator systems.

9.Teaching and Learning Strategies	
Strategy	Scientific lectures - Practical sessions - Scientific trips - Daily, monthly, and quarterly exams - Scientific reports.

10. Course Structure

Week	Hours	Required Learning Outcomes	Learning method	Evaluation method
First	4	Cables - Cable Components and Operating Voltage, Types of Cables According to Insulation Type M.I.M.P.V.C.T.R.S.V.R.I and Lead-Sheathed Paper Cables.	Lecture	Oral, written, and practical tests.
Second	4	Extending Cable Methods, Possible Cable Faults, and Methods for Fault Identification.	Lecture	Oral, written, and practical tests
Third	4	Protection of Electric Motors, Protection Against Overcurrents Resulting from Short-Circuit Currents.	Lecture	Oral, written, and practical tests
Fourth	4	Protection Against Overcurrents Due to Overload	Lecture	Oral, written, and practical tests
Fifth	4	Protection against Phase Loss (phase failer)or Phase Dropout and Protection against Voltage Sag or Voltage Drop	Lecture	Oral, written, and practical tests
Sixth	4	Circuit Breakers, Their Types (Oil Circuit Breakers, SF6 Circuit Breakers, Vacuum Circuit Breakers, Air Pressure Circuit Breakers).	Lecture	Oral, written, and practical tests
Seventh	4	Substations, Vertical Busbars, Air Pressure Switchgear Panel, Classification of Variable Current Control Panels.	Lecture	Oral, written, and practical tests
Eighth	4	Lighting, Principles of Illumination Engineering, Light Sources, 4Lighting Systems and Their ypes, Light Measurement Devices.	lecture	Oral, written, and practical tests
Ninth	4	Mathematical example on how to design and calculate electrical lighting for halls, workshops, and yards.	Lecture	Oral, written, and practical tests
Tenth	4	Basic elements in the electrical control circuit .	Lecture	Oral, written, and practical tests
Eleventh	4	Voltage Drop in Single-Phase Feeders, Meaning of Voltage Drop, Causes of Voltage Drop, Damages	Lecture	Oral, written, and practical tests

		Resulting from Voltage Drop, Testing of Feeders (Cables), Factors Affecting Current Ratings.		
Twelfth	4	Mathematical example on voltage drop calculations	Lecture	Oral, written, and practical tests
Thirteenth	4	Auto control and components of control and power circuits.	Lecture	Oral, written, and practical tests
Fourteenth	4	Establishment of Hazardous Areas (Examples of Hazardous Areas), Characteristics of Installation in Hazardous Areas, and Steps to be Taken for that.	Lecture	Oral, written, and practical tests
Fifteenth	4	Earthing system , Its Types, Installation of Grounding Conductors for Substations, Buildings, and Lightning Arresters.	Lecture	Oral, written, and practical tests
Sixteenth	4	Definition of electrical energy expenditures (tariffs): Fixed and variable costs, energy expenditure accounting systems, and tariff systems of various types.	Lecture	Oral, written, and practical tests
Seventeeth	4	Energy meters, three-phase energy meter, its internal components and the errors that occur in it, meter connection methods, power factor meter, its components, and working theory	Lecture	Oral, written, and practical tests
Eighteenth	4	Power factor, importance power factor correction , methods to power factor correction , solved examples on how to calculate power factor.	Lecture	Oral, written, and practical tests
Nineteenth	4	Components of electrical grids and studing the protections of that grid.	lecture	Oral, written, and practical tests
Twenty	4	Mathematical example on heating calculations.	lecture	Oral, written, and practical tests
Twenty-one	4	Electric elevators, selecting the elevator location and type, and the tests to be followed when choosing an elevator for a specific service (capacity, required specifications, speed), calculating transit time, elevator efficiency, and service type.	lecture	Oral, written, and practical tests
Twenty-two	4	Types of elevators: Passenger elevators, freight elevators. Services, main components of any elevator:	lecture	Oral, written, and practical tests

		guide rails or hoistway, motor, landing doors, car, load balancer, indicators, controllers, safety devices.		
Twenty-three	4	Design an elevator traction motor and reduction ratio.	lecture	Oral, written, and practical tests
Twenty-four	4	the stopping set: A signaling system linked to the elevator's ascent and descent.	lecture	Oral, written, and practical tests
Twenty-five	4	Types of motors used in elevators, specifications, speed regulation for alternating current (AC) and direct current (DC) motors.	lecture	Oral, written, and practical tests
Twenty-six	4	Safety precautions and frictional slip stoppage for elevator sliding. Lower and upper springs for the elevator. Lighting.	lecture	Oral, written, and practical tests
Twenty-seven	4	Lightning arresters, how lightning occurs and is discharged, specifications for proper implementation of lightning arresters, protecting buildings and structures from lightning.	lecture	Oral, written, and practical tests
Twenty-eight	4	Example on calculations of a lightning arrester circuit.	lecture	Oral, written, and practical tests
Twenty-nine	4	Methods of project implementation through tenders and their required conditions, analysis of tenders, and the principles upon which the tender relies.	lecture	Oral, written, and practical tests
Thirty	4	Types of estimation, methods of conducting estimation, and estimating the necessary materials for foundation work and the required amounts for it. Factors affecting the cost of engineering work.	lecture	Oral, written, and practical tests

11-Course Evaluation

Course: (25 mid-term exams + 25 second semester exams + 40 final exams + 10 activities with the practical exam)Final grade: 100 marks

12-Learning and Teaching Resources

1- كتاب التاسيسات الكهربائية (مظفر النعمة، -سنان رياشي)
2- كتاب اساسيات الكهرباء (أ.د. احمد رحيل)
-3

Electric3- al Principles and Practices

Zurlis, Peter A., Mazur, Glen A.

1. Course name: Computer's applications	
2. Course code:	
3. Semester / year: 2024 – 2025	
4. Date this description was prepared: 29/03/2025	
5. Available forms of attendance: attendance inside the lecture hall and laboratory	
6. Number of study hours (total) / Number of units (total): 90 hours / 6 units	
7. Name of the course administrator	
Name: Ass. Lec. Hussein Ali Mohammed Email: hussein.ali.inj@atu.edu.iq	
8. Course objectives	
Objectives of the study subject	**a) Teaching the student to use the Excel 2007 program as tables, perform calculations, and use it Functions and making charts. b) Teaching the student about the types of networks, using the Internet, and dealing with browsers and search engines And email. c) Teaching the student to use the PowerPoint program to create presentations from scratch or from a template and then Add text, pictures, drawings, and video clips, and then add transitions, animation, and movement Cinematic**
9. Teaching and learning strategies	
The strategy	**Scientific lectures - practical lectures - scientific trips - daily, monthly and quarterly tests And scientific reports.**

10- Course structure					
Week	**Hours**	**Required learning outcomes**	**Name of the unit / topic**	**Teaching method**	**Evaluation method**
First	3	Understand the topic of the unit	• Working with Excel 2007 and learning about ways to access the program. • Identify the components of the Excel 2007 screen and the concept of the active cell. • Identify the most important tapes in the program, including: a) Address bar. b) Menu bar. c) Toolbar. d) Equations bar. e) Status bar.	Theoretical lectures + practical application	Live assessment + written and practical exams
Second	3	Understand the topic of the unit	• Create an Excel workbook, save it, and close it. • Dealing with and moving between worksheet cells. • Work on editing and amending worksheets.	Theoretical lectures + practical application	Live assessment + written and practical exams
Third	3	Understand the topic of the unit	• Page layout in Excel: □ Page orientation. □ Footnotes. □ Paper. □ Header and footer of pages. □ Presentation methods. □ Control page breaks.	Theoretical lectures + practical application	Live assessment + written and practical exams
Fourth	3	Understand the topic of the unit	• Coordination orders: □ Alignment. □ Formatting numbers. □ Insert rows, columns, cells and sheets. □ Delete rows, columns, cells and sheets. □ Formatting rows, columns and cells. □ Organizing papers.	Theoretical lectures + practical application	Live assessment + written and practical exams
Fifth	3	Understand the topic of the unit	• Working on merging the cells together. • Conditional formatting of commands: □ Rules for distinguishing cells. □ Color standards. • Working on sorting and filtering cells. • Search and replace.	Theoretical lectures + practical application	Live assessment + written and practical exams
Sixth	3	Understand the topic of the unit	• Images and objects: 1) Inserting and modifying images. 2) Insert AutoShapes. 3) Insert a WordArt text style. • Insert a text box	Theoretical lectures + practical application	Live assessment + written and practical exams
Seventh	3	Understand the topic of the unit	• Insert a header and footer. • Incorporate page numbering. • Insert hyperlink. • Insert equations and symbols. • Insert SmartArt	Theoretical lectures + practical application	Live assessment + written and practical exams
Eighth	3	Understand the topic of the unit	• Hide and show rows, columns, and sheets. • Freeze rows and columns. • Arithmetic operations and their precedence	Theoretical lectures + practical application	Live assessment + written and practical exams

Ninth	3	Understand the topic of the unit	• Arithmetic operations and their precedence: Auto sum Sum Average Max Min count	Theoretical lectures + practical application	Live assessment + written and practical exams
Tenth	3	Understand the topic of the unit	• Arithmetic operations and their precedence: Count Count A Count blank Large Small Abs	Theoretical lectures + practical application	Live assessment + written and practical exams
Eleventh	3	Understand the topic of the unit	• Conditional function IF. • Reproducing function formulas. • Relative and absolute cells. • Custom sorting and sorting in Excel.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twelfth	3	Understand the topic of the unit	• Spelling and grammar checking. • Dictionary of synonyms. •The number of words . • Translation screen tip.	Theoretical lectures + practical application	Live assessment + written and practical exams
Thirteenth	3	Understand the topic of the unit	• Making charts (graphs). • Preview before printing. •printing .	Theoretical lectures + practical application	Live assessment + written and practical exams
Fourteenth	3	Understand the topic of the unit	• Networks and their types. • Network forms. • Network protocols.	Theoretical lectures + practical application	Live assessment + written and practical exams
Fifteenth	3	Understand the topic of the unit	• Connecting to the Internet. • Fire walls. • Some basic Internet concepts.	Theoretical lectures + practical application	Live assessment + written and practical exams
Sixteenth	3	Understand the topic of the unit	• Open the internet browser. • Internet browser window components. • Toolbars. • Browser icons.	Theoretical lectures + practical application	Live assessment + written and practical exams
Seventeenth	3	Understand the topic of the unit	• Web addresses. • Change the home page. • Close the browser and disconnect from the Internet. • Store favorite pages.	Theoretical lectures + practical application	Live assessment + written and practical exams
Eighteenth	3	Understand the topic of the unit	•search engines . • How to search for information on the network. • Copy texts and images from websites to any application.	Theoretical lectures + practical application	Live assessment + written and practical exams
Nineteenth	3	Understand the topic of the unit	• Download files from the Internet. • Preparing for printing. •printing .	Theoretical lectures + practical application	Live assessment + written and practical exams

Twentieth	3	Security and networking:		Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-first	3	ntroduction to internet and web browsers, LAN, WAN		Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-second	3	Introduction to internet and web browsers(cont.) concept of internet and its applications		Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-third	3	Understand the topic of the unit	• Prepare slide page margins. • Font format: 1) Enlarge and reduce the font. 2) Font size. 3) Changing the font type, font color, and everything related to modifying the font. • Bullet and number numbers. 4) Change the spacing between lines of text.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-fourth	3	Understand the topic of the unit	• Insert header and footer for slides. • Include the slide numbering process. • Insert hyperlink. • Insert equations and symbols. • Insert SmartArt.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-fifth	3	Understand the topic of the unit	• Work on designing the slides through the Design menu and choosing designs for the slides. • Change the direction of the slides.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-sixth	3	Understand the topic of the unit	• Work on adding transfers through the transfers list. • Add transitions and specify the time for them. • Add sound to each added transition.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-seventh	3	Understand the topic of the unit	• Work on a list of movements and add many movements: □ Login. □ Confirmation. □ End. □ Movement paths. • Add movements and specify the time for them. • Add sound to each added movement.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-eighth	3	Understand the topic of the unit	• Spelling and grammar checking. • Dictionary of synonyms. •The number of words . • Translation screen tip.	Theoretical lectures + practical application	Live assessment + written and practical exams
Twenty-ninth	3	Understand the topic of the unit	• Ways to display presentations. • Main views. • Show and hide the vertical and horizontal rulers. • Direction of views.	Theoretical lectures + practical application	Live assessment + written and practical exams

Thirtieth	3	Understand the topic of the unit	• Search and replace. • Preview before printing. •printing .	Theoretical lectures + practical application	Live assessment + written and practical exams

10. Course evaluation

- ✓ First semester (10 theoretical + 10 practical + 5 evaluation) 25%,
- ✓ Second semester (10 theoretical + 10 practical + 5 evaluation) 25%
- ✓ Annual pursuit 50% Final theoretical 50%
- ✓ Final practical 10%
- ✓ Total 100%

11. Learning and teaching resources

Required textbooks (methodology, if any)	
Main references (sources)	Calculator applications book written by Prof. Dr. Lama Naji, Har Farouk
Recommended supporting books and referenc (scientific journals, reports....	1- All relevant books approved by other institutes and universiti with the same specialty 2- Books from the Internet
Electronic references, Internet sites	Website of the Najaf Technical Institute YouTube channels for teachers

1. Course name:	
Electrical engineerin drawing	
2. Course Code	
3. Semester/year:	
First /2024-2025	
4. Date this description was prepared:	
29/03/2025	
5. Available attendance formats:	
In person	
6. Number of study hours (weekly)/number of units:	
3 hours/3 units	
7. Name of the course administrator (if more than one name is mentioned)	
Name: Asst. Lecture. Sadeq Abdullah Email: sadeq.shaaban@atu.edu.iq	
8. Course objectives	
Objectives of the study subject	General goal: Teach the student to draw and read various electrical maps Specific objective: The student will be able to: 1--Recognizes electrical symbols and reads plans and various electrical circuits. 2--Knows how to draw symbols and connections for electrical installations, networks, and machines
9. Teaching and learning strategies	
The strategy	Scientific lectures - practical lectures - daily, monthly and quarterly tests and scientific reports.

10. Course structure	
The week	**Required learning outcomes**
First	draw the electrical wiring diagram for a two-story building
Second	train students on inking and inking the painting
Third	زيهجتلا رداصم ةددعتم ةينكسلا جاربلأل تاططخم مسر
Fourth	an explanation of the electrical installations in various locations (laboratories - laboratories - public halls(Using exposed and buried cables and implementing a drawing board on it
Fifth	Draw the electrical connection panel for connecting the three-phase delta and star transformer
Sixth	Drawing the electrical connection panel for a three-phase transformer connected in the form of a Y using Mirza-Praise type relays.
Seventh	Draw the electrical connection panel to reverse the direction of rotation of a three-way induction motor
Eighth	Drawing the complete electrical connection panel to operate a three-phase electric motor using Mirza-Praise type relays
Ninth	Draw a picture of a charging device for a battery from a three-phase source
Tenth	Establishing the complete installation of the distribution panel for a three-phase electric current generator fed by poles Internal direct current flow from a small generator installed along the axis of the original generator. The drawing includes measuring and protective devices
Eleventh	Drawing the special electrical connection panel to conduct the compatibility process between a three-phase electric motor and the National Electricity Company. Measurement and prevention devices will be placed on the drawing.
Twelfth	Study and analysis of electrical maps, electrical mapping systems, method of tracing maps - symbols and numbering
Thirteenth	Using an computer to draw electrical plans
Fourteenth	
Fifteenth	

11. Course assessment	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc. 1st month: 20 Evaluation:5 2nd month: 20 Evaluation:5 Final test: 50 Final grade: 100	
12. Learning and teaching References	
Main references	Iraqi standard (electrical specifications
support references	
Electronic references, websites	Electronic references, Internet sites

1. Course name:	
PLC	
2. Course Code	
3. Semester/year:	
second/2024-2025	
4. Date this description was prepared:	
29/03/2025	
5. Available attendance formats:	
In person	
6. Number of study hours (weekly)/number of units:	
3 hours/3 units	
7. Name of the course administrator (if more than one name is mentioned)	
Name: Asst. Lecture. Sadeq Abdullah Email: sadeq.shaaban@atu.edu.iq	
8. Course objectives	
Objectives of the study subject	The student will be able to 1- understand the main control items and connect that items to the PL unit 2- understand the PLC unit 3- programing the PLC unit
9. Teaching and learning strategies	
The strategy	Scientific lectures - practical lectures - daily, monthly and quarterly tests and scientific reports.

10. Course structure

The week	Required learning outcomes
First	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
Second	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 .
Third	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
Fourth	Processors, the Power Supply, and Programming Devices 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
Fifth	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
Sixth	Configuring the PLC Memory—I/O Addressing 5-6 Summary of Memory, Scanning, and I/O Interaction 5-7 Memory Considerations.
Seventh	The Discrete Input/Output System28 7-1 Introduction to Discrete I/O Systems 7-2 I/O Rack Enclosures and Table Mapping 7-3 Remote I/O Systems . 7-4 PLC Instructions for Discrete Inputs 7-5 Types of Discrete Inputs .
Eighth	PLC Instructions for Discrete Outputs 8-1 Discrete Outputs 8-2 Discrete Bypass/Control Stations8- 3 Interpreting I/O Specifications 8-4 Summary of Discrete I/O
Ninth	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
Tenth	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
Eleventh	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
Twelfth	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
Thirteenth	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.
Fourteenth	PLC System Documentation 14-1 Introduction to Documentation 142 Steps for Documentation 14-3 PLC Documentation Systems 14-4 Conclusion .
Fifteenth	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
11. Course assessment	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc. 1st month: 10	

Practical test:10 Evaluation:5 2nd month: 10 Practical test:10 Evaluation:5 Final test: 50 Final grade: 100

12. Learning and teaching References	
Main references	Building Arduino PLCs: The essential techniques you need to develop Arduino-based PLC By **Pradeeka Seneviratne (auth.)**
support references	
Electronic references, websites	www.plccontrol system.com

1. Course:
English Language.
2. Assigned Password:
3. Semester / Year:
Second (2024-2025)
4. Date of preparation of this description:
29/3/2025
5. Available Forms of Attendance:
6. Number of credit hours (total) / number of units (total):
120 hours / 2units
7. Course administrator name
Name: Assist Lect. Safa Mahmood **Email:**
8. Course Objectives
5. The students learns how to communicate with forging people. 6. The students learns the grammar of the English language. 7. The student learns a wide range of vocabulary. 8. The student learns the right pronunciation of the words. **Course Objecti**
9.Teaching and Learning Strategies
This course depends on the theoretical presentation of the material. **Strateg**

.10Course Structure:					
Evaluation method	**method education**	**Unit / Subject Name**	**Learning Outcomes Required**	**H.**	**The week**
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit one: Getting to Know you	The student being able to practice what they have learned	2	The first
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit one: Getting to Know you	The student being able to practice what they have learned	2	Second
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit one: Getting to Know you	The student being able to practice what they have learned	2	Third

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit two: The way we live	The student being able to practice what they have learned	2	Fourth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit two: The way we live	The student being able to practice what they have learned	2	Fifth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit two: The way we live	The student being able to practice what they have learned	2	Sixth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit three: It all went wrong	The student being able to practice what they have learned	2	Seventh

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit three: It all went wrong	The student being able to practice what they have learned	2	Eighth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit three: It all went wrong	The student being able to practice what they have learned	2	Ninth

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit four: Let's go shopping, and Unit five: What do you want to do?	The student being able to practice what they have learned	2	Tenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit four: Let's go shopping, and Unit five: What do you want to do?	The student being able to practice what they have learned	2	Eleventh
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	A review lecture	The student being able to practice what they have learned	2	Twelfth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	A review lecture	The student being able to practice what they have learned	2	Thirteenth

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit six: Tell me! What's it like?	The student being able to practice what they have learned	2	Fourteenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit six: Tell me! What's it like?	The student being able to practice what they have learned	2	Fifteenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit seven: Famous couples	The student being able to practice what they have learned	2	Sixteenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit seven: Famous couples	The student being able to practice what they have learned	2	Seventeenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	A review lecture	The student being able to practice what they have learned	2	Eighteenth

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	A review lecture	The student being able to practice what they have learned	2	Nineteenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit eight: Do's and don'ts	The student being able to practice what they have learned	2	twentieth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit eight: Do's and don'ts	The student being able to practice what they have learned	2	Twenty-first
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit nine: Going places	The student being able to practice what they have learned	2	Twenty-second
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit nine: Going places	The student being able to practice what they have learned	2	Twenty-third

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit ten: Scared to death	The student being able to practice what they have learned	2	Fourth Twenty
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit ten: Scared to death	The student being able to practice what they have learned	2	twenty-fifth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit eleven: Things that changed the world	The student being able to practice what they have learned	2	Twenty-sixth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit eleven: Things that changed the world	The student being able to practice what they have learned	2	Twenty-seventh
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit twelve: Dreams and reality, Unit thirteen: Earning a living, and Unit fourteen: Love you and leave you	The student being able to practice what they have learned	2	Twenty-eighth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit twelve: Dreams and reality, Unit thirteen: Earning a living, and Unit fourteen: Love you and leave you	The student being able to practice what they have learned	2	Twenty-ninth
Daily and monthly exams.	Theoretical lectures.	A review lecture	The student being able to practice what they have learned	2	Thirty

1. Learning and Teaching Resources	
New Headway English Course	Required textbooks
New Headway English course (intermediate)	Main references (sources)
The Headway series for learning English language	Recommended supporting boo and references. (Scientific journals, reports...
Provided on need	Electronic References, Websit

Homework (at the end of the lec-ture).					

Course Description Form	
1- Course Name : Crimes of Baath Regime	
2- Course Code :	
3- Semester / Year : 1st year	
4- Description Preparation Date : 2024	
5- Available Attendance Forms : In Class Attendance	
6- Number of Credit Hours (Total) / Number of Units (Total) : 30 h / 2 units	
7- Course administrator's name (mention all, if more than one name) : Name : Dr. Ali Takleef Email :	
8- Course Objectives :	
Course Objectives :	The aim of studying the Baath regime crimes is that there is a missing research knowledge link in the Iraqi research field . It relates to more than three decades during which the Baath Party ruled Iraq and committed humanitarian crimes. It is a major political issue, as well as the

	importance of historical studies, especially in the field of archiving and analysis Documents related to Baath regime crimes.
9- Teaching and Learning Strategies	
Strategy :	- Scientific lectures - Practical Lab. Experiments - Scientific trips - Daily, quarterly and monthly tests - Scientific reports.

10- Course Structure :					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject Name**	**Learn-ing Method**	**Evalua-tion Method**
Week 1	**1**	Baath Party crimes according to the Iraqi Criminal Court Law in 2005 The concept of crimes and their categories		Lectures	**Daily Quizez and Oral Discussion**
Week 2		Definition of crime linguistically and idiomatically			
Week 3		Crime departments			
Week 4		Types of international crimes			
Week 5		Decisions issued by the Supreme Criminal Court			
Week 6		Discussion of crimes and decisions issued by the Supreme Court			
Week 7		Explaining the definition of crimes and their types			
Week 8		Psychological crimes			
Week 9		Mechanisms of psychological crimes			

Week 10		Psychological effects of crimes	
Week 11		Social crimes	
Week 12		Militarization of society	
Week 13		Learn about the crimes committed by the former regime	
Week 14		Writing a report showing the crimes committed by the Baathist regime from other sources	
Week 15		A brief summary of the student's opinion about teaching crimes	
Week 16		Violations of Iraqi laws	
Week 17		Pictures of human rights violations	
Week 18		Some decisions regarding political and military violations of the Baath regime	
Week 19		Exam	

Week 20		Prison and detention places of the Baath regime	
Week 21		Exam	
Week 22		Environmental crimes	
Week 23		Military and radioactive contamination and mine explosions	
Week 24		Destruction of cities and villages (scorched earth policy)	
Week 25		Drying the marshes	
Week 26		Razing palm groves, trees and crops	
Week 27		Collective compensation crimes	
Week 28		The events of the cemeteries of the genocide committed	
Week 29		Chronological classification of genocide graves in Iraq, period 1963 AD - 2003 AD	

Week 30		Chronological classification of genocide graves in Iraq, period 1963 AD - 2003 AD		

11- C**ourse Evaluation**
Distribution of the grade out of 100 according to the tasks assigned to the student, such as : - Daily preparation, daily oral Discussion and Contribution. - Monthly written exams, reports, etc. - The Accumulative grade through the year should be 50 degree - Final exam should be 50 degree.
12- Learning and Teaching Resources

Required Textbooks (Curricular books , any)	**(Baath Party crimes) , Textbook**
Main References (Sources)	
Recommended Books References	
Electronic References - Websites	

17. Course:
English Language.
18. Assigned Password:
19. Semester / Year:
Second (2024–2025)
20. Date of preparation of this description:
29/3/2025
21. Available Forms of Attendance:
22. Number of credit hours (total) / number of units (total):
120 hours / 2units
23. Course administrator name
Name: Assist Lect. Safa Mahmood **Email:**

1. Course Objectives	
9. The students learns how to communicate with forging people. 10. The students learns the grammar of the English language. 11. The student learns a wide range of vocabulary. 12. The student learns the right pronunciation of the words.	**Course Objectives**
9.Teaching and Learning Strategies	
This course depends on the theoretical presentation of the material.	**Strategy**

10. Course Structure:					
Evaluation method	**method education**	**Unit / Subject Name**	**Learning Out-comes Required**	**H.**	**The week**
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit one: Getting to Know you	The student be-ing able to practice what they have learned	2	The first
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit one: Getting to Know you	The student be-ing able to practice what they have learned	2	Sec-ond
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit one: Getting to Know you	The student be-ing able to practice what they have learned	2	Third
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit two: The way we live	The student be-ing able to practice what they have learned	2	Fourt h

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit two: The way we live	The student being able to practice what they have learned	2	Fifth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit two: The way we live	The student being able to practice what they have learned	2	Sixth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures.	Unit three: It all went wrong	The student being able to practice what they have learned	2	Seventh

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit three: It all went wrong	The student being able to practice what they have learned	2	Eigh th
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit three: It all went wrong	The student being able to practice what they have learned	2	Nint h
Daily and monthly exams. Homework (at the end	Theoretical lectures .	Unit four: Let’s go shopping, and Unit five: What do you want to do?	The student being able to practice what they have learned	2	Tent h

of the lecture).					
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit four: Let's go shopping, and Unit five: What do you want to do?	The student being able to practice what they have learned	2	Eleventh
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	A review lecture	The student being able to practice what they have learned	2	Twelfth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	A review lecture	The student being able to practice what they have learned	2	Thirteenth

Daily and monthly exams. Homework (at the end	Theoretical lectures .	Unit six: Tell me! What's it like?	The student being able to practice what they have learned	2	Fourteenth

of the lecture).					
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit six: Tell me! What's it like?	The student being able to practice what they have learned	2	Fifteenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit seven: Famous couples	The student being able to practice what they have learned	2	Sixteenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit seven: Famous couples	The student being able to practice what they have learned	2	Seventeenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	A review lecture	The student being able to practice what they have learned	2	Eighteenth

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	A review lecture	The student being able to practice what they have learned	2	Nineteenth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit eight: Do’s and don’ts	The student being able to practice what they have learned	2	twentieth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit eight: Do’s and don’ts	The student being able to practice what they have learned	2	Twenty -first
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit nine: Going places	The student being able to practice what they have learned	2	Twenty -second

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit nine: Going places	The student being able to practice what they have learned	2	Twenty -third
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit ten: Scared to death	The student being able to practice what they have learned	2	Fourth Twenty
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit ten: Scared to death	The student being able to practice what they have learned	2	twenty-fifth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit eleven: Things that changed the world	The student being able to practice what they have learned	2	Twenty -sixth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit eleven: Things that changed the world	The student being able to practice what they have learned	2	Twenty -seventh

Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit twelve: Dreams and reality, Unit thirteen: Earning a living, and Unit fourteen: Love you and leave you	The student being able to practice what they have learned	2	Twenty-eighth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	Unit twelve: Dreams and reality, Unit thirteen: Earning a living, and Unit fourteen: Love you and leave you	The student being able to practice what they have learned	2	Twenty-ninth
Daily and monthly exams. Homework (at the end of the lecture).	Theoretical lectures .	A review lecture	The student being able to practice what they have learned	2	Thirty

11. Course Evaluation

Distribution of the score out of 100 according to the tasks assigned to the student such as daily preparation and, oral, monthly, and written exams and reports .... Etc. The pursuit score should be 50 and the final exam should be 50%

12. Learning and Teaching Resources

New Headway English Course	Required textbooks
New Headway English course (intermediate)	Main references (sources)
The Headway series for learning English language	Recommended supporting books and references. (Scientific journals, reports
Provided on need	Electronic References, Websites

Course Description Form	
1- Course Name : Project	
2- Course Code :	
3- Semester / Year : 2nd	
4- Description Preparation Date : 2025	
5- Available Attendance Forms : In Class Attendance	
6- Number of Credit Hours (Total) / Number of Units (Total) : 60 h / 4 units	
7- Course administrator's name (mention all, if more than one name) : Name : Email :	
8- Course Objectives :	
Course Objectives :	**1-** The student learns to deal with his group of students in order to support group work**.** **2- The student learns to choose the research or project problem and set goals and find a solution to the research problem.** **3- The student learns to write the final project report in an organized manner in the research format.**

9- Teaching and Learning Strategies	
Strategy :	- Scientific lectures - Practical Lab. Experiments - Scientific trips - Daily, quarterly and monthly tests - Scientific reports.

10- Course Structure :					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject Name**	**Learn-ing Method**	**Evalua-tion Method**
Week 1 & 2 & 3	**2**	Distributing the projects to the students, meeting with the supervising professor, and beginning to review the library to obtain resources for the project assigned to the students		Lectures	**Daily Quizez and Oral Discussion**
Week 4 – 10	**2**	Collect information about the project, begin the theoretical study, and prepare the necessary designs to implement the project.			
Week 11 & 14	**2**	Begin implementing the planned designs in practice and conducting experiments			
Week 15 – 18	**2**	Tests to obtain practical results - testing and evaluation of the previous stage.			
Week 18 – 21	**2**	Transferring the laboratory-conducted experiments to the panels to obtain the practical designed model, conduct testing on the final model, and obtain the final results for discussion.			
Week 22 &	**2**	Discussing the practical results and their			

23		compatibility with the realistic results and finding the necessary explanations for the apparent cases.		
Week 24 - 28	**2**	Arrange the written parts of the report for each of the previous stages of writing the final report on the project as follows: project name: Project Professor: Student names: Conclusion: Chapter One: Introduction Chapter Two: The theoretical part Chapter Three: The practical part and results Chapter Four: Discussion of results, conclusions and proposals. references		
Week 29 -30	**2**	Delivering the practical model of the project with the final report for final testing and evaluation.		

11- Course Evaluation
Distribution of the grade out of 100 according to the tasks assigned to the student, such as : - Monthly oral Discussion. - The Accumulative grade through the year should be 30 degree - Final Presentation and defense be 70 degree.
12- Learning and Teaching Resources

Required Textbooks (Curricular books , any)	
Main References (Sources)	
Recommended Books References	
Electronic References - Websites	