Academic program description form

University Name: Al-Furat Al-Awsat Technical University

the college/Institute: Polytechnic College - Karbala

scientific department: Department of Electrical Techniques

Name of the academic or professional program: Electrical Techniques

Name of the final certificate: Diploma of Electrical Technique

School system : Annual

Date the description was prepared:-2025/12/29

File filling date :-2026/1/5

Signature: **Signature:**

Head of Department Name: **Scientific Associate Name:**

Assit. Prof. : Mahmood Hakim Enad **Assit .pro. Dr. Mohammed Fadhil Neamah**

The file is checked by :

Division of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Signature:

Assit. prof. Ali Neamah Hasan

Date:

Signature:

Approval of the Dean

Prof. Dr. Fadhil M, Dahir

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

Academic Program and Course Description Guide

Electrical Techniques Department

Introduction:

In 2025, the Department of Electrical Engineering Technologies was established at the Karbala Polytechnic College/Middle Euphrates Technical University to award diploma and bachelor's degrees in electrical engineering. The department follows the Bologna Process for the two-year or four-year bachelor's degree programs, with a comprehensive curriculum developed at the semester level. The technical diploma and engineering bachelor's degree programs are designed to ensure graduates possess both the theoretical foundations and practical applications of electrical technology. The department strives to attract highly qualified academic and administrative staff to ensure the continuous development of employees' skills in relation to the department's achievements and to encourage scientific research.

The department includes a range of practical laboratories, such as: Electrical Circuits Laboratory, Electronics Laboratory, Engineering and Electrical Drawing Laboratory, Digital Electronics Laboratory, Computer Applications Laboratory, Electrical Laboratories, Electrical Installations Laboratory/1, Power Electronics Laboratory, Electrical Networks Laboratory, Electrical Installations Laboratory/2, Programmable Logic Controller (PLC) Laboratory, Maintenance Workshop, and Electrical Machines Laboratory.

Concepts and Terminology:

1. Educational Institution	**Al-Furat Al-Awsat Technical University/ Technical Institute of Karbala**
2. Scientific Department / Center	**Electrical Techniques Department**
3. Name of the Academic or Professional Program	**Electrical Power**
4. Name of the Final Certificate	**Technical Diploma**
5. Study System Annual / Course-based / Other	**Annual**
6. Accreditation Program	**ABET**
7. Date of Description Preparation	**17/12/2025**

Course Description:

The course description provides a concise summary of the key features of the course and the expected learning outcomes that the student is expected to achieve, demonstrating whether the student has maximized the available learning opportunities. It is derived from the program description.

Program Vision:

The Department of Electrical Technology at the Technical Institute of Karbala aspires to create a technical educational system through its existing programs that meet the needs and requirements of the community and service establishments related to the specialization, contributing to the desired civil development.

Program Mission:

The department is committed to disseminating scientific and technical knowledge in the field of electrical sciences by graduating national cadres with a level of education capable of comprehending modern technologies and supporting scientific progress to keep pace with scientific developments and advancing the following:

1. Developing future plans to enhance the educational and training curricula and graduate technical cadres in the field of electricity.
2. Engaging with the community in the industrial sector and strengthening relationships with the private sector in the fields of energy, training, and technical qualification.
3. Utilizing computer and internet technologies in education and training.
4. Focusing on scientific research among academics in the department and industrial staff to solve electrical energy problems.

Program Objectives:

1. Graduating qualified technical personnel capable of executing various electrical work tasks and conducting maintenance in various power stations.
2. Accomplishing the highest number of applied scientific research projects in collaboration with relevant ministries and departments.
3. Ensuring continuous cooperation between the department and development sectors in engineering and consulting fields.

Curriculum Structure:

The curriculum includes all the courses/subjects encompassed by the academic program according to the adopted learning system (semester-based, annual, Bologna Process), whether they are required by the ministry, university, college, or scientific department, along with the number of academic units.

Course (Department, Number, Title)	Math Physical/ Natural Sciences	Engineering Topics	General Education General Studies	Course was Offered: Year and, Semester
First year				
Electrical circuits and measurements		8		Year
Electrical installations		8		Year
Electronic		8		Year
Workshops		12		Year
mathematics	4			Year
computer applications	2			Year
Engineering and electrical drawing	6			Year
Human rights and democracy			2	Year
Occupational safety			2	Semster
Digital electronics		4		Semster
English Language			2	Year

Course (Department, Number, Title)	Math Physical/ Natural Sciences	Engineering Topics	General Education General Studies	Course was Offered: Year and, Semester

Second year				
Electrical machines		**10**		Year
Power transmission networks		**8**		Year
Power electronics		**10**		Year
Maintenance Laboratory workshop		**8**		Year
Electrical installation		**8**		Year
computer applications	**2**			Year
Electrical drawing		**3**		Semester
Programmable logic control (PLC)		**3**		Semester
The project		**4**		Year
English language	**2**			Year
Crimes of the Baath Regime in Iraq			**2**	year

1- Program Vision:	
The department aims to graduate skilled technical personnel capable of performing electrical work.	

2-Program Mission:
The department is committed to disseminating scientific and technical knowledge in the field of electrical engineering to graduate national cadres with a level of education capable of understanding modern technologies and supporting scientific and technical progress to keep pace with global developments. The mission aims to achieve the following: 1. Utilizing computer and internet technologies in education and training.

2. Engaging with the community in the field of mechanical industries and devices, and strengthening the relationship with the private sector in industry, training, and technical qualification.
3. Developing future plans to enhance educational and training curricula and graduate technical cadres in the field of electricity.
4. Focusing on scientific research among academics in the department and industrial staff to solve electrical energy problems and improve production.

3-Program Objectives:

1. To prepare technical personnel in the field of electricity, equipped with both scientific and practical skills to operate and maintain electrical units in power generation, transmission, and distribution stations, as well as to maintain devices and equipment within the department and institute facilities.
2. To develop students psychologically to fulfill their roles in the field of electrical specialization.
3. To enhance the curriculum in alignment with labor market demands and provide high-quality services to the community by strengthening relationships with both the private and public sectors.

4- Program Accreditation

ABET

5- Other External Influences

Labor market and private sector

6 -Program Structure

Program Structure:	Number of Courses	Credit Units	Percentage	Notes
Institutional Requirements	**3**	**6**	**4.7%**	
College Requirements	**6**	**26**	**20.6%**	
Departmental Requirements	**13**	**94**	**74.6%**	

Summer Training	**Two months equivalent to one Academic year**	**-**	**-**	

7- Program Description			
Year	**Course Name**	**Credit Hours**	
		TH.	**Pract.**
First	**Electrical Circuits and Measurements**	**2**	**2**
First	**Electrical Installations**	**2**	**2**
First	**Electronic**	**2**	**2**
First	Workshop Laboratories	**-**	**6**
First	**Mathematics**	**2**	**-**
First	**Computer Applications**	**1**	**2**
First	**Engineering and Electrical Drawing**	**-**	**3**
First	**Human Rights and Democracy**	**1**	**-**
First	**Occupational Safety**	**2**	**-**
First	**Digital Electronics**	**2**	**2**
First	**English Language**	**1**	**-**
Second	**Electrical Machines**	**2**	**3**
Second	**Power transmission Networks**	**2**	**2**
Second	**Power Electronics**	**2**	**3**
Second	**Maintenance Workshop**	**-**	**4**
Second	**Electrical Installations**	**2**	**2**
Second	**Computer Applications**	**1**	**2**
Second	**Electrical Drawing**	**-**	**3**
Second	**Programmable Logic Controller (PLC)**	**1**	**2**
Second	**Project**	**-**	**2**
Second	**English Language**	**1**	**-**

8. Expected Learning Outcomes of the Programme	
Knowledge	
A1 - Understanding and teaching students the fundamentals of electrical theories and circuit analysis. A2 - The ability to operate and maintain electrical units in power stations. A3 - The ability to install and maintain underground and	

overhead cables. A4 - The ability to create electrical schematics using computer software.	
Skills	
B1 - The student's ability to implement and maintain electrical networks in residential and industrial settings.	
B2 - Equipping students with the skill to diagnose electrical faults and solve practical problems in electrical networks.	
B3 - The ability to implement electrical installations in homes and residential buildings.	
B4 - The ability to use a computer for simulating electrical circuits.	
Values	
C1 - Providing students with practical skills in labs and workshops.	
C2 - Equipping students with the ability to think critically in problem-solving.	
C3 - Guiding students to value and maintain the department and institute's property.	
C4 - Developing students' research skills on the internet.	

9. Teaching and Learning Strategies

1 - Utilising modern tools in teaching and training students.
2 - Forming discussion groups during lectures to explore study topics.
3 - Assigning students extracurricular tasks.

10. Evaluation Methods

1 - Daily examinations.
2 - Monthly and final examinations.
3 - Extracurricular assignments and weekly lab reports.

11. Faculty Members

Faculty Preparation		Specific Requirements/Skills (if any)		Specialisation		Academic Rank
Instructor	**Staff**			**Specific**	**General**	
	5				**Electrical Engineering**	**Lecturer**
	4			**Communications and Electronics**	**Electrical Engineering**	**Assistant Lecturer**
	6			**Electrical Power**	**Electrical Engineering**	**Assistant Lecturer**

12. Admission Criteria

The Electrical Technology Department is subject to the central admission system of the Ministry of Higher Education and Scientific Research, where graduates from the scientific branch of secondary education are nominated, in addition to 60%.

13. Major Sources of Information about the Programme

1 - Regulations and recommendations from sectoral and joint committees.
2 - Monitoring the latest releases on websites and in public libraries.
3 - Personal experience.

14. Programme Development Plan

Continuous planning is conducted to enhance the academic and administrative journey and to overcome all difficulties and obstacles faced by the educational programme.
Procedures followed:
1- Organising scientific conferences, seminars, and discussion forums for students.
2- Developing faculty members and technicians by involving them in training programmes and workshops both within and outside the institute.

Programme Skills Plan															
Required Learning Outcomes of the Programme															
Values				Skills				Knowledge				**Core or Elective**	**Title**	**Course Code**	**Year / Level**
C4	**C3**	**C2**	**C1**	**B4**	**B3**	**B2**	**B1**	**A4**	**A3**	**A2**	**A1**				
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**Core**	**Power Electronics**	**KTED123**	Second Year
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**Core**	**Electrical Circuits and Measuremen**	**KTED111**	First Year

Description of the materials for the first course - first stage

Ministry of Higher Education and
Scientific Research – Iraq
Al-Furat Al-Awsat Technical University
Polytechnic College - Karbala
Department of Electrical Techniques Engineering

Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Electronic Essentials**			**Module Delivery**	
Module Type	**Core**			√ **Theory** **Lecture** √ **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	**ETE-112-22-PM**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	**UGI**		**Semester of Delivery**		**1**
Administering Department	**Department of Electrical Engineering Techniques**		**College**	**Al-Furat Al-Awsat Technical University Polytechnic College - Karbala**	
Module Leader	**Karrar Ali Kzar**		**e-mail**	**karrar.simawi@atu.edu.iq**	
Module Leader's Acad. Title	**Assist. Lect.**		**Module Leader's Qualification**	**Master**	
Module Tutor	**None**		**e-mail**	**None**	
Peer Reviewer Name	**None**		**e-mail**	**None**	
Review Committee Approval	**13/10/2025**		**Version Number**		**1.0**

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- Understanding the Basics: The primary objective of the Electronic Basic course is to provide students with a solid foundation in the basic principles of how electronic circuits work and how they are made from semiconductor materials. 2-Analyzing Circuit Components: Students will understand how the p-n junction is formed and how it is manufactured, as well as understanding and analyze the electronic circuits in which the diode is included, like as rectifier circuit , clipping circuit ,clamper circuit, and others. the student will also learn the principle of operation of BJT transistor 3-Circuit Laws and Theorems: Students will become familiar with important laws and theorems governing the diode and transistor applications circuits. They will gain proficiency in applying these principles to solve complex circuit problems. 4-Circuit Simulation and Design: The course may involve introducing students to

	circuit simulation software. They will learn how to use simulation tools to analyze and design electronic circuits, verify their calculations, and gain practical insights into circuit behavior. 5-Problem-Solving Skills: An important objective is to develop students' problem-solving skills in the context of electronic circuits. They will learn how to analyze circuit diagrams, formulate appropriate strategies, and apply their knowledge to solve a variety of circuit problems efficiently. 6-Laboratory Skills: The course includes hands-on laboratory experiments to provide students with practical experience in building, testing, and troubleshooting electronic circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Fundamental Knowledge: Students will acquire a solid understanding of the fundamental concepts and principles of electronic circuits that's contain diode and transistor. 2-Circuit Analysis Skills: Students will develop the ability to analyze electronic circuits such as rectifier circuit , clipping circuit , clamper circuits, Zener circuits , and amplifier circuits 3-Circuit Design and Simulation: Students will be able to design and simulate electronic circuits, using appropriate components and considering design constraints. They will learn to use circuit simulation software to verify their designs, analyze circuit performance, and troubleshoot circuit issues. 4-Laboratory Skills: Through hands-on laboratory experiments, students will develop practical skills in building, testing, and troubleshooting electronic circuits. They will become proficient in using measuring instruments, interpreting experimental data, and ensuring safety precautions while working with electrical circuits. 5-Critical Thinking and Analysis: The course will promote critical thinking and analytical skills among students. They will learn to evaluate different circuit solutions, analyze circuit behavior, and make informed decisions based on their understanding of electronic circuits. By the end of the course, students will possess a comprehensive knowledge of electronic circuits, enabling them to analyze, design, and troubleshoot a wide range of electrical circuits. They will be prepared for further studies in electrical engineering or related fields and equipped with skills that can be applied in professional practice.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – semiconductor device. The composition of the atoms and materials used in the manufacture of semiconductor materials and the specifications of each material. In addition to that, how to form the p-type semiconductor and the N-type semiconductor, and how to manufacture the diode .[12 hrs] • Part B - diode circuits. Rectifier circuits, clipping circuits, clamper circuits. Multiplier circuits. [16 hrs] • Part C - zener and transistor circuit zener regulator circuits, the LED circuit, the Photo diode circuit. And bjt circuits. [26 hrs] • Revision problem classes [6 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	

	1-**Hands-on Experiments:** Engage students in practical experiments to deepen their understanding of circuits. 2-**Simulation Software:** Use circuit simulation software for virtual circuit design and analysis. 3-**Problem-solving Exercises:** Include various problem-solving exercises to apply circuit analysis techniques. 4-**Group Projects:** Assign collaborative projects for circuit design and construction. 5-**Real-world Applications:** Discuss practical applications of circuits in different devices and systems. 5-**Interactive Discussions:** Encourage student participation and critical thinking through open-ended questions. 6-**Conceptual Understanding:** Focus on intuitive understanding alongside mathematical analysis. 7-**Assessment Variety:** Use diverse assessment methods to gauge student understanding. 8-**Office Hours and Support:** Offer individualized assistance through office hours or online support.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 5
	Assignments	2	10% (10)	12	LO # 3, 4
	Projects / Lab.	4	10% (10)	Continuous	All
	Report	8	10% (10)	Continuous	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO # 1-5
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
1	Semiconductors materials
2	PN junction, introduction and characteristics
3	Diode applications , clipping circuit
4,5	Clamper circuit , voltage doubler ,voltage tripler and voltage quadreplier
6,7	half wave rectifier and full wave bridge rectifier
8	Filter circuits for half wave and full wave
9	Center-tapped rectifier
10, 11	Special purpose diodes (Zener diode , photo diode, LED)

12	Introduction to Bipolar Junction Transistors (BJT)
13	BJT circuit analysis and characteristics
14	Field effect transistor FET (Introduction and characterstics)
15	Final Examination

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
1	Lab 1: Diode characteristics
2	Lab 2: Clipping circuits
3	Lab 3: Clamper circuits
4	Lab 4: Voltage doubler
5	Lab 5: Voltage tripler and quadrepier
6	Lab 6: Rectifier circuits , half wave rectifier , full wave bridge rectifier
7	Lab 7: Half wave rectifier and full wave bridge rectifier with filter
8	Lab 8: Center taped rectifier
9	Lab 9: Zener diode characteristics
10	Lab 10: Zener diode regulation and clipping
11	Lab 11: Bipolar Junction Transistors (BJT) characteristics
12	Lab 12: BJT small signal amplifier
13	Lab 13: Field effect transistor FET characteristics
14	Lab 14: Review

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas L. Floyd "Electronic Devices Conventional Current Version"	Yes
Recommended Texts	Robert L. Boylestad , Louis Nashelsky "Electronic Devices and Circuit Theory"	No
Websites		

APPENDIX:

GRADING SCHEME

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A** – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings

	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Ministry of Higher Education and
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Polytechnic College - Karbala
Department of Electrical Techniques Engineering

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Digital electronics**	**Module Delivery**
Module Type	**Core**	**√ Theory Lecture √ Lab Tutorial Practical Seminar**
Module Code	**ETE-114-22-PM**	
ECTS Credits	**5**	
SWL (hr/sem)	**125**	

Module Level	**UGI**	**Semester of Delivery**	**1**
Administering Department	**Department of Electrical Engineering Techniques**	**College**	**Al-Furat Al-Awsat Technical University Polytechnic College - Karbala**
Module Leader	**Saif Saad Hussien**	**e-mail**	**saif.saad@atu.edu.iq**
Module Leader's Acad. Title	**Assist. Lect.**	**Module Leader's Qualification**	**Master**
Module Tutor	**None**	**e-mail**	**None**
Peer Reviewer Name	**None**	**e-mail**	**None**
Scientific Committee Approval Date	**13/10/2025**	**Version Number**	**1.0**

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	**1-Training students on the basics of logical circuits used in electronic computers and how they work.** **2- Building logical circuits and learning about computer operation.**
Module Learning Outcomes	1. Learning about the different number systems. 2. Learning the arithmetic operations related to different number systems. 3. Learning the different logic gates of computer system and their work.

مخرجات التعلم للمادة الدراسية	4. Ability to design, simplify and implement different logical and arithmetic circuits that considered the basic of digital system. 5. Ability to design, simplify and implement different sequential circuits, counters and shift registers.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part 1 – Numbers Systems, Operations, and Codes Different Number Systems, Data representation (integer and fraction) using different number systems. Conversion Between Different Numbers Systems. Arithmetic operations using different number systems, and Digital Codes (BCD, Parity, Gray, etc.) [10 hrs] • Part 2- Logic Gates The Inverter (NOT Gate), AND Gate, OR Gate, NAND Gate, NOR Gate, the Exclusive-OR Gate and Exclusive-NOR Gates. [8 hrs] • Part 3 Boolean Algebra and Logic Simplification Boolean Operations and Expressions, Laws and Rules of Boolean Algebra, Simplification Using Boolean Algebra, DeMorgan's theorems,The Karnaugh Map (1, 2 , 3 and 4 variables) , SOP and POS Minimization. [8 hrs] • Part 4 Combinational Logic Analysis Basic Combinational Logic Circuits, Implementing Combinational Logic, Combinational Logic Using NAND and NOR Gates, Logic Circuit Operation with Pulse Waveform Inputs. [10 hrs] Revision problem classes [10 hrs] • Part 5 – Functions of Combinational Logic. Half , Full and Parallel Binary Adders and Subtractors. 1's and 2's Complement Subtractor, 2's Complement Adder-Subtractor, BCD Adder, etc. Comparators, Decoders, Encoders, Multiplexers, Demultiplexer [10 hrs] • Part 6- Latches, Flip-Flops, and Timers. Latches, Edge-Triggered Flip-Flops. Flip-Flop operating (R-S, T, J-K ,D) [12 hrs] • Part 7Counters Synchronous Counters, Asynchronous Counters. Design of Counters. [8 hrs] • Part 8 Shift Registers Basic Shift Register Operations: SISO, SIPO, PISO, PIPO, Bidirectional and special Types Shift Register. [6 hrs] • Revision problem classes [6 hrs] • Part 9– Microprocessor Introduction to Microprocessor: component of microprocessor, Microprocessor architecture [6 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	3,5 and 10	LO # 1,#3,and #4
	Assignments	3	10% (10)	2 and 12	2,3
	Projects / Lab.	9	10% (10)	Continuous	All
	Report	3	10% (10)	2 and 12	LO #3, #4 and #5
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	LO #1 - #5
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1,2	• **The numerical systems – the binary system, the decimal system, the hexadecimal system.** • **Conversion from binary to decimal and vice versa. Conversion from decimal to octal.** • **Conversion from decimal to hexadecimal and vice versa. Conversion from binary to octal and vice versa. Conversion from hexadecimal to binary and vice versa.** • **Addition and subtraction in the binary system.** • **Using complements 1's and 2's in binary subtraction.**
Week 3,4	• **Logic gates – fundamentals of logic gates:** • **AND gate – OR gate – NOT gate.** • **Representing logic gates using switches.** • **AND gate – using diodes and resistors.** • **NOT gate – using diodes and resistors.** • **AND gate – using transistors.** • **NAND gate – NOR gate – XOR (exclusive OR) gate.** • **Implementing different logic gates using the exclusive OR (XOR) gate once again**
Week 5	• **Basic definitions, basic theorem and properties, Boolean functions**
Week 6	• **Canonical and Standard forms Digital Logic Gates**
Week 7	• **Karanough Maps: AND- OR implementation, don't care conditions**
Week 8	• **Subtractions, half and full adders and subtractions, binary parallel address**
Week 9	• **decoders, encoders, comparators**

Week 10,11	• **multiplexers and demultiplexers**
Week 12	• **Flip-flops (RS, T, D, JK …)** • **Master slave FF, counter** • **shift registers**
Week 13	• **Introduction to Microprocessor** • **Microprocessor architecture**
Week 14	• **component of microprocessor**
Week 15	• **Final Examination**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	**Introduction to digital laboratory kit operation**
Week 2	**Logic Gates (AND, NOT, NAND) with examples.**
Week 3	**Logic Gates (OR, , NOR) with examples.**
Week 4	**Logic Gates (XOR, XNOR) with examples.**
Week 5	**De Morgan's Theorems** 1^{st} and 2^{nd} Laws.
Week 6	**Designing a combinational Logic circuit.**
Week 7	**Half Binary Subtractor.**
Week 8	**Full Binary Subtractor**
Week 9	**Flip-flops (RS, T, D, JK …)**
Week10	**shift registers**
Week 11	**Binary comparator**
Week 12	**The realization of the Boolean equation.**
Week 13	**2's Complement Adder- Subtractor**
Week 14	**Flip-Flop.**
Week 15	**Final Examination**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas L. Floyd, Digital Fundamentals, 11th Edition, Pearson Education 2015	Yes
Recommended Texts	1- Introduction to Digital Logic with Laboratory Exercises/James Feher, 2009. 2- M. Morris Mano, Michael D. Ciletti, Digital Design, 5th edition, Pearson Education 2013.	No
Websites	Digital Systems: From Logic Gates to Processors: https://www.coursera.org/learn/digital-systems	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Ministry of Higher Education and
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Al-Furat Al-Awsat Technical University
Polytechnic College - Karbala
Department of Electrical Techniques Engineering

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Engineering Drawing**			**Module Delivery**	
Module Type	**Basic**			**Theory** **Lecture** √ **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	**ETE-113-22-PM**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	**UGI**	**Semester of Delivery**		**1**	
Administering Department	**Department of Electrical Engineering Techniques**	**College**	**Al-Furat Al-Awsat Technical University Polytechnic College - Karbala**		
Module Leader	**Zaid Jabbar Obaid**	**e-mail**	**zaid.obaid@atu.edu.iq**		
Module Leader's Acad. Title	**Lecturer**	**Module Leader's Qualification**		**Master**	
Module Tutor	**None**	**e-mail**	**None**		
Peer Reviewer Name	**None**	**e-mail**	**None**		
Scientific Committee Approval Date	**13/10/2025**	**Version Number**	**1.0**		

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To explore further and confirm the reference of engineering drawing to the varied design applications found in engineering and technology in general.

	2. To further the ability to communicate information by engineering drawings. 3. To develop knowledge to two dimensional (2D) computer-aided drawing(CAD). n Further and/or Higher Education who are required to learn how to use the computer-aided design (CAD) software package AutoCAD®
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	6. Learning types of engineering lines and their uses and how to draw 7. Drawing geometric shapes such as square, rectangular, parallelogram and circle 8.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: ● Part A – AutoCAD interface Setup, save, limits, grid, object snap and ortho mode [3 hrs.] ● Part B- Coordinate method Direct distance method, Absolute coordinate, Relative coordinate, Polar coordinate[3hrs] ● Part C Draw menu Line, polyline, rectangle, arc, circle, ellipse and hatch [12hrs] ● Part D Modify and Properties menu Copy, move, offset, erase, extend, trim and array, line shape and line size [9 hrs.] ● Part D Projection Front, side and top ortho projections [6 hrs.] ● Part E stereoscopic shapes Method for drawing stereoscopic shapes[6hrs] Revision problem classes [8 hrs.]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Drawing engineering is an engineers language and consider a means to communicate between them and designers The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	5 and 10	LO #1, #2
	Assignments	8	10% (10)	2 and 12	LO #3
	Projects / Lab.	18	10% (10)	Continuous	All
	Report	0	10% (10)		
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - 3
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
1	Introducing AutoCAD
2	Methods of drawing a straight line using the Cartesian coordinate method, the relative method, and the polar method
3	Drawing accuracy command (SNAP, GRID, ORTHO, POLAR, OSNAP) Drawing isometric objects using the GR grid command
4 ,5	Drawing Tools: Line, Circle, Arc, Ellipse, Donut, Polygon, Rectangle, Point.
6 ,7	Modify Tools Erase, Undo, Redo, Move, Copy, Rotate, Mirror, Array, Scale, Trim, Extend, Chamfer, Fillet.
8	Dimension - Linear, Aligned, Radius, Diameter, Center Mark, Angle, Arc length, Continuous, Baseline, Tolerance, Dimension Space, Dimension Break, Jogged radius, Ordinate dimensions.
9	Annotation Tools Text, Style, Mtext, Scale text, Spell,
10	Hatching Objects
11	Drawing perspective
12,13	Drawing electrical circuits Using the program library to use symbols found in the Design Center Drawing symbols not found in the program Save symbols in a special file for use in new files
14	Exercises drawing
15	Final Examination

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	ENGINEERING GRAPHICS FOR First Year Student Specialized Scientific Programs (SSP) Faculty of Engineering Alexandria University Prepared By Assoc. Prof. / Raafat El sayed Shaker Ismail Introduction to AutoCAD 2011. 2D and 3D Design by Alf Yarwood	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

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Department of Electrical Techniques Engineering

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**English Language I**			**Module Delivery**	
Module Type	**Suplement**			√ **Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	**ATU10**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	**UGI**		**Semester of Delivery**	**1**	
Administering Department	**Department of Electrical Engineering Techniques**		**College**	**Al-Furat Al-Awsat Technical University** **Polytechnic College – Karbala**	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Review Committee Approval	**13/10/2025**		**Version Number**	**1.0**	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Unit one: Introduce yourself and others using am/are/is and my/your. Practice saying hello and goodbye in different situations. Unit two: Talk about your hobbies, interests and activities using he/she/they and his/her. Practice asking and answering questions. Unit three: Describe yourself and others using adjectives and nouns. Practice giving personal information. Unit four: Talk about your family and friends using possessive adjectives, possessive 's and has/have. Practice describing relationships and appearance. Unit five: Talk about your daily routine and habits using present simple with I/you/we/they, a and an. Practice telling the time and date. Unit six: Talk about your work or school life using present simple with he/she, questions, negatives and adverbs of frequency. Practice expressing likes and dislikes. Unit seven: Talk about your favorite things using question words, pronouns and this/that. Practice making comparisons and preferences. Unit eight: Talk about your home and neighborhood using there is/are and prepositions of place. Practice describing location and giving directions. Unit nine: Talk about your past experiences using was/were born and past simple with irregular verbs. Practice telling stories and biographies. Unit ten: Talk about your recent holidays or events using past simple with regular and irregular verbs, questions, negatives and ago. Practice narrating events in chronological order. Unit eleven: Talk about your abilities and skills using can/can't and adverbs. Practice making requests and offers. Unit twelve: Talk about your shopping habits and needs using some/any, like/would like and thank you. Practice ordering food and buying things.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Unit one: Student will be able to introduce himself and others in a polite and friendly way using basic grammar and vocabulary. Unit two: Student will be able to talk about his hobbies, interests and activities in simple sentences using subject pronouns and possessive adjectives. Unit three: Student will be able to describe himself and others using adjectives and nouns in positive and negative sentences. Unit four: Student will be able to talk about his family and friends using possessive adjectives, possessive 's and has/have in statements and questions. Unit five: Student will be able to talk about his daily routine and habits using present simple with I/you/we/they, a and an in affirmative and negative sentences. Unit six: Student will be able to talk about his work or university life using present simple with he/she, questions, negatives and adverbs of frequency in different contexts. Unit seven: Students will be able to talk about their favorite things using question words, pronouns and this/that in short answers and comparisons. Unit eight: Students will be able to talk about their home and neighborhood using there is/are and prepositions of place in descriptions and directions. Unit nine: Student will be able to talk about his past experiences using was/were born and past simple with irregular verbs in statements and questions. Unit ten: Student will be able to talk about his recent holidays or events using past simple with regular and irregular verbs, questions, negatives and ago in narratives and sequences. Unit eleven: Student will be able to talk about his abilities and skills using can/can't and adverbs in statements and questions. Student will also be able to make requests and offers using can/can't. Unit twelve: Students will be able to talk about their shopping habits and needs using some/any, like/would like and thank you in statements and questions. Student will also be able to order food and buy things using polite language.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – General meeting and introduction. This section provides an overview of Hello, Am/Are/Is, My/Your, This is with Practice in Work, Your World, He/She/They, His/Her, Questions. [6 hrs] • Part B Every day. Vocabulary related to different topics. Possessive adjectives, Possessive's,

	Has/have, Adjective+ noun. Present simple I/you/we/they, A and an [10 hrs] • Part C Time and event. Present simple, Questions and negatives, Adverbs of frequency. Question words, Pronouns, This and that. There is/are…, Prepositions [8 hrs] • Revision problem classes [4 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	**Building relationships and appreciating their culture:** Teachers should take the time to learn about their students' cultures and backgrounds. **Using actions and gestures to show what to do:** Teachers can use nonverbal cues such as pointing, gesturing, and facial expressions to help students understand what they are trying to communicate. **Planning lessons and using language objectives:** Teachers should plan lessons that are appropriate for their students' language proficiency levels. **Provide opportunities for students to work in pairs or small groups:** Working in pairs or small groups can help students who are learning English as a new language practice their speaking skills in a less intimidating environment. **Use visuals such as pictures, diagrams, and graphic organizers:** Visuals can help students who are learning English as a new language understand complex concepts more easily. **Provide opportunities for students to use technology:** Technology can be used to support English-language learners by providing access to online resources such as videos, podcasts, and interactive activities. **Encourage students to read widely:** Reading widely can help students who are learning English as a new language improve their vocabulary and comprehension skills 2.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	4	10% (10)	2, 12	LO # 3-12
	Projects / Lab.				
	Report				
Summative	**Midterm Exam**	2 hr	10% (10)	8	LO # 1-8

assessment	**Final Exam**	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
1	Unit one: hello, Am/are/is, my/your, This is with practice in work.
2	Unit two: your world, He/she /they, his/her, Questions.
3	Unit three: all about.
4	Unit four: family and friends, Possessive adjectives, Possessive's, Has/have, Adjective+ noun.
5	Unit Five: the way I live, Present simple l/you /we /they, A and an.
6	Unit six: every day, Present simple he/she, Questions and negatives, Adverbs of frequency.
7	Unit seven: my favorites, Question words, Pronouns, This and that
8	Unit eight: where I live, There is /are..., Prepositions
9	Unit nine: times past, Was /were born, Past simple -irregular verbs.
10	Unit ten: we had a great time!, Past simple regular & irregular, Question, Negatives and Ago.
11	Unit eleven: Can /can't, Adverbs, Requests, I can do that.
12	Unit twelve: please I'd like..., Some and any, Like and would like and thank you.
13	Unit thirteen: here and now, Present continuous, Present simple & present continuous.
14	Unit fourteen: it's time to go!, Future plans, Revision writing email and informant letter.
15	Final Examination

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	New Headway Beginner Fourth Edition	Yes
Recommended Texts	New Headway Beginner Workbook	Online
Websites	https://elt.oup.com/student/headway/beg/?cc=global&selLanguage=en	

APPENDIX:

GRADING SCHEME

مخطط الدرجات

Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors
	C - Good	جيد	70 – 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

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Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Human Rights and Democracy			Module Delivery
Module Type	Suplement			√ Theory Lecture Lab Tutorial Practical Seminar
Module Code	ATU13			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	UGI		Semester of Delivery	1
Administering Department	Department of Electrical Engineering Techniques		College	Al-Furat Al-Awsat Technical University Polytechnic College - Karbala
Module Leader	Talal Mudhafar Gazi		e-mail	talal.almasuode@atu.edu.iq
Module Leader's Acad. Title	Assist. Lect.		Module Leader's Qualification	Master
Module Tutor	None		e-mail	None
Peer Reviewer Name	None		e-mail	None
Review Committee Approval	13/10/2025		Version Number	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	None
Co-requisites module	None	Semester	None

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1- التعرف على مفاهيم حقوق الإنسان والديمقراطية وأحوالها في الحضارات القديمة والأديان السماوية. 2- يدرس كيفية تعامل الدين الإسلامي الحنيف مع حقوق الإنسان الدينية والدنيوية، ويوضح أن الإسلام العظيم منح الفرد حقوقاً عظيمة كثيرة قبل ولادته وبعد مماته. 3- يتعرف على أنواع حقوق الإنسان والمبادئ الديمقراطية والضمانات الواردة في دستور جمهورية العراق لعام 2005. 4- فهم ودراسة ما ورد في الاتفاقيات الدولية وأهمها الإعلان العالمي لحقوق الانسان الاعلان الفرنسي لحقوق الإنسان والمواطن عام 1789. 5- أن يكون قادراً على توسيع فهمه لمفهوم الضمانات الوطنية لحقوق الإنسان، وخاصة الضمانات الدستورية العامة والخاصة. 6- توضيح مفهوم الديمقراطية وخصائها وفهم انواع النظم السياسية والتي تعد ضمانه لحقوق الانسان وحرياته السياسية ومحاولة تطبيقه على ارض الواقع .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	هام: اكتب على الأقل 6 مخرجات تعليمية، ومن الأفضل أن تكون مساوية لعدد أسابيع الدراسة. 1- معرفة وفهم ماهية الحقوق والحريات العامة وجذورها التاريخية. 2- التعرف على أنواع حقوق الإنسان المنصوص عليها في الدستور العراقي النافذ. 3- التعرف على ضمانات حقوق الإنسان.

4- يحدد المهارات الخاصة بالموضوع والعناصر الضرورية التي تتكون منها هذه المادة. 5- التمييز بين النظرية والتطبيق في مجال حقوق الإنسان والمبادئ الديمقراطية. 6- يقوم على دراسة واقع حقوق الإنسان في العراق. 7- يحدد الطريقة المناسبة التي يتم بموجبها حماية حقوق الإنسان من الانتهاكات. 8- أن يكون قادرًا على التعلم بشكل مستقل وتطوير وإظهار المهارات التصريحية. 9- أن يكون قادراً على امتلاك التفكير القانوني المستقل. 10- يجب أن يكون لديه هدف واضح يسعى لتحقيقه.	
يتضمن المحتوى الإرشادي ما يلي. الجزء أ حقوق الإنسان مقدمة في حقوق الإنسان والديمقراطية (SSWL=15) الحق في المساواة أمام القانون والوظائف العامة والواجبات والأعباء. (SSWL=10) الوسائل القانونية لحماية حقوق الإنسان، مبدأ الفصل بين السلطات، الحماية الدستورية. (SSWL=15) الجزء ب تحديد ضرورة الديمقراطية وحماية حقوق الإنسان وحرياته الحماية من الفقر والمرض والشيخوخة والعجز.(SSWL=10) مبادئ الديمقراطية ونظم الحكم. (SSWL=15) الضمانات الأساسية لنجاح الحريات العامة وسيادة القانون والرأي العام وغيرها. (SSWL=10) (الجدول الزمني ساعات × 15 أسبوعًا)	**Indicative Contents** المحتويات الإرشادية

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

استراتيجيات وأساليب التعليم والتعلم: **1- طريقة المحاضرة العلمية.** **2- أسلوب المناقشة من خلال طرح أسئلة على الطلاب تساعدهم على تعلم التحليل العلمي.** **3- تشجيع الطلاب على الحوار وطرح الأسئلة والأفكار والآراء المبتكرة.** **4- العصف الذهني.** 5- استراتيجية التفكير الناقد في التعلم	**Strategies**

Student Workload (SWL)
الحمل الدراسي للطالب

2.2	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	33	**Structured SWL (h/sem)** الحمل الدراسي المنتظم للطالب خلال الفصل

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	7	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	9	10% (10)	Continuous	All
	Report	8	10% (10)	2, 12	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO # 1-8
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
1	**حقوق الانسان ، تعريفها ، أهدافها**
2	**حقوق الانسان في الحضارات القديمة وخصوصا وادي الرافدين**
3	حقوق الانسان في الشرائع السماوية مع التركيز على حقوق الانسان في الإسلام
4	**حقوق الإنسان في الإسلام والأديان السماوية الأخرى**
5	**حقوق الانسان في التاريخ المعاصر والحديث**
6, 7, 8	**حقوق الإنسان في التشريع الدولي**
9	**حقوق الإنسان في دستور جمهورية العراق لسنة 2005**
10, 11	**المنظمات غير الحكومية وحماية حقوق الانسان**
12, 13, 14	**ضمانات احترام وحماية حقوق الانسان على الصعيد الدولي**
15	**الامتحان النهائي**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**د. حامد خالد حنون، حقوق الإنسان، مكتبة السنهوري، بيروت، 2015**	No
Recommended Texts	**د. محمد بن سيف الكواري، حقوق الإنسان والتنمية المستدامة، 2020**	No

Websites	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Ministry of Higher Education and Scientific Research – Iraq
Al-Furat Al-Awsat Technical University
Polytechnic College - Karbala
Department of Electrical Techniques Engineering

Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	**DC Electrical Circuits**	**Module Delivery**
Module Type	**Core**	√ **Theory**

Module Code	**ETE-111-22-PM**			**√ Lecture Lab Tutorial Practical Seminar**	
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	**UGI**		**Semester of Delivery**		**1**
Administering Department	**Department of Electrical Engineering Techniques**		**College**	**Al-Furat Al-Awsat Technical University Polytechnic College - Karbala**	
Module Leader	**Hiba Yasin Theban**		**e-mail**	**hiba.theban@atu.edu.iq**	
Module Leader's Acad. Title	**Assist. Lect.**		**Module Leader's Qualification**		**Master**
Module Tutor	**None**		**e-mail**	**None**	
Peer Reviewer Name	**None**		**e-mail**	**None**	
Review Committee Approval	**13/10/2025**		**Version Number**		**1.0**

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1-Understanding the Fundamentals: The primary objective of a DC circuits course is to provide students with a solid foundation in the fundamental principles of direct current (DC) circuits. This includes concepts such as voltage, current, resistance, Ohm's law, power, and energy. 2-Analyzing Circuit Components: Students will learn how to analyze and work with various circuit components. They will understand their behavior in DC circuits and be able to calculate their effects on voltage, current, and power. 3-Circuit Laws and Theorems: Students will become familiar with important laws and theorems governing DC circuits, including Ohm's law, Kirchhoff's laws (KCL and KVL), Thevenin's theorem, Norton's theorem, and maximum power transfer theorem. They will gain proficiency in applying these principles to solve complex circuit problems. 4-Circuit Simulation and Design: The course may involve introducing students to circuit simulation software. They will learn how to use simulation tools to analyze and design DC circuits, verify their calculations, and gain practical insights into circuit behavior. 5-Problem-Solving Skills: An important objective is to develop students' problem-solving skills in the context of DC circuits. They will learn how to analyze circuit diagrams, formulate appropriate strategies, and apply their knowledge to solve a variety of circuit problems efficiently. 6-Laboratory Skills: The course includes hands-on laboratory experiments to provide students with practical experience in building, testing, and troubleshooting DC circuits.
Module Learning Outcomes	1-Fundamental Knowledge: Students will acquire a solid understanding of the fundamental concepts and principles of direct current (DC) circuits, including voltage, current, resistance, power, and energy. 2-Circuit Analysis Skills: Students will develop the ability to analyze DC circuits using

مخرجات التعلم للمادة الدراسية	various techniques such as applying Kirchhoff's laws, performing nodal and mesh analysis, and utilizing circuit theorems like Thevenin's and Norton's theorem. They will gain proficiency in solving complex circuit problems and calculating circuit parameters. 3-Circuit Design and Simulation: Students will be able to design and simulate DC circuits, using appropriate components and considering design constraints. They will learn to use circuit simulation software to verify their designs, analyze circuit performance, and troubleshoot circuit issues. 4-Laboratory Skills: Through hands-on laboratory experiments, students will develop practical skills in building, testing, and troubleshooting DC circuits. They will become proficient in using measuring instruments, interpreting experimental data, and ensuring safety precautions while working with electrical circuits. 5-Critical Thinking and Analysis: The course will promote critical thinking and analytical skills among students. They will learn to evaluate different circuit solutions, analyze circuit behavior, and make informed decisions based on their understanding of DC circuits. By the end of the course, students will possess a comprehensive knowledge of DC circuits, enabling them to analyze, design, and troubleshoot a wide range of electrical circuits. They will be prepared for further studies in electrical engineering or related fields and equipped with skills that can be applied in professional practice.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – General Electric System. Constituent parts of an electrical system (source, load, communication & control), Current flow in a circuit, Electromotive force and potential difference, Electrical units. Ohm's law, Resistors, Resistivity, Temperature rise & Temperature coefficient of resistance, Voltage & Current sources [8 hrs] • Part B DC circuits. Series circuits, Parallel circuits. Kirchhoff's laws. Power and energy [14 hrs] • Part C Network Theorems . Star-delta & delta-star transformation. Sources transformations Mesh analysis. Nodal analysis. Superposition theorem. Thevnin's theorem. Norton's theorem. Maximum power transfer theorem. [32 hrs] • Revision problem classes [6 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1-**Hands-on Experiments:** Engage students in practical experiments to deepen their understanding of circuits. 2-**Simulation Software:** Use circuit simulation software for virtual circuit design and analysis. 3-**Problem-solving Exercises:** Include various problem-solving exercises to apply circuit analysis techniques. 4-**Group Projects:** Assign collaborative projects for circuit design and construction. 5-**Real-world Applications:** Discuss practical applications of circuits in different devices and systems. 5-**Interactive Discussions:** Encourage student participation and critical thinking through open-ended questions. 6-**Conceptual Understanding:** Focus on intuitive understanding alongside mathematical

	analysis. 7-**Assessment Variety:** Use diverse assessment methods to gauge student understanding. 8-**Office Hours and Support:** Offer individualized assistance through office hours or online support.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	5	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	2	10% (10)	Continuous	All
	Report	8	10% (10)	2, 12	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO # 1-8
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
1	**Fundamental electric quantities: voltage, current, power and energy**
2, 3, 4	• **Resistance, capacitance and inductance** **Dependent and Independent source.**
5	• **Series and parallel resistors** **voltage and current division**
6	**Kirchhoff's laws (KVL & KCL).**
7	**• Conversion of delta-connected resistance into an equivalent Wye connection & vice versa.**
8,9,10	• **Mesh analysis** **Node analysis**
11	• **Superposition's theorem.**
12,13	• **Thevenin's theorem** **Norton's theorem.**
14	**• Maximum power transfer.**
15	**• Final Examination**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
1	**Introduction to Measurement Devices**
2	**Color of Resistance**
3,4	**Ohm's Law and Resistance in Series and Parallel**
5,6	**Star& Delta Connection**
7	**Kirchhoff's Law**
8	**MID-TERM EXAM**
9,10	**Super Position Theorem**
11,12	**Thevenin's Theorem**
13,14	**Norton's Theorem & Maximum Power Transfer**
15	**Review**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Charles K. Alexander, Matthew N.O. Sdiku Fundamentals of Electrical Engineering, 4th Edition, 2009	Yes
Recommended Texts	Tony R. Kuphaldt, Lessons In Electric Circuits, Volume I - DC 5th edition, Pearson Education 2002	No
Websites	**Direct Current (DC)** https://www.allaboutcircuits.com/textbook/direct-current/	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Ministry of Higher Education and Scientific Research – Iraq
Al-Furat Al-Awsat Technical University
Polytechnic College - Karbala
Department of Electrical Techniques Engineering

Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Differential Mathematics**			**Module Delivery**	
Module Type	**Basic**			√ **Theory** **Lecture** **Lab** √ **Tutorial** **Practical** **Seminar**	
Module Code	**ETE-115-22-PM**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	**UGI**		**Semester of Delivery**		**1**
Administering Department	**Department of Electrical Engineering Techniques**		**College**	**Al-Furat Al-Awsat Technical University Polytechnic College - Karbala**	
Module Leader	**Reham Mueen Hatash**		**e-mail**	**reham.takleef.ikr27@atu.edu.iq**	
Module Leader's Acad. Title	**Assist. Lect.**		**Module Leader's Qualification**	**Master**	
Module Tutor	**None**		**e-mail**	**None**	
Peer Reviewer Name	**None**		**e-mail**	**None**	
Review Committee Approval	**13/10/2025**		**Version Number**		**1.0**

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	**To teach the students:** 1-Derivatives of trigonometric functions 2- Partial differentiation and Total differential 3- limit and derivative concepts 4- The Fundamental Theorem of Calculus,
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learning about the complex numbers. 2. Learning the Functions of several variables. 3. Learning the Lines and planes in space, Tangent and normal in the plane
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: ❖ Complex Numbers– For most students the assumptions I've made above about their exposure to complex numbers is the extent of their exposure. Problems tend to arise however because most instructors seem to assume that either students will see beyond this exposure in some later class or have already seen beyond this in some earlier class. Students are then suddenly expected to know more than basic arithmetic of complex numbers but often haven't actually seen it anywhere and have to quickly pick it up on their own in order to survive in the class. [13 hrs] ❖ Revision problem classes [6 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in exercises, while improving and expanding their mathematical reasoning skills.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.46
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	3,6 ,9, 11	LO #1, 2, and 4
	Assignments	2	10% (10)	Continuous	All

	Projects / Lab.	0	0		
	Report	0	0		
Summative assessment	**Midterm Exam**	2 hr	20% (20)	8	LO # 1-6
	Final Exam	3 hr	60% (60)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Equation of the straight line, Trigonometric functions and their sketches. Domain, Range, Inverse of functions, Absolute value, limits, Limits applications, Polar coordinates, Conic sections**
Week 2	**Differential calculus: Methods of differentiation, Some applications of differentiation**
Week 3	**Derivatives of trigonometric functions, inverse trigonometric**
Week 4	**Derivatives of Logarithmic and exponential functions**
Week 5	**Methods of differentiation, Some applications of differentiation. Rates of change, Velocity and acceleration Differentiation of parametric equations, implicit functions**
Week 6	**Partial differentiation, Total differential, rates of change and small changes Maxima, minima and saddle points for functions of two variables**
Week 7	**Hyperbolic functions, Relation between the hyperbolic functions and exponential functions**
Week 8	**Derivative of hyperbolic functions**
Week 9,10	**Differentiation II (maxima, minima and points of inflection; curve sketching; parametric, implicit and logarithmic differentiation; Maclaurin's series; Taylor's series)**
Week 11,12	**Theory of matrices and determinants. Properties of matrix operations, matrix transpose, matrix inverse, Applications to linear equations, Cramer's Rule. Eigen values and eigenvectors**
Week 13,14	**Complex Numbers & Applications: Argand's Diagram, De'Moivre's theorem and its application to find roots of algebraic equations. Hyperbolic Functions, Inverse Hyperbolic Functions, Logarithm of Complex Numbers, Separation into Real and Imaginary parts, Application to problems in Engineering.**
Week 15	**Final exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	**Advance Engineering Mathematics, Alan Jeffrey, 2002**	Yes
Recommended Texts	**Calculus II &Calculus III, Paul Dawkins, 2007**	No
Websites	https://tutorial.math.lamar.edu/Classes/CalcIII/CalcIII.aspx https://tutorial.math.lamar.edu/Classes/CalcII/CalcII.aspx	

APPENDIX:

GRADING SCHEME

مخطط الدرجات

Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** – Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors

	C – Good	جيد	70 – 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Description of the materials for the second course - first stage

Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**Instruments and Measurements**	**Module Delivery**	
Module Type	**Core**	√ **Theory**	
Module Code	**ETE-123-22-PM**	**Lecture**	
ECTS Credits	**5**	√ **Lab**	
SWL (hr/sem)	**125**	**Tutorial**	
		Practical	
		Seminar	

Module Level	**UGI**	**Semester of Delivery**	**2**
Administering Department	**Department of Electrical Engineering Techniques**	**College**	**Al-Furat Al-Awsat Technical University Polytechnic College - Karbala**
Module Leader	**Saif Saad Hussien**	**e-mail**	**saif.saad@atu.edu.iq**
Module Leader's Acad. Title	**Assist. Lect.**	**Module Leader's Qualification**	**Master**
Module Tutor	**None**	**e-mail**	**None**
Peer Reviewer Name	**None**	**e-mail**	**None**
Scientific Committee Approval Date	**13/10/2025**	**Version Number**	**1**

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. This course deals with define Measurement. 2. Knowledge of measurement errors, their types, their effect on measurements, and how to reduce their effect on measurements. 3. Introduce the Units and standard SI system.

	4. Knowledge the Classification of Instruments. 5. Various Measurements, method for determining resistance, inductance and capacitance. 6. Know the system measurement. 7. High voltage measurements and testing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 9. Develop the knowledge of theoretical and mathematical principles of electrical measuring instruments. 10. Have knowledge and critical understanding of the well-established principles underpinning measurement. 11. Have knowledge and critical understanding of the well-established principles of measurement and instrument design. 12. Have an understanding of measurement's errors. 13. Understand the role of various factors in calibration. 14. Choose the proper type and specification of measuring procedure and measuring instruments for different plication. 15. Have an understanding of Statistical analysis. 16. Understand the working of various potentiometers, instruments for measurement of R, L and C. 17. Understand the high voltage measurements principles and method of works.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Fundamentals of Electronic Measurements and Instrumentation D.C circuits, Current and voltage definitions, circuit elements, Combining resistive elements in series and parallel Ohm's law. Resistive networks, voltage and current sources, Thevenin equivalent circuits, current and voltage division, Capacitance and inductance RL, RC and RLC circuits Part B - Measurements Fundamental definitions, Measurements units, error of Measurements, Statistical analysis, D.c. measurement instrument. Ohmmeter as measurement instrument, Alternating - current indicating instruments, Electrodynamometer and application. Bridges, applications of D.c. Bridges, applications of A.c Bridges. Oscilloscope. High voltage measurement and its applications in electrical engineering techniques.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	4,10	LO #1#4, #5#9
	Assignments	8	10% (10)	3,12	LO #3, #8
	Projects / Lab.	7	10% (10)	Continuous	All
	Report	9	10% (10)	All	All
Summative assessment	**Midterm Exam**	1hr	20% (20)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Measurements and error.
Week 2	Statistical analysis.
Week 3	Units and standard SI system.
Week 4	Analogue instruments.
Week 5	D.c Ammeter. D.c Voltmeter.
Week 6	Series Type ohmmeter.
Week 7	Electrodynamic meters – wattmeters
Week 8	The cathode ray oscilloscope.
Week 9	D.C. Bridges & their applications.
Week 10	A.C. Bridges & their applications.
Week 11	Measurements of frequency, power angle, and power factor.
Week 12	D.C. High voltage measurements.

Week 13	A.C. High voltage measurements.
Weeks 14	Measurement's system.
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	INTRODUCTION TO LAB EQUIPMENT.
Week 2	AMMETER DESIGN.
Week 3	VOLTMETER DESIGN.
Week 4	LOADING EFFECT ON VOLTMETER.
Week 5	OHMMETER DESIGN.
Week 6	MEASUREMENT OF RESISTANCE USING WHEATSTONE BRIDGE.
Week 7	INDUCTANCE COMPARISON BRIDGE.
Week 8	CAPACITANCE COMPARISON BRIDGE.
Week 9	MAXWEEL BRIDGE.
Week 10	HAY BRIDGE.
Week 11	SCHERING BRIDGE.
Week 12	WIEN BRIDGE.
Week 13	OSCILLOSCOPE AND MEASUREMENT OF FREQUENCY.
Week 14	OSCILLOSCOPE AND MEASUREMENT OF PHASE ANGLE.
Week 15	Review

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Electronic instrumentation and measurement techniques, William David Cooper,	Yes
Recommended Texts	Electronic Instrumentation and Measurements, Third Edition, David A. Bell	No
Websites	https://www.abebooks.co.uk/book-search/title/electronic-instrumentation-and-measurements/	

Grading Scheme

مخطط الدرجات

Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors

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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Ministry of Higher Education and
Scientific Research – Iraq
Al-Furat Al-Awsat Technical University
Polytechnic College - Karbala
Department of Electrical Techniques Engineering

Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	**Arabic Language I**	**Module Delivery**
Module Type	**Suplement**	√ **Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**
Module Code	**ATU11**	
ECTS Credits	**2**	
SWL (hr/sem)	**50**	

Module Level	**UGI**	**Semester of Delivery**	**2**
Administering Department	**Department of Electrical Engineering Techniques**	**College**	**Al-Furat Al-Awsat Technical University Polytechnic College - Karbala**
Module Leader	**Athmar Hamza Turki**	**e-mail**	**Athmar.turki.ik4@atu.edu.iq**
Module Leader's Acad. Title	**Assist. Lect.**	**Module Leader's Qualification**	**Master**
Module Tutor	**None**	**e-mail**	**None**
Peer Reviewer Name	**None**	**e-mail**	**None**
Review Committee Approval	**13/10/2025**	**Version Number**	**1.0**

Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	ينشأ الطالب على حب اللّغة العربيّة لغة القرآن الكريم. التعرّف على مواطن الجمال في اللّغة العربيّة وآدابها، وأن يكتسب الطالب القدرة على دراسة فروع اللّغة العربيّة. تعريف الطالب بألفاظ اللّغة العربيّة الصحيحة وتراكيبها وأساليبها السليمة بطريقة مشوقة وجذابة. أن يستغل الطالب وقت فراغه بالقراءة والاطلاع والرجوع إلى المكتبة . تمكين الطالب من القراءة الصحيحة، وأن يكتسب القدرة على استعمال اللغة استعمالاً صحيحاً في الاتّصال مع الآخرين؛ كالسرعة وجودة الإلقاء وحسن التعبير، وتعويده حسن الاستماع لما يسمع مما ييسّر له أموره ويعينه على قضاء حوائجه. تنمية الذوق الأدبي لدى الطالب حتى يدرك النواحي الجمالية في أساليب الكلام ومعانيه وصوره. تعويد الطالب التعبيرات السليمة الواضحة عن أفكاره وما يقع تحت حواسه نطقاً وكتابة وحسن استخدام علامات الترقيم. تنمية قدرة ومهارة الطالب الإملائية والخطية بحيث يستطيع الكتابة الصحيحة من جميع النواحي. إيقاظ وعي الطالب لإدراك شرف الكلمة وتوجيهه؛ للمحافظة على طهارتها ونقائها حتى لا تستعمل إلا في الخير. مساعدة الطالب على فهم التراكيب المعقدة والأساليب الغامضة .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. معرفة القواعد النحوية والصرفية. 2- التعريف بأبرز المصنفات اللغوية والأدبية. 3- تحديد المشكلات اللغوية والأدبية لدى الدارسين. 4- القراءة المعاصرة للنصوص اللغوية والأدبية. 5- قراءة النصوص الأدبية وكتابتها وفق المعايير النحوية والصرفية 6- تعزيز الثقة بالنفس والجرأة والفصاحة 7- المنافسة والتميز في سوق العمل.
Indicative Contents المحتويات الإرشادية	1- مقدمة عن الأخطاء اللغوية التاء المربوطة والتاء المفتوحة (4 ساعات) 2- تطبيقات الأخطاء اللغوية الشائعة واقسام الكلام (6 ساعات) 3- همزة الوصل والقطع والهمزة المتوسطة والمتطرفة قواعد كتابة الالف الممدودة والمقصورة الحروف الشمسية والقمرية والضاد والظاء (12 ساعة) 4- المشاكل والمعوقات ونقاشات (6 ساعات)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1- .تبسيط المعلومات وتنظيمها 2- .تسهيل عملية استرجاع المعلومات

3- ربط المفاهيم الجديدة بالمكتسبات السابقة 4- .إيجاد العلاقة بين المفاهيم 5 - تسهيل تذكر المعارف والمعلومات	

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Continuous		All			
Formative assessment	**Quizzes**	3	10% (10)	5, 10	LO #1, 4 and 7
	Assignments	3	10% (10)	Continuous	All
	Projects / Lab.	2	10% (10)	Continuous	All
	seminar	2	10% (10)	3,8	LO,#1,2 ,#4and #5
Summative assessment	**Midterm Exam**	1 hr	10% (20)	7	LO # 1-7
	Final Exam	3 hr	50% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	**من سورة البقرة الآيات (260-263)** من سورة الحج الآيات (**1–5**)
Week 2	**مهارات لغوية :همزة الوصل والقطع**
Week 3	**مهارات لغوية : الهمزة المتوسطة والمتطرفة**
Week 4	**الصرف: الميزان الصرفي + الجموع في اللغة العربية**
Week 5	**الصرف : تصريف الافعال + الصحة والاعتلال + التجرد والزيادة**
Week 6	**المعاجم العربية : المدارس المعجمية + معاني الالفاظ الغريبة في القران الكريم**
Week 7	**المعاجم العربية : منهج مدرستي (العين والاساس) + من الاخطاء اللغوية الشائعة**
Week 8	**مهارات لغوية : علامات الترقيم + الحروف الشمسية والقمرية**
Week 9	**الادب**

Week 10	**النحو : اقسام الكلام + الافعال من حيث البناء والاعراب**
Week 11	**النحو : النواسخ**
Week 12	**النحو: المعرب والمبنى + المبتدأ والخبر**
Week 13	**النحو : المعرفة والنكرة + الفاعل والنائب عنه**
Week 14	**البلاغة : مقدمة في البلاغة العربية + تعريفها لغة واصطلاحاً + بيان علاقتها باللغة العربية**
Week 15	**البلاغة: علم البيان + التشبيه + الحقيقة والمجاز + الكناية**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	القران الكريم الاملاء الواضح, عبد المجيد النعيمي, مكتبة دار المتنبي بغداد ,ط6 - .الصرف الواضح, عباس حسن, دار المعارف, القاهرة ,2001 ,في الادب العربي الحديث , احسان عباس, دار الشروق عمان المعجم الوسيط, مجمع اللغة العربية بالقاهرة,2004 دروس البلاغة, وزارة التربية والتعليم, مصر , العراق, مطبعة التعليم	Yes
Recommended Texts	أخطاء لغوية شائعة لخالد بن هلال بن ناصر العبري همع الهوامع في شرح جمع الجوامع .المعجم العربي الاساسي شرح ابن عقيل على الفية ابن مالك, محمد محي الدين عبد الحميد	
Websites	https://www.eshamel.ne https://www.ektebsa7.com	

APPENDIX:

GRADING SCHEME

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A** – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Ministry of Higher Education and Scientific Research – Iraq
Al-Furat Al-Awsat Technical University
Polytechnic College - Karbala
Department of Electrical Techniques Engineering

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Engineering Workshops**	**Module Delivery**	
Module Type	**Basic**	**Theory** **Lecture** **√ Lab** **Tutorial** **Practical** **Seminar**	
Module Code	**ETE-125-22-PM**		
ECTS Credits	**4**		
SWL (hr/sem)	**100**		
Module Level	**UGI**	**Semester of Delivery**	**2**
Administering Department	**Department of Electrical Engineering Techniques**	**College**	**Al-Furat Al-Awsat Technical University / Polytechnic College – Karbala**
Module Leader	**Fatima Kadhim Abd**	**e-mail**	**fatima.abd@atu.edu.iq**
Module Leader's Acad. Title	**Assist. Lect.**	**Module Leader's Qualification**	**Bachelor**
Module Tutor	**None**	**e-mail**	**None**
Peer Reviewer Name	**None**	**e-mail**	**None**
Scientific Committee Approval Date	**13/10/2025**	**Version Number**	**1.0**

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Students will learn occupational safety in workshops and how to acts in the event of an electric shock. 2. Student will learn types of electrical conductors and methods of electrical installation. 3. Student will learn how use the contactor in some practical application. 4. Studying types of capacitors, inductances, semicondctors.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Principles of industrial security and occupational safety within the electricity workshops. 2. Dimensional measuring devices (MICROMETER). 3. characteristics of good installations, Types of electrical installations. 4. Practical electrical installation. 5. What is the electric coils, The different types of capacitor 6. Examine the types of semiconductors. 7. Instruct the student on how to design electronic circuits.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Occupational Safety Learn about safety principles in electrical shops and how to act when a shock occurs.[6hr] Part B – Tools Learn about tools used in workshops and how to use a micrometer to measure the diameter of conductors.[6hr] Part-C- Electrical installations[18hr] Methods of electrical installations and how to connect the contactors Part-D-Electronics:[15hr] Types of capacitors , semiconductors (Diodes, transistors), Electronic circuits.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1- Understanding: Occupational safety, methods of installations. 2-Practical experience: Installation, micrometers, electronic circuits.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.46
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	10% (10)	5 and 10	LO #1, #2 and7
	Assignments	4	10% (10)	2,5,8 and 12	LO #3, #4 and #6
	Seminars	2	10% (10)	Continuous	All
	Report	8	10% (10)	2 – 12	LO #3, #4 and #6, #7
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Principles of industrial safety and occupational health, general safety rules, and protection methods against electric shock in electrical workshops.
Week 2	Lab 2: Introduction to the tools and equipment used in electrical workshops.
Week 3	Lab 3: Dimensional measuring devices – the micrometer (MICROMETER).
Week 4	Lab 4: Electrical wiring systems – types of wiring, connection systems, the Bus-Bar, and how to supply houses with electricity.
Week 5	Lab 5: Characteristics of good electrical wiring.
Week 6	Lab 6: Practical application – connecting a single lamp with one control switch, and connecting two lamps in series.
Week 7	Lab 7: Practical application – connecting two lamps in parallel, controlling them with two-way switches, and the staircase lamp circuit.
Week 8	Lab 8: Lamp control methods using a contactor – its working principle and construction.
Week 9	Lab 9: Using a contactor to operate a three-phase motor
Week 10	Lab 10: Types of fuses used in electrical circuits and the current rating of each type
Week 11	Lab 11: The electrical coil – how it works and its different types.

Week 12	Lab 12: Types of electrical switches, followed by a practical application of connecting an intermediate (three-way) switch..
Week 13	Lab 13: Practical application – connecting an energy meter with a simple load
Week 14	Lab 14: Operating a three-phase motor using an air sensor (contactor).
Week 15	Lab 15: General review.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		Yes
Recommended Texts		No
Websites	https://uotechnology.edu.iq/training/units/kahrabaa/kahrabaminhaj/minhaj1.html http	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**Computer I**	**Module Delivery**	
Module Type	**Suplement**	√ **Theory** **Lecture** √ **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	**ATU12**		
ECTS Credits	**3**		
SWL (hr/sem)	**75**		
Module Level	**UGI**	**Semester of Delivery**	**2**
Administering Department	**Department of Electrical Engineering Techniques**	**College**	**Al-Furat Al-Awsat Technical University Polytechnic College - Karbala**
Module Leader	**Ali Akbar Khaleel Mahmood**	**e-mail**	**Ali.mahmood@atu.edu.iq**
Module Leader's Acad. Title	**Assist. Lect.**	**Module Leader's Qualification**	**Master**
Module Tutor	**None**	**e-mail**	**None**
Peer Reviewer Name	**None**	**e-mail**	**None**
Review Committee Approval	**13/10/2025**	**Version Number**	**1.0**

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1-Understanding the Fundamentals: The primary objective of a computer principal course is to provide students with a solid foundation in the fundamental principles of computer work. This includes concepts such as Hardware, Software and new technologies in computer area. 2-Analyzing the work of Components: Students will learn how does computer parts work and the parts of each of them. They will understand their behavior in normal condtion and be able to calculate their effects on the overall performance of work. 3-Computer Specifications: Students will become familiar with important properties of each computer components and be able to install the proper hardware/software for their computer. 4-Laboratory Skills: The course includes hands-on laboratory experiments to provide students with practical experience of using Microsoft Office progmars suck as Word, PowerPoint, Excel and Access.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Fundamental Knowledge: Students will acquire a solid understanding of the fundamental concepts and principles of computer hardware components, including CPU, RAM, Storage Devices, Input and output devices. 2-Copmputer performance Skills: Students will be able to buy their own PC/Laptop in a manner that allow to use the full capability of the computer with less price. 3-Computer Software Skill: Students will be able to install computer drivers and the

	essential programs. 4-Through hands-on laboratory experiments, students will be able to write reports, homework and posters by using Word program, on the other hand they will be able to prepare presentations using PowerPoints program. Also, they will be able to use Excel and Access programs to solve equations and draw curves.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – Introduction to Computer. Constituent the field of using computer, types of computers and their differences, The advantages and disadvantages of computers [8 hrs] • Part B Computer Components. CPU, RAM, Storage Devices, Input and Output devices [14 hrs] • Part C Office programs . Microsoft Word, Microsoft PowerPoint, Microsoft Excel and Microsoft Access. [32 hrs] • Revision problem classes [6 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1-**Hands-on Experiments:** Engage students in practical experiments to deepen their understanding of circuits. 2-**Videos:** seeing videos for best understanding of components work. 3-**Group Reports:** Assign collaborative reports for new computer technology. 4-**Interactive Discussions:** Encourage student participation and critical thinking through open-ended questions. 5-**Assessment Variety:** Use diverse assessment methods to gauge student understanding. 6-**Office Hours and Support:** Offer individualized assistance through office hours or online support.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	10% (10)	3,7, 10	LO #1, 2, 4
	Assignments	4	10% (10)	3, 5,9,12	LO # 3, 4
	Projects / Lab.	1	10% (10)	7	Lo#2,3,4
	Report	4	10% (10)	2, 5, ,10, 12	CONTINOUI

					S
Summative assessment	**Midterm Exam**	2 hr	10% (10)	10	LO # 1-3
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
1	Introduction to computer
2	Hardware and Software
3	Central Processing Unit
4	Memory
5	Storage Devices
6	Motherboard
7	Operating System
8	Windows Desktop
9	Installing and removing programs
10	Utility programs
11	Internet
12	Cloud services
13	Artificial Intelligence Websites and Programs
14	Smart Websites
15	Final Examination

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
1	**Lab 1: Introduction to Microsoft Office Program**
2	**Lab 2: File and Home tabs in Microsoft Word**
3	**Lab 3: Insert tab in Microsoft Word**
4	**Lab 4: Desing and Layout tabs in Microsoft Word**
5	**Lab 5: Home and Insert tab in Microsoft PowerPoint**
6	**Lab 6: Transitions tab in Microsoft PowerPoint**
7	**Lab 7: Animations tab in Microsoft PowerPoint**
8	**Lab 8: Home tab in Microsoft Excel**
9	**Lab 9: Insert tab in Microsoft Excel**
10	**Lab 10: Writing formulas in Microsoft Excel**
11	**Lab 11: Creating tables in Microsoft Access**
12	**Lab 12: Creating forms in Microsoft Access**
13	**Lab 13: Creating reports in Microsoft Access**
14	**Lab 14: Review**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of Computer Work	Yes
Recommended Texts	Fundamentals of Computer Work	No
Websites	Youtube	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

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Al-Furat Al-Awsat Technical University
Polytechnic College - Karbala
Department of Electrical Techniques Engineering

Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**AC Electrical Circuits**	**Module Delivery**	
Module Type	**Core**	√ **Theory**	
Module Code	**ETE-121-22-PM**	**Lecture**	
ECTS Credits	**6**	√ **Lab**	
SWL (hr/sem)	**150**	**Tutorial**	
		Practical	
		Seminar	
Module Level	**UGI**	**Semester of Delivery**	**2**
Administering Department	**Department of Electrical Engineering Techniques**	**College**	**Al-Furat Al-Awsat Technical University Polytechnic College - Karbala**
Module Leader	**Hiba Yasin Theban**	**e-mail**	**hiba.theban@atu.edu.iq**
Module Leader's Acad. Title	**Assist. Lect.**	**Module Leader's Qualification**	**Master**
Module Tutor	**None**	**e-mail**	**None**
Peer Reviewer Name	**None**	**e-mail**	**None**
Review Committee Approval	**13/10/2025**	**Version Number**	**1.0**

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1-Understand the fundamental concepts and principles of alternating current (AC) circuits. 2-Gain knowledge of the mathematical tools and techniques used to analyze AC circuits, including phasors, complex numbers, and impedance. 3-Develop the ability to solve AC circuit problems using circuit analysis techniques such as mesh analysis, nodal analysis, and Thevenin's theorem.. ect. 4-Learn how to calculate and analyze voltage and current phasors in AC circuits, including their amplitudes, phases, and frequency relationships. 5-Explore the behavior and characteristics of AC circuit elements, such as resistors, capacitors, and inductors, and understand their roles in AC circuit analysis. 6-Investigate the concept of impedance in AC circuits and its relationship to resistance, reactance, and frequency. 7-Study the principles of AC power and power factor, including real power, reactive power, apparent power, and power factor correction. 8- Gain a comprehensive understanding of three-phase AC systems, including the generation, transmission, and distribution of power in three-phase circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Knowledge Acquisition: Students will acquire a comprehensive understanding of the fundamental concepts and principles of alternating current (AC) circuits. 2-Circuit Design and Analysis: Students will gain the ability to design and analyze AC circuits, applying their knowledge of impedance, power factor, and component characteristics. They will learn to calculate voltage and current magnitudes, phase differences, and power relationships in AC circuits. 3-Phasor Diagram Interpretation: Students will be able to construct and interpret phasor diagrams to visualize and analyze the behavior of voltages and currents in AC circuits. 4-Three-Phase Systems: Students will acquire understanding of three-phase AC systems, including balanced and unbalanced configurations. Laboratory Skills: Students will develop practical skills in using circuit simulation software and laboratory equipment to design, analyze, and verify the performance of AC circuits.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – Inductance & Capacitance in Electric circuits. **General concept of capacitance (charge and voltage, capacitors in series and parallel)** General concept of inductance (inductive and non-inductive circuits, capacitors in series and parallel) [4 hrs] • Part B Alternating Quantities. Ac systems, waveforms, terms and definitions. Average and R.M.S values of

	current and voltage. [8 hrs] • Part C Single - phase of AC Circuits. AC in resistive circuits, current and voltage in inductive circuits, current and voltage in capacitive circuits. Concept of complex impedance and admittance, AC series and parallel circuits. RL, RC and RLC circuit analysis and phasor representation. [14 hrs] • Part D Power in AC circuits. Power in resistive circuits. power in inductive and capacitive circuits ,power in circuit with resistance and reactance. Power factor, its practical importance, improvement of power factor, measurement of power in a single – phase AC circuits. [8 hrs] • Part E Three – phase circuit analysis. Basic concept and advantages of three – phase circuit. Phasor representation of star and delta connection. Phase and line quantities. Voltage and current computation in 3-phase balance and unbalance circuits. Real and Reactive power computation, measurement of power and power factor in 3-phase system. [20 hrs] • Revision problem classes [6 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1-Conceptual Understanding: Explain the differences between AC and DC circuits, introduce the concept of impedance, reactance, and phasors, and highlight the significance of frequency and phase in AC circuits. 2-Mathematical Foundations: Provide a solid mathematical foundation for AC circuits. Teach students the use of complex numbers and phasor notation to analyze AC circuits. 3-Problem-Solving Skills: Dedicate adequate time to problem-solving exercises and examples. 4-Laboratory Experiments: Incorporate laboratory experiments to reinforce theoretical concepts. Allow students to build and analyze AC circuits using oscilloscopes, function generators, and AC power sources. 5-Simulation Tools: Introduce simulation software tools that allow students to simulate AC circuits and observe their behavior. 6-Review and Assessment: Regularly review key concepts and provide formative assessments to gauge students' understanding. Offer constructive feedback on their performance to help them identify areas for improvement.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	10% (10)	4,5, 10,12	1,2, 4
	Assignments	5	10% (10)	Continuous	ALL
	Projects / Lab.	2	10% (10)	3,8	All
	Report	8	10% (10)	Continuous	All
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-4
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
1,2,3,4,5,6	AC circuits with steady-state sinusoidal excitation: Basic concepts of frequency, angular frequency, phase shift, amplitude, peak, peak-to-peak, and root-mean-square values. Mathematical representation of sinusoidal voltages and currents, phasor representation of alternating voltages and currents, complex number representation of voltage and current phasors, the j operator and its application in circuit analysis. Complex impedance, admittance, resistance, reactance, conductance and susceptance. Solution of simple circuits by combining impedances in series and parallel. General circuit analysis using j notation. Resonance: **Analysis and applications of series and parallel resonant circuits, bandwidth and Q factor.**
7,8,9	**AC power absorbed by a resistor, inductor and capacitor. Relationships between power, reactive power and VA, power factor, principle of conservation of power and reactive power, reactive power absorbed by capacitors and inductors, power factor correction, complex power in terms of phasor voltages and currents.**
10,11	Poly phase and three phase system , Delta connection, Wye connection.
12,13	The power in balance phase circuit. **Unbalance Wye and delta connected load, the rotating magnetic field.**
14	**Magnetically coupled circuits.**
15	**Final Examination**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
1	**Lab.1:Operating of oscilloscope (CRO)**
2	**Lab.2:Utilization of oscilloscope for measuring voltage (The Sine wave)and calculate average, RMS value and time period.**

3	**Lab.3: Alternating voltage applied in a pure resistance circuit.**
4	**Lab.4: Alternating voltage applied in a pure inductive circuit.**
5	**Lab.5: Alternating voltage applied in a pure capacitive circuit.**
6	**Lab.6: Series R-L circuit**
7	**Lab.7: Series R-C circuit**
8	**Lab.8: Series R-L-c circuit**
9	**Lab.9: Parallel R-L circuit**
10	**Lab.10: Parallel R-C circuit**
11	**Lab.11: Parallel R-L-C circuit**
12	**Lab.12: Balanced 3-phase circuit star connection**
13	**Lab.13: Balanced 3-phase circuit delta connection.**
14	**Lab.14: Unbalanced 3-phase circuit star connection**
15	**Lab.15: review**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Charles K. Alexander, Matthew N.O. Sdiku Fundamentals of Electrical Engineering, 4th Edition, 2009	Yes
Recommended Texts	Tony R. Kuphaldt, Lessons In Electric Circuits, Volume II - AC 5th edition, 2002	No
Websites	AC circuits https://byjus.com/physics/ac-circuit/	

APPENDIX:

GRADING SCHEME

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Ministry of Higher Education and
Scientific Research – Iraq
Al-Furat Al-Awsat Technical University
Polytechnic College - Karbala
Department of Electrical Techniques Engineering

Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	**Electronic Circuits**	**Module Delivery**
Module Type	**Core**	√ **Theory** **Lecture** √ **Lab**
Module Code	**ETE-122-22-PM**	

ECTS Credits	**6**			**Tutorial** **Practical** **Seminar**	
SWL (hr/sem)	**150**				
Module Level	**UGI**		**Semester of Delivery**		**2**
Administering Department	**Department of Electrical Engineering Techniques**		**College**	**Al-Furat Al-Awsat Technical University** **Polytechnic College - Karbala**	
Module Leader	**Karrar Ali Kzar**		**e-mail**	**karrar.simawi@atu.edu.iq**	
Module Leader's Acad. Title	**Assist. Lect.**		**Module Leader's Qualification**		**Master**
Module Tutor	**None**		**e-mail**	**None**	
Peer Reviewer Name	**None**		**e-mail**	**None**	
Review Committee Approval	**13/10/2025**		**Version Number**		**1.0**

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1- Understanding the Basics: The primary objective of the Electronic Basic course is to provide students with a solid foundation in the basic principles BJT , FET transistor and thyristor 2-Analyzing Circuit Components: Students will understand how transistors, and thyristors are formed, as well as understanding and analyzing the electronic circuits in which the transistors and thyrestors are included, like as biasing circuit, comparator circuits , amplifier circuits. 3-Circuit Laws and Theorems: Students will become familiar with important laws and theorems governing the transistor applications circuits. They will gain proficiency in applying these principles to solve complex circuit problems. 4-Circuit Simulation and Design: The course may involve introducing students to circuit simulation software. They will learn how to use simulation tools to analyze and design the electronic circuits, verify their calculations, and gain practical insights into circuit behavior. 5-Problem-Solving Skills: An important objective is to develop students' problem-solving skills in the context of electronic circuits. They will learn how to analyze circuit diagrams, formulate appropriate strategies, and apply their knowledge to solve a variety of circuit problems efficiently. 6-Laboratory Skills: The course includes hands-on laboratory experiments to provide students with practical experience in building, testing, and troubleshooting electronic circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Fundamental Knowledge: Students will acquire a solid understanding of the fundamental concepts and principles of electronic circuits that's contain thyristor and transistor. 2-Circuit Analysis Skills: Students will develop the ability to analyze electronic circuits such as biasing circuits , comparator circuits , amplifier circuits 3-Circuit Design and Simulation: Students will be able to design and simulate electronic circuits, using appropriate components and considering design constraints. They will learn to use circuit simulation software to verify their designs, analyze circuit performance, and troubleshoot circuit issues. 4-Laboratory Skills: Through hands-on laboratory experiments, students will

	develop practical skills in building, testing, and troubleshooting electronic circuits. They will become proficient in using measuring instruments, interpreting experimental data, and ensuring safety precautions while working with electrical circuits. 5-Critical Thinking and Analysis: The course will promote critical thinking and analytical skills among students. They will learn to evaluate different circuit solutions, analyze circuit behavior, and make informed decisions based on their understanding of electronic circuits. By the end of the course, students will possess a comprehensive knowledge of electronic circuits, enabling them to analyze, design, and troubleshoot a wide range of electrical circuits. They will be prepared for further studies in electrical engineering or related fields and equipped with skills that can be applied in professional practice.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Part A – transistor biasing. DC biasing of BJT transistor and Q-point, Voltage-devider Bias , Emitter Bias, Base Bias, Emitter-Feedback Bias, Collector-Feedback Bias. [16 hrs] • Part B - amplifier circuits. Transistor as an amplifier, The Common-Emitter Amplifier, The Common-Collector Amplifier The Common-Base Amplifier Power Amplifier. [18 hrs] • Part C - Thyristor and Other semiconductor devices (Diac, Triac , SCR) Thyritor characteristic, the SCR circuit, the Triac circuit. And Diac circuit. [20 hrs] • Revision problem classes [6 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	1-**Hands-on Experiments:** Engage students in practical experiments to deepen their understanding of circuits. 2-**Simulation Software:** Use circuit simulation software for virtual circuit design and analysis. 3-**Problem-solving Exercises:** Include various problem-solving exercises to apply circuit analysis techniques. 4-**Group Projects:** Assign collaborative projects for circuit design and construction. 5-**Real-world Applications:** Discuss practical applications of circuits in different devices and systems. 5-**Interactive Discussions:** Encourage student participation and critical thinking through open-ended questions. 6-**Conceptual Understanding:** Focus on intuitive understanding alongside mathematical analysis. 7-**Assessment Variety:** Use diverse assessment methods to gauge student understanding. 8-**Office Hours and Support:** Offer individualized assistance through office hours or online support.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3- 10	LO #1, 2, 5
	Assignments	2	10% (10)	2-12	LO # 3, 4
	Projects / Lab.	4	10% (10)	Continuous	All
	Report	8	10% (10)	2, 12	LO # 5
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-5
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
1	DC biasing of BJT transistor and Q-point
2	**Voltage-devider Bias , Emitter Bias**
3	**Base Bias**
4	**Emitter-Feedback Bias**
5	**Collector-Feedback Bias**
6	**Transistor as an amplifier , Operation Amplifier**
7	**The Common-Emitter Amplifier**
8	**The Common-Collector Amplifier**
9	The Common-Base Amplifier
10	**Power Amplifier**
11	Thyristor
12,13	Other semiconductor devices (Diac, Triac , SCR)
14	SCR applications
15	Final examination

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
1	**Lab 1: FET characteristcs**
2	**Lab 2: Small signal Amplifier**
3	**Lab 3: Transistor Voltage-devider Biasing**
4	**Lab 4: Transistor Emitter Biasing**
5	**Lab 5: Transistor Base Biasing**
6	**Lab 6: Transistor Emitter-Feedback Biasing**
7	**Lab 7: Transistor Collector-Feedback Biasing**
8	**Lab 8: The Common Emitter Amplifier**

9	**Lab 9: The Common-Collector Amplifier**
10	**Lab 10: The Common-Base Amplifier**
11	**Lab 11: Thyristor and SCR characteristics**
12, 13	**Lab 12,13: Applying Multisim program to use it in electronic experiments**
14	**Lab 14: Review**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas L. Floyd "Electronic Devices Conventional Current Version"	Yes
Recommended Texts	Robert L. Boylestad , Louis Nashelsky "Electronic Devices and Circuit Theory"	No
Websites		

APPENDIX:

GRADING SCHEME

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A** – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Ministry of Higher Education and
Scientific Research – Iraq
Al-Furat Al-Awsat Technical University
Polytechnic College - Karbala
Department of Electrical Techniques Engineering

Module Descriptor Form
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Integral Mathematics**			**Module Delivery**	
Module Type	**Basic**			√ **Theory** **Lecture** **Lab** √ **Tutorial** **Practical** **Seminar**	
Module Code	**ETE-124-22-PM**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	**UGI**		**Semester of Delivery**		**2**
Administering Department	**Department of Electrical Engineering Techniques**		**College**	**Al-Furat Al-Awsat Technical University Polytechnic College - Karbala**	
Module Leader	**Reham Mueen Hatash**		**e-mail**	**reham.takleef.ikr27@atu.edu.iq**	
Module Leader's Acad. Title	**Assist. Lect.**		**Module Leader's Qualification**	**Master**	
Module Tutor	**None**		**e-mail**	**None**	
Peer Reviewer Name	**None**		**e-mail**	**None**	
Review Committee Approval	**13/10/2025**		**Version Number**		**1.0**

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	**To teach the students:** 1-Derivatives of trigonometric functions 2- Partial differentiation and Total differential 3- limit and derivative concepts 4- The Fundamental Theorem of Calculus, 5-Indefinite Integrals and the Net Change Theorem.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	4. Learning about the complex numbers. 5. Learning the Functions of several variables. 6. Learning the Lines and planes in space, Tangent and normal in the plane 7. Learning the Triple integrals in rectangular coordinates 8. Double Integral in rectangular and polar form, Areas and volumes 9. Applications (Surface Area, Green's theorem and Stokes' theorem
Indicative Contents	Indicative content includes the following: ❖ Complex Numbers– For most students the assumptions I've made above about

المحتويات الإرشادية	their exposure to complex numbers is the extent of their exposure. Problems tend to arise however because most instructors seem to assume that either students will see beyond this exposure in some later class or have already seen beyond this in some earlier class. Students are then suddenly expected to know more than basic arithmetic of complex numbers but often haven't actually seen it anywhere and have to quickly pick it up on their own in order to survive in the class. [13 hrs] ❖ Vector Fields – In this section we introduce the concept of a vector field and give several examples of graphing them. We also revisit the gradient that we first saw a few chapters ago. Line Integrals – Part I – In this section we will start off with a quick review of parameterizing curves. This is a skill that will be required in a great many of the line integrals we evaluate and so needs to be understood. We will then formally define the first kind of line integral we will be looking at : line integrals with respect to arc length. Line Integrals – Part II – In this section we will continue looking at line integrals and define the second kind of line integral we'll be looking at : line integrals with respect to x, y, and/or z. We also introduce an alternate form of notation for this kind of line integral that will be useful on occasion. Line Integrals of Vector Fields – In this section we will define the third type of line integrals we'll be looking at : line integrals of vector fields. We will also see that this particular kind of line integral is related to special cases of the line integrals with respect to x, y and z. [20 hrs] ❖ Part D: Multiple Integrals - In this chapter will be looking at double integrals, i.e. integrating functions of two variables in which the independent variables are from two dimensional regions, and triple integrals, i.e. integrating functions of three variables in which the independent variables are from three dimensional regions. Included will be double integrals in polar coordinates and triple integrals in cylindrical and spherical coordinates and more generally change in variables in double and triple integrals.[20 hrs] ❖ Revision problem classes [6 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in exercises, while improving and expanding their mathematical reasoning skills.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.46
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	3,6 ,9, 11	LO #1, 2, and 4
	Assignments	2	10% (10)	Continuous	All
	Projects / Lab.	0	0		
	Report	0	0		
Summative assessment	Midterm Exam	2 hr	20% (20)	8	LO # 1-6
	Final Exam	3 hr	60% (60)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Equation of the straight line, Trigonometric functions and their sketches. Domain, Range, Inverse of functions, Absolute value, limits, Limits applications, Polar coordinates, Conic sections
Week 2	Differential calculus: Methods of differentiation, Some applications of differentiation
Week 3	Derivatives of trigonometric functions, inverse trigonometric
Week 4	Partial differentiation, Total differential, rates of change and small changes Maxima, minima and saddle points for functions of two variables
Week 5	Theory of matrices and determinants. Properties of matrix operations, matrix transpose, matrix inverse, Applications to linear equations, Cramer's Rule. Eigen values and eigenvectors
Week 6	Derivatives of Logarithmic and exponential functions
Week 7	Hyperbolic functions, Relation between the hyperbolic functions and exponential functions
Week 8	Derivative of hyperbolic functions
Week 9	Sigma Notation, Areas and Distances, The Definite Integral. The Fundamental Theorem of Calculus, Indefinite Integrals and the Net Change Theorem, The Substitution Rule
Week 10	Trigonometric Integrals, Trigonometric Substitution, Partial Fractions and Improper Integrals
Week 11, 12	Integration using Tables and Computer Algebra Systems CAS, Numerical Integration (Trapezoidal Approximation, Midpoint Approximation, Simpson's Approximation, and Error Bounds)
Week 13	Areas between Curves, Volume, Volumes by Cylindrical Shells Average Value of a Function (Mean Value Theorem), Arc Length
Week 14	Applications to Physics and Engineering and Probability
Week 15	Final exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Advance Engineering Mathematics, Alan Jeffrey, 2002	Yes
Recommended Texts	Calculus II &Calculus III, Paul Dawkins, 2007	No
Websites	https://tutorial.math.lamar.edu/Classes/CalcIII/CalcIII.aspx https://tutorial.math.lamar.edu/Classes/CalcII/CalcII.aspx	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
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Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Course Description Form

1.Course Name:	
Power Electronics	
2.Course Code:	
KTED123	
3.Semester / Year:	
Year	
4.Description Preparation Date:	
17/12/2025	
5.Available Attendance Forms:	
Presence	
6.Number of Credit Hours (Total) / Number of Units (Total)	
150 urs (60 theoretical hours + 90 practical hours)	
7.Course administrator's name (mention all, if more than one name)	
Name: Haidar Fadl Abd Manhal Email: **hayder.manhel.ikr10@atu.edu.iq**	
8.Course Objectives	
This course aims to provide the trainee with the cognitive skills related to the elements of power electrons, their properties, how to operate them, and their uses in power circuits and electrical machines, such as controlled and uncontrolled unit circuits, direct current interrupters, alternating voltage governors, and inverters, in addition to how to use these circuits in the field of industry. One of the objectives of this course in the educational institutions attended by students is:	• Preparing the student to recognize electronic components manufactured from semiconductor materials. • Preparing the student to learn about the analysis of electronic circuits for power electronics systems. • Identify the applied circuits of power electronics systems. • Preparing human cadres who possess technical qualifications that enable them to enter the labor market efficiently. • Preparing qualified technical personnel to study and design electronic circuits as required by the labor market, build electrical circuits, control and control the operation and manufacture of electronic devices, and convert electrical energy from one type to another according to the required study. • The specialty aims to graduate competent personnel equipped with all electrical and electronic information enabling them to carry out maintenance work and

	operate electrical circuits based on electronic designs.

10. Course Evaluation
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

11. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	• Basic Circuits (A.M.F Brooks) Pergaman Press.
Main references (sources)	• Electrical Technology (Edward Hughes) • Introduction to Electric circuits (M. Romanwitz) John Willy • Basic Electrical Engineering (Fitzgerald & Rlgginborthan) Mc – Graw – Hill • Electrical Technology (Edward Huges) • Basic Electrical Engineering • Power electronics handbook, Third edition, Muhammad H. Rashid, Elsevier,2011 • Power Electronics Basics, YuriyRozanov, Sergey E. Ryvkin, EvgenyChaplygin, Pavel Voronin, CRC Press, 2015 • Introduction to Power Electronics, Paul H. Chappell, Artech House, 2014.
Recommended books and references (scientific journals, reports...)	• Advanced industrial electronics by morris • Thyristor engineering by B.B. berde
Electronic References, Websites	• Various Internet sources

12. Teaching and Learning Strategies:

- Theoretical lecture
- Practical lecture
- Discussion with students and students among themselves
- Preparing reports and projects related to the scientific material of the lecture
- Summer training in the private and public sectors
- E-Learning
- Using modern methods in teaching and training students
- Forming discussion circles during lectures to discuss study topics
- Assigning students to class duties

13. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Identify the basic components of power electronics circuits	Power electronic, electronic componts which used in high power control (power diodes, thyristor and power transistors) pevison of single-phase rectifier circuits by using diodes.	Lectures + Practical applications	Daily, monthly, and annual exams
2	5	Identify three-phase rectifier circuits	Three phase rectifier circuits by using diodes, output voltage waveform, diode current waveform, output voltage equation in case of resistance lode.	Lectures + Practical applications	Daily, monthly, and annual exams
3	5	Learn about the use of a transistor as a switch	Using the transistor as switch, regions of operation, transistor as a switch (cut off and saturation).	Lectures + Practical applications	Daily, monthly, and annual exams
4	5	Learn about improving the opening and closing of a transistor	Power transistor in (off)and (on) state, improvement of (off) and (on) time by using speed up capacitance,	Lectures + Practical	Daily, monthly, and annual

			practical problems.	applications	exams
5	5	Identify the bipolar transistor	Uniplolor junction transistor, construction, theoretical operation, using the transistor as relaxation oscillator practical example.	Lectures + Practical applications	Daily, monthly, and annual exams
6	5	Learn how to use an operational amplifier	operational amplifier, description of operational amplifier (op-amp) as asparate components, zero detector, comparator.	Lectures + Practical applications	Daily, monthly, and annual exams
7	5	Learn how to use an operational amplifier	The use of op-amp as actable multivibrator and a monostable multivibrator, photo conduction cells, photo diodes.	Lectures + Practical applications	Daily, monthly, and annual exams
8	5	Learn about the use of the LED electronic element	Light – emitting diodes (LED), photo transistors, the use of optical comparator in power electronic circuits.	Lectures + Practical applications	Daily, monthly, and annual exams
9	5	Learn about the use of thyristor properties	Thyristor, construction, characteristic, curves for a thyristor, thyristor conduction in forward biasing, thyristor family, thyristor representation as a double transistor circuit.	Lectures + Practical applications	Daily, monthly, and annual exams
10	5	Learn about ways to connect thyristors	Thyristor conduction methods, conduction throw the gate minimum gate current causing conduction, conduction time, conduction due to high forward voltage rectifier (dv/dt)	Lectures + Practical applications	Daily, monthly, and annual exams
11	5	Learn about Dayak and Trayak	DIAC, TRIAC characteristics, practical applications, thyristor, triggering methods, triggering on DC and AC current, pulse triggering types	Lectures + Practical applications	Daily, monthly, and annual exams

12	5	Learn about the methods of thyristor switching	thyristor triggering circuit, DC and AC triggering circuits.	Lectures + Practical applications	Daily, monthly, annual exams
13	5	Learn about mug pulse circuits	Pulse current triggering circuit, relaxation oscillator, zero detector, comparator with a stable and monostable multivibrators (operational amplifiers and timer).	Lectures + Practical applications	Daily, monthly, and annual exams
14	5	Learn about thyristor applications	Thyristor general application introductory, AC to DC inverter DC to AC inverter, DC to DC inverter, AC to AC inverter, phase controlled halfwave rectifier with resistance and indctormce load output current and voltage waveform , output voltage equations	Lectures + Practical applications	Daily, monthly, and annual exams
15	5	Identify the semi-controlled thyristor rectifier	Half controller full wave rectifier fully controlled, resistance and inductance load , generated wave forms, output voltage equation for free wheeling diode.	Lectures + Practical applications	Daily, monthly, and annual exams
16	5	Identify the fully controlled thyristor rectifier	Regenerating fully controlled inverters, examples, DC motor speed control.	Lectures + Practical applications	Daily, monthly, and annual exams
17	5	Identify the three-phase thyristor inverter	Three face inverters, output voltage wave form with, triggering pulses and equations.	Lectures + Practical applications	Daily, monthly, and annual exams

18	5	Identify thyristor protection circuits	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.	Lectures + Practical applications	Daily, monthly, and annual exams
19	5	Identify thyristor suppression circuits	DC to AC inverters methods of forcing the thyristor to get off.	Lectures + Practical applications	Daily, monthly, and annual exams
20	5	Identify series and parallel thyristor inverter circuits	Parallel and series inverter, single and three phase, control methods in charging frequency and voltage, output wave forms.	Lectures + Practical applications	Daily, monthly, and annual exams
21	5	Identify series and parallel thyristor inverter circuits	Inverter application, emergency power supply, single phase DC motor speed control.	Lectures + Practical applications	Daily, monthly, and annual exams
22	5	Learn about ways to control motors	Three phase motor control by using a constant ratio of variation frequency and voltage.	Lectures + Practical applications	Daily, monthly, and annual exams
23	5	Identify thyristor circuits	Choppers, DC to DC inverter frequency constant, line constant	Lectures + Practical applications	Daily, monthly, and annual exams
24	5	Identify the types of clips	Types of choppers, DC motor speed control.	Lectures + Practical applications	Daily, monthly, and annual exams

25	5	Learn about voltage regulators	AC to AC inverter, single phase voltage regulator, three phase voltage regulator	Lectures + Practical applications	Daily, monthly, and annual exams
26	5	Learn about methods of controlling single-phase and three-phase motors	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.	Lectures + Practical applications	Daily, monthly, and annual exams
27	5	Learn about frequency modulator circuits	Cyclic inverter, AC to DC cyclic inverter, DC to DC cyclic inverter.	Lectures + Practical applications	Daily, monthly, and annual exams
28	5	Identify circuits of inverters, structure diagrams	AC to AC cyclic inverter control block diagram.	Lectures + Practical applications	Daily, monthly, and annual exams
29	5	Learn about PWM	Using amplitude modulation for speed control.	Lectures + Practical applications	Daily, monthly, and annual exams
30	5	Identify the unipolar transistor	Using polar transistor for AC motor speed control .	Lectures + Practical applications	Daily, monthly, and annual exams

14. Course Evaluation
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

15. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	• Electrical Technology (Edward Hughes) • Basic Circuits (A.M.F Brooks) Pergaman Press. • Introduction to Electric circuits (M. Romanwitz) John Willy • Basic Electrical Engineering (Fitzgerald & Rlgginborthan) Mc – Graw – Hill • المصدر للمادة العملية • Electrical Technology (Edward Huges) • Basic Electrical Engineering • الكترونيات في خدمة التطبيقات الكهربائية ترجمة الدكتور سمير رستم • Power electronics handbook, Third edition, Muhammad H. Rashid, Elsevier,2011. • دليل المهندس والفني في العناصر الكهربائية والالكترونية، محمد قاسم، شعاع للنشر والعلوم، 2012. • Power Electronics Basics, YuriyRozanov, Sergey E. Ryvkin, EvgenyChaplygin, Pavel Voronin, CRC Press, 2015 • Introduction to Power Electronics, Paul H. Chappell, Artech House, 2014.
Recommended books and references (scientific journals, reports...)	• مشروع كتاب الدوائر والقياسات • مبادئ علم الهندسة الكهربائية / دكتور محمد زكي – دكتور مظفر النعمة • ملزمة الدوائر والقياسات العملي • Advanced industrial electronics by morris • Thyristor engineering by B.B. berde الكترونيات القدرة (تأليف الدكتور مظفر أنور النعمة)
Electronic References, Websites	• Various Internet sources

Course Description Form

1. Course Name **:**
English language (2)
2. Course Code:
KTED130
3. Semester / Year:
Second II
4. Description Preparation Date:
17/12/2025
5. Available Attendance Forms:
Actual attendance
6. Number of Credit Hours (Total) / Number of Units (Total):
60 hour/annually - 2 units
7. Course administrator's name:
Name: HUSSEIN HAMID NEAMAH ; Email: hussein.neamah@atu.edu.iq
8. Course Objectives
To make students able to speak English (listening, speaking, reading and writing).The activities within New Headway Pre- Intermediate are designed to enable pre-intermediate students to extend their knowledge of the language and to allow them to activate what they have learnt. There is also an emphasis on increasing fluency, so that students feel able to actively participate in conversations and discussions. We hope that students will enjoy using the course and that it will give them a real sense of progression in their language learning.
9. Teaching and Learning Strategies
Using Headway will help students listen, speak, read, and write correctly using the English language. It

also helps students by watching attached video clips of films or plays so that they can discuss them after watching. New Headway Pre-Intermediate, Fourth edition is a course for students who already have a solid foundation in the language. They may have recently completed an elementary course or they may be returning to language learning after a break and need to revise key language before being able to progress further. New language is introduced systematically, allowing students to extend and consolidate their knowledge of the language. Listening material is provided across three class CDs. New vocabulary is introduced regularly and this is followed by controlled practice activities, allowing students to immediately activate the language in a supported way. There are also freer practice activities where students can focus on their fluency. In the Everyday English sections, useful chunks of language are presented, which students can use in several different social contexts.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First + second	2	The theme of this first unit is getting to know people. It provides general revision of key tenses and question forms, and Granted the opportunity to assess new students' strengths and weaknesses. All the verb forms covered are dealt with in greater depth in later units of the course.	**Getting to know you** • Questions • Tense revision • Right word, wrong word • Social expressions	1-Method of giving lectures 2- Student groups 3- Reports and studies	1-Exams of various types 2- Feedback from students 3-The method of expression with faces 4- Reports and studies
Third + Fourth	2	The theme of this unit is happiness and things you like doing. This provides ample opportunity for students to Personalize the key language. The main grammar focus is on present tenses, and have and have got in contrast. Skills work includes	**Whatever makes you happy.** • Present tenses • have/have got • Things I like	1-Method of	1-Exams of various types 2- Feedback from students

		integrated reading and speaking, and listening and speaking practice. The Everyday English section introduces and practices ways of keeping a conversation going. The Writing syllabus continues with a focus on style	doing • Making conversation	giving lectures 2- Student groups 3- Reports and studies	3-The method of expression with faces 4- Reports and studies
Fifth + Sixth	2	The theme of this unit is telling stories. The Past Simple is revised and the Past Continuous introduced in the context of the story of an adventurer, and there are a number of news stories to contextualize and practice the main language. The Listening and speaking section focuses on radio news, and the Reading and speaking has a human interest story that achieved worldwide coverage on the Internet. The Vocabulary section focuses on adverbs and their position in a sentence, both adverbs of manner that end in -Iy, and other adverbs. The Everyday English section deals with time expressions - saying dates and using the correct preposition. The Writing section consolidates the tenses and use of adverbs in a story-building task.	**What's in the news?** • Past Simple and Continuous • Adverbs • Saying when	1-Method of giving lectures 2- Student groups 3- Reports and studies	1-Exams of various types 2- Feedback from students 3-The method of expression with faces 4- Reports and studies
Seventh +		The theme of this unit is food, drink, and eating out. In the opening section, expressions of quantity are introduced in the context of a couple with an unusual diet. In a separate presentation	**Eat, drink, and be merry!** •Expressing quantity.	1-Method of giving lectures	1-Exams of various types 2- Feedback from students

eighth	2	about a man who lived to a great age, there is revision and extension of the use of articles in English. The Reading and speaking is about three unusual places to eat.The Vocabulary and listening covers parities	•something/no one ... • Articles • A piece of ... •Can you come for dinner?	2- Student groups 3- Reports and studies	3-The method of expression with faces 4- Reports and studies
Ninth + Tenth	2	The themes of hopes, ambitions, and plans provide the context for the presentation and practice of verb patterns and ways of talking about the future. Going to, will, and the Present Continuous for future are contrasted. The skills practice includes a Listening and speaking section on being 20-something, and a Reading and speaking section on a girl who has hope for the future. Everyday English practices the language of expressing doubt and certainty. The Writing syllabus continues with a section on writing to prepare a talk on 'my dreams for the future'.	**Looking forward** •Verb patterns • Future forms • Phrasal verbs •Expressing doubt and certainty	1-Method of giving lectures 2- Student groups 3- Reports and studies	1-Exams of various types 2- Feedback from students 3-The method of expression with faces 4- Reports and studies
Eleventh + twelfth	2	The theme of this unit is describing people and places. This provides a useful context to practice the grammar for this unit - What ... like?, and comparatives and superlatives. The text in the Reading and speaking section describes the multicultural diversity of	**The way I see it** •What ... like? • Comparatives and superlatives • Synonyms and antonyms •What~ on?	1-Method of giving lectures 2- Student groups 3- Reports and	1-Exams of various types 2- Feedback from students 3-The method of

		London. In the Listening and speaking section, three people talk about who they most resemble in their family. The Everyday English syllabus continues with the language for talking about what's on in a cit)		studies	expression with faces 4- Reports and studies
Thirteen + Fourteen	2	The theme of living history provides an ideal context for the presentation and practice of the Present Perfect Because it shows how the past links with the present. The first grammar presentation highlights the 'unfinished past' use of the Present Perfect. The second highlights the 'experience' use of the Present Perfect. The theme of living history is carried through the skills practice with a Reading section on living in a stately home, and a Listening and speaking section on researching your family history. Vocabulary practice is on the use of suffixes in word formation and the Everyday English section is on the use of question tags when asking for agreement. The Writing syllabus continues with writing a biography of a famous person.	**Living history** •Present Perfect • for and since • ever and never • Word formation •Agree with me!	1-Method of giving lectures 2- Student groups 3- Reports and studies	1-Exams of various types 2- Feedback from students 3-The method of expression with faces 4- Reports and studies
		This unit looks at aspects of gender from a range of perspectives and introduces the functional language	**Girls and boys**	1-Method of	1-Exams of various types

Fifteenth + Sixteenth	2	of obligation and advice. The first presentation focuses on have to/ don't have to and the second presents should and must. Skills practice is provided in the form of a Listening and speaking section on a female heptathlete, and a Reading and speaking section on two families with very different profiles. Vocabulary practice is on things to wear, and the Everyday English section focuses on the functional language used at the doctor's. Writing practice is provided with a section on formal letters and emails.	• have to/don't have to • should/must • things to wear • at the doctor's	giving lectures 2- Student groups 3- Reports and studies	2- Feedback from students 3-The method of expression with faces 4- Reports and studies
Seventeenth + Eighteen	2	This unit looks at the theme of storytelling in different genres. Both grammar sections use adaptations of a fable by Aesop to contextualize the target language of narrative tenses and the Past Perfect, and conjunctions of time, result. reason, and contrast. Skills practice is in the form of a Listening and speaking section on two classic writers, and a Reading and speaking section with a picture story of The Strange Case of Or Jekyll and Mr Hyde. Vocabulary practice is on adjectives that describe feelings and the Everyday English focuses on exclamations with so and such. The	**Time for a story** •Past Perfect and narrative tenses • Joining sentences Feelings • Exclamations	1-Method of giving lectures 2- Student groups 3- Reports and studies	1-Exams of various types 2- Feedback from students 3-The method of expression with faces 4- Reports and studies

		Writing section carries through the theme of stories with tasks to help students write a review of a book or film.			
nineteen + Twenty	2	The themes of this unit are communication and technology. The story of the development of the mobile phone is used to contextualize and practice passives. The Vocabulary syllabus continues with a focus on collocation. The Reading and speaking section carries through the theme with an article about five firsts on the Internet. In the Listening and speaking section, a man complains about aspects of modern life. Everyday English practices useful telephone language, and the Writing section focuses on planning and linking ideas in a pros and cons essay.	**Our interactive world** •Passives • Compound nouns • Words that go together • On the phone	1-Method of giving lectures 2- Student groups 3- Reports and studies	1-Exams of various types 2- Feedback from students 3-The method of expression with faces 4- Reports and studies
Twenty-One +	2	The overall theme of this unit is life's ups and downs. The story of an extraordinary music teacher provides the context for contrasting the Present Perfect Simple and Present Perfect Continuous. Tense practice is also provided in an information gap on the singer	**Life's what you make it!** •Present Perfect Continuous •	1-Method of giving lectures 2- Student	1-Exams of various types 2- Feedback

Twenty-two		Charlotte Church. Listening and speaking gives further consolidation of the main tenses with a focus on two friends who haven't met since school. eading and speaking has a focus on four generations of the Getty family. The Vocabulary and listening and Everyday English sections are linked by practicing the vocabulary of birth, marriage, and death, and the language of giving good and bad news. The Writing section focuses on filling in forms	Tense Review • Birth, marriage, and death Good news, bad news	groups 3- Reports and studies	from students 3-The method of expression with faces 4- Reports and studies
Twenty-Three + Twenty-four	2	The theme of this unit is thinking about the future and what will or might happen. This provides the context for the two grammar presentations, starting with the first conditional and might, and moving on to the second conditional. In the Listening and speaking section, two people speculate about changes they face in their lives. The Reading and speaking section focuses on the wonders of the Universe. The Vocabulary section focuses on prepositions, and Everyday English practices the language of saying thank you and goodbye. The Writing syllabus concludes with a focus on note-taking.	**Just wondering ...** •If + will/might/would conditionals • Prepositions Thank you and goodbye!	1-Method of giving lectures 2- Student groups 3- Reports and studies	1-Exams of various types 2- Feedback from students 3-The method of expression with faces 4- Reports and studies

Twenty-Five + Twenty-six	2	You are part of the editorial team of a newspaper. Choose the four stories that you think are the most important. In groups of four, discuss which are the four top stories for tomorrow's newspaper. Choose the top headline for the front page. Compare your front page headlines with other editorial teams. Give reasons for your choices.	**What's Important to me** • Think about your past, present, or future and write a note for each • Spot the difference •Today's top headlines	1-Method of giving lectures 2- Student groups 3- Reports and studies	1-Exams of various types 2- Feedback from students 3-The method of expression with faces 4- Reports and studies
Twenty-Seven + twenty-eighth	2	This focus of this stage is common collocations of noun + preposition. Pre-teach/check recipe, central heating, damage l'dcemrd3/, butterflies, and cure. Elicit the answer to number 1 as an example. Give students time to complete the sentences, then check the answers. As an extension, you could get students to use three or four of the collocations in a series of sentences or a short	**Snakes and ladders** •Phrasal verbs pair-up •What's it like? •How long have you ... ?	1-Method of giving lectures 2- Student groups 3- Reports and studies	1-Exams of various types 2- Feedback from students 3-The method of expression with faces 4- Reports and studies

Twenty-Nine + Thirty	2	Cognitive outcomes Elicit the opening line of each conversation (see Answers below). Tell students that there are a different number of lines in each conversation. Give them time to do the ordering task, either working in groups or moving round the class in a mingle.	**Passives quiz** •Present Perfect picture race •Thank you and goodbye	1-Method of giving lectures 2- Student groups 3- Reports and studies	1-Exams of various types 2- Feedback from students 3-The method of expression with faces 4- Reports and studies

11. Course Evaluation

Daily preparation	3
Daily exams	5
Extracurricular activities	2
First semester exam / theoretical - 1	20
Second semester exam / theoretical - 2	20
Final exam / theoretical	50

12. Learning and Teaching Resources

New Headway

Fourth edition

Pre-Intermediate Student's Book

Liz and John Soars Amanda Maris

with Teacher's Resource Disc

OXFORD

UNIVERSITY PRESS

www.oup.com/elt

Course Description Form

1. Course Name: Computer
2. Decision Code
3. Semester/Year: First &Second Semester/Second Year
4. Date of preparation of this description: 17/12/2025
5. Attendance: Daily attendance is mandatory.
6. Number of Class Hours (Total)/Number of Units (Total): 30 hours/2 units/ One hour per week.

7. Name of Course Supervisor: (If more than one name is prohibited)

Name: Assist. Lect. Haneen Safi Kadhim

Email: Haneen.kadhim@atu.edu.iq

8. Course objectives:

1. **Identifying network types and core components.**
2. **Grasping network security basics and common threats.**
3. **Learning to troubleshoot network issues using command-line tools.**
4. **Comprehending electronic banking services like online banking, ATMs, and debit cards.**
5. **Familiarizing with phone banking, SMS banking, electronic alerts, and mobile banking.**
6. **Learning to diagnose and resolve common hardware and software problems.**
7. **Diagnosing and repairing hardware components, and utilizing Safe Mode for troubleshooting.**
8. **Troubleshooting operating system issues, identifying and resolving blue screen errors, and addressing slow computer performance.**
9. **Identifying key characteristics, benefits, challenges, and ethical considerations of AI.**
10. **Discussing the limitations of AI and the role of data in AI systems.**
11. **Familiarizing with AI tools and frameworks.**
12. **Gaining an overview of AI applications in various industries, including education and healthcare.**
13. **Exploring AI applications in transportation and advertising.**
14. **Understanding the role of AI in finance, robotics, and automation technologies.**
15. **Learning about AI in marketing, particularly in targeting and personalization.**
16. **Examining AI in image and video analysis, and smart cities.**

17. Discussing future trends in AI applications and tools

9. Teaching and learning strategies:

1. **Theoretical lectures**
2. **Presentations**
3. **Students are assessed individually by providing opportunities for classroom participation through answering questions.**
4. **Students are assessed collectively through daily exams with practical and theoretical questions.**
5. **Exams for the first and second semesters and final exams for the first and second semesters.**
6. **Using modern methods to present theoretical and practical aspects.**
7. **Assigning students classroom assignments that require self-explanation and self-development.**
8. **Questioning students through discussion groups by posing intellectual questions such as "how, why, when, where, and which" on specific topics.**
9. **Using brainstorming and feedback methods to activate students' accumulated experiences by linking what they have learned from previous academic levels with new knowledge.**

10. Course structure

Week	Desired Learning Outcomes	Unit or Topic	Name Learning Method	Assessment Method
1.	Understanding the topic of unity	Security and Networking, What is a network, Types of networks. Basic network components.	Lecture	Live Assessment + Exams
2.	Understanding the topic of unity	Security and Networking , Basic network components	Lecture	Live Assessment + Exams
3.	Understanding	Security and Networking , Network	Lecture	Live Assessment

	the topic of unity	**Security Basics. Understanding network threats. Network Troubleshooting**		**+ Exams**
4.	**Understanding the topic of unity**	**Security and Networking (Cont.): Introduction to Network Troubleshooting, Common Network Issues and Symptoms, Network Troubleshooting Tools and Utilities.**	**Lecture**	**Live Assessment + Exams**
5.	**Understanding the topic of unity**	**Security and Networking (Cont.): Using Command-Line Tools for Diagnostics, Identifying and Resolving Connectivity Issues, Diagnosing Network Performance Problems.**	**Lecture**	**Live Assessment + Exams**
6.	**Understanding the topic of unity**	**E-Commerce: Concepts of Electronic banking services this include online banking: ATM and debit card services.**	**Lecture**	**Live Assessment + Exams**
7.	**Understanding the topic of unity**	**E-Commerce , Phone banking, SMS banking, electronic alert, Mobile banking.**	**Lecture**	**Live Assessment + Exams**
8.	**Understanding the topic of unity**	**Computer Troubleshooting: Introduction to Computer Troubleshooting, Common Hardware Issues and Solutions, Diagnosing Software Problems.**	**Lecture**	**Live Assessment + Exams**
9.	**Understanding the topic of unity**	**Computer Troubleshooting , Hardware Components: Diagnosis and Repair, Using Safe Mode for Troubleshooting.**	**Lecture**	**Live Assessment + Exams**
10.	**Understanding the topic of unity**	**Computer Troubleshooting , Troubleshooting Operating System Issues, Identifying and Resolving Blue Screen Errors, Dealing with Slow Computer**	**Lecture**	**Live Assessment + Exams**

		Performance.		
11.	**Understanding the topic of unity**	**Computer Troubleshooting , Virus and Malware Removal Techniques, Updating Drivers and Software.**	**Lecture**	**Live Assessment + Exams**
12.	**Understanding the topic of unity**	**Introduction to AI, Definition of AI, History of AI, AI Techniques and Approaches**	**Lecture**	**Live Assessment + Exams**
13.	**Understanding the topic of unity**	**Introduction to AI , Key Characteristics of AI, Benefits of AI, Challenges and Ethical considerations.**	**Lecture**	**Live Assessment + Exams**
14.	**Understanding the topic of unity**	**Introduction to AI , Challenges and Limitations of AI, The Role of Data in AI Systems.**	**Lecture**	**Live Assessment + Exams**
15.	**Understanding the topic of unity**	**Introduction to AI ,AI Tools and Frameworks.**	**Lecture**	**Live Assessment + Exams**
16.	**Understanding the topic of unity**	**The Role of AI in Modern Smartphones, AI-Driven Mobile Technologies, Virtual Assistants (Siri, Google Assistant, Alexa).**	**Lecture**	**Live Assessment + Exams**
17.	**Understanding the topic of unity**	**The Role of AI in Modern Smartphones, Adaptive Learning, Real-Time Translation Services.**	**Lecture**	**Live Assessment + Exams**
18.	**Understanding the topic of unity**	**The Role of AI in Modern Smartphones , The Future of AI in Smartphone Technology, Challenges of Implementing AI in Mobile Devices.**	**Lecture**	**Live Assessment + Exams**

19.	**Understanding the topic of unity**	**Applications and Tools of AI: Overview of AI Applications in Various Industries, Education and Healthcare.**	**Lecture**	**Live Assessment + Exams**
20.	**Understanding the topic of unity**	**Applications and Tools of AI , Transportation and Advertising.**	**Lecture**	**Live Assessment + Exams**
21.	**Understanding the topic of unity**	**Applications and Tools of AI , Finance, Robotics and Automation Technologies.**	**Lecture**	**Live Assessment + Exams**
22.	**Understanding the topic of unity**	**Applications and Tools of AI , AI in Marketing: Targeting and Personalization.**	**Lecture**	**Live Assessment + Exams**
23.	**Understanding the topic of unity**	**Applications and Tools of AI , AI in Image and Video Analysis, Smart Cities.**	**Lecture**	**Live Assessment + Exams**
24.	**Understanding the topic of unity**	**Applications and Tools of AI ,Future Trends in AI Applications and Tools.**	**Lecture**	**Live Assessment + Exams**
25.	**Understanding the topic of unity**	**AI and Society, Introduction to AI and Its Societal Impact, The Role of AI in Enhancing Public Safety.**	**Lecture**	**Live Assessment + Exams**
26.	**Understanding the topic of unity**	**AI and Society , Cultural Perspectives on AI Adoption, AI and Governance: Policy Implications**	**Lecture**	**Live Assessment + Exams**
27.	**Understanding the topic of unity**	**Ethical Challenges in AI: Introduction to Ethics in AI, Transparency and Explainability of AI Systems, Privacy Concerns in AI Data Usage.**	**Lecture**	**Live Assessment + Exams**

28.	Understanding the topic of unity	Ethical Challenges in AI (Cont.): The Ethical Implications of Autonomous Systems, Ethics in AI-Driven Marketing and Advertising.	Lecture	Live Assessment + Exams
29.	Understanding the topic of unity	Ethical Challenges in AI (Cont.): Ethical Considerations in Education, Human Rights and AI Implementation.	Lecture	Live Assessment + Exams
30.	Understanding the topic of unity	The Future of AI, Future trends in AI, recent research and emerging technologies.	Lecture	Live Assessment + Exams

11. Course Evaluation

First Semester Exams

20 marks – Theory
5 marks – Evaluation (Daily Tests)

Second Semester Exams

10 marks – Theory
5 marks - Evaluation (Daily Tests)

Final Exam

50 marks – Theory

12. Learning and teaching resources.

Required textbooks (methodology, if available)	**Textbooks**
Primary references (sources)	**Subject-related references available in the institute's library**
Recommended supporting books and references (scientific journals, reports, etc.)	• **Graham Brown, David Watson, "Cambridge IGCSE Information and Communication Technology", 3rd Edition (2020).** • **Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology In Action Complete", 16th Edition**

	(2020). • **Ahmed Banafa, "Introduction to Artificial Intelligence (AI)", 1st Edition (2024).** • **Microsoft Office 2019 Step by Step 1st Edition by Curtis Frye & Joan Lambert** • **[Al-Khidr Ali Al-Khidr Bahhath, "Computer Fundamentals" (2016)]** • **[Dr. Adel Abdel Nour, "Introduction to the World of Artificial Intelligence" (2005)].**
Electronic references, websites	**The institute's website, various internet sources, and international company websites.**

Course description template

1. Course Name: Electrical Networks
2. code : KTED122 -
3. Term/ Year: Term 1 and Term 2 / Year 2
4. Date this description was prepared :17/12/2025
5. Available attendance forms : Mandatory daily attendance
6. Total study hours/total units : 120 hours/8 units
7. Name of the course coordinator (if there is more than one, please mention it.(
Name: M .M. Ali Mohammed Abdul Sada Al -A .Email : ali.abdalsadaa.ikr24@atu.edu.iq

8. Course objectives

The student will be able to know: **1 -Stages of the electrical system.** **2 -How to generate, transmit and distribute electrical energy.** **3 -How to control and protect the components of the electrical system.** **-4 The economic aspect of the electrical system.**	**Course objectives**

9. Teaching and learning strategies

1-Theoretical lectures and practical applications **2-presentations** **3-are assessed individually by giving them the opportunity to participate in class by answering questions.** **4-are assessed collectively through daily exams with practical and theoretical questions.** **5-Exams for the first and second semesters and final exams for the first and second rounds .** **6-Using modern methods to present the theoretical and practical aspects, such as various electronic display devices. To attract the attention and interest of the students so that the idea reaches the student in a better way .** **Giving students classroom assignments requires them to demonstrate skills and provide self-explanatory interpretations through testing methods.** **Questioning students through discussion groups by posing intellectual questions such as how, why, when, where , and what** **For specific topics.** **Using brainstorming and feedback techniques to activate students' accumulated experiences by linking what was learned in previous academic stages to new material.** **To equip students with practical skills through practical applications on laboratory equipment .**	**Strategy**

10. Course structure

Evaluatio Method n	Learning method	or topic name Unit	Required learning	Hours	Week

			outcomes		
Live assessment + exams	Lectures+ Practical applications	How to generate electrical energy, energy evolution , electrical power system In both generation and consumption, standard efforts	Understanding the subject of unity	8	First and second
Live assessment + exams	Lectures+ Practical applications	Hydroelectric and thermal power plants	Understanding the subject of unity	4	the third
Live assessment + exams	Lectures+ Practical applications	Gas-fired power plants and an overview of some other plants such as diesel	Understanding the subject of unity	4	Fourth
Live assessment + exams	Lectures+ Practical applications	Vertical busbar system) BB (and diagrams for transformer stations Inside and outside buildings	Understanding the subject of unity	4	Fifth
Live assessment + exams	Lectures+ Practical applications	Overhead lines, their uses, and the division of lines into short lines. Medium-long	Understanding the subject of unity	4	Sixth
Live assessment + exams	Lectures+ Practical applications	Overhead lines - mechanical calculations, including: Calculating tension and relaxation when the dimensions are from the surface The land is equal -Calculate the weight of the snow accumulated on the wire.	Understanding the subject of unity	4	Seventh

		Calculating the amount of wind pressure acting on the wire			
Live assessment + exams	**Lectures+ Practical applications**	**Calculations of the basic elements of overhead lines - Electrical calculations Among them: Resistance calculation Calculating the internal and external inductance of a single wire Calculating the inductance of a three-wire system far away They are separated from each other by equal distances, or by different distances, or they alternate locations.**	**Understanding the subject of unity**	**4**	**Eighth**
Live assessment + exams	**Lectures+ Practical applications**	**-Capacity calculation for a single-wire, three-wire system They are separated from each other by equal or different distances and they exchange On the site**	**Understanding the subject of unity**	**4**	**Ninth**
Live assessment + exams	**Lectures+ Practical applications**	**Solving various problems from weeks seven and eight**	**Understanding the subject of unity**	**4**	**tenth**
Live assessment + exams	**Lectures+ Practical applications**	**Solving short circuits involves representing them as an electrical circuit and**	**Understanding the subject of unity**	**4**	**eleventh**

		calculating their efficiency. Solve the middle lines and divide them into T is represented as an electrical circuit in the shape of the letter- π is represented as a letter-shaped electrical circuit.			
Live assessment + exams	**Lectures+ Practical applications**	**Overhead transmission line insulators: types, shapes, installation , and phenomena Discharge, its causes, and methods used to get rid of it.**	**Understanding the subject of unity**	**4**	**the second ten**
Live assessment + exams	**Lectures+ Practical applications**	**cables - their components - their classification - cable range**	**Understanding the subject of unity**	**4**	**thirteenth**
Live assessment + exams	**Lectures+ Practical applications**	**Calculating the capacitance and inductance of single-pole and three-pole underground cables**	**Understanding the subject of unity**	**4**	**The fourth ten**
Live assessment + exams	**Lectures+ Practical applications**	**Voltage gradient in cables , calculation of loss and its angle in cable breakdown insulators**	**Understanding the subject of unity**	**4**	**fifteenth**
Live assessment + exams	**Lectures+ Practical applications**	**High voltage cables - their components - their types**	**Understanding the subject of unity**	**4**	**Sixteenth**
Live assessment + exams	**Lectures+ Practical applications**	**Distribution networks and DC distributors that supply power from one side Feeds - that which feeds from both ends.**	**Understanding the subject of unity**	**4**	**Seventh ten**

		AC power distributors that feed from one end			
Live assessment + exams	**Lectures+ Practical applications**	**All types of ring diffusers - a comparison between different types**	**Understanding the subject of unity**	**4**	**Eighth ten**
Live assessment + exams	**Lectures+ Practical applications**	**Solve various examples about weeks sixteen and seventeen**	**Understanding the subject of unity**	**4**	**Ninth ten**
Live assessment + exams	**Lectures+ Practical applications**	**Conditions for stability of the power curve Loading :How synchronous generators work in parallel with each other and with The network**	**Understanding the subject of unity**	**4**	**Twenty**
Live assessment + exams	**Lectures+ Practical applications**	**Methods for improving the power factor are divided into: Static capacitors - Motor security - Phase-front devices**	**Understanding the subject of unity**	**4**	**Twenty-one**
Live assessment + exams	**Lectures+ Practical applications**	**Types of errors in electrical networks and their classification to me-: -Symmetrical faults and calculation of fault current in an electrical circuit Inconsistent errors and calculation Fault current in the circuit Electric PU) Calculation of basic units)**	**Understanding the subject of unity**	**4**	**Twenty-two**
Live	**Lectures+**	**Protection principles , their**	**Understanding**	**4**	**Twenty-**

assessmen t + exams	Practical applications	definition, various systems , and uses of relays Protection and disconnection – circuit breakers in electrical power systems and devices Measurement, including: Voltage measuring transformers - Current measuring transformers	the subject of unity		third
Live assessmen t + exams	Lectures+ Practical applications	Follow-ups, their classification according to their operating theory, inductive follow-ups against increase Current, against reverse power ,electronic tracking	Understanding the subject of unity	4	Fourth And the twenty
Live assessmen t + exams	Lectures+ Practical applications	How to protect overhead transmission lines Distance protection (line impedance measurement protection(BB)rods(	Understanding the subject of unity	4	Fifth The twentieth
Live assessmen t + exams	Lectures+ Practical applications	How to protect power transformers using Differential Protection	Understanding the subject of unity	4	Sixth The twentieth
Live assessmen t + exams	Lectures+ Practical applications	How to protect the generators during operation Differential Protection - Digital Protection - Reverse Power Protection -	Understanding the subject of unity	4	Twenty-seventh
Live	Lectures+	Protecting the stator from	Understanding	4	Twenty-

assessmen t + exams	Practical applications	overcurrent and protecting the rotor.	the subject of unity		eighth
Live assessmen t + exams	Lectures+ Practical applications	Percentage Reactance	Understanding the subject of unity	4	Twenty-ninth
Live assessmen t + exams	Lectures+ Practical applications	Power circuit diagram at the receiving end	Understanding the subject of unity	4	thirty

11. Course evaluation

First semester exams

marks – Theory10

marks – practical10

points – Rating 5

Second semester exams

marks – Theory10

marks – practical10

-Assessment (Daily Tests(5

Final exam

degrees – Theory 40

marks – practical 10

12. Learning and teaching resources

Textbooks	Required textbooks (methodology, if applicable(
-1Electrical Power, authored by Dr. Abdul Sahib Hassan Majeed. -2Electrical Networks, prepared by Hashem Abdul-Razzaq Zalzala and Armin Mekerdjian.	Main references (sources(
- 1Electrical Measurements, authored by Dr. Muzaffar Anwar Al-Na'ma and Dr. Sinan Mahmoud. 2- A Text Book on Power System Engineering By A.Chakrabarti , MLSoni , PVGupta and US Bhatnagar .	Recommended supporting books and references (scientific journals, reports(...
The institute's website, various internet sources, and websites of global electricity companies.	Electronic references, websites

description template Course

1. Course Name :Programmable Logic Controller (PLC)
2. Course code :KTED128 -
3. Term/Year: Term 2 (Month 1 and Month 2 / (Year 2
4. Date this description was prepared: 17/12/2025
5. Available attendance options: Mandatory daily attendance
6. Total study hours/total units: 3 hours / 3 units
7. Name of the course coordinator (if there is more than one, please mention it.(
Name : M.M .Abbas Fadhil Mohammed Al A'a : fadel.mohammed@atu.edu.iq

8. Course objectives

The student will be able to know: **1- Preparation student To learn about the programmable logic controller and its operating principle** **2- Identifying its types, components , connection methods , and programming Its uses include controlling and monitoring various control circuits and other electrical circuits.**	**Course objectives**

9. Teaching and learning strategies

5. Theoretical lectures and practical applications **6. presentations** **7. Students are assessed individually by giving them the opportunity to participate in class by answering questions.** **8. Students are assessed collectively through daily exams with practical and theoretical questions.** **9. Monthly exams during the second semester and final exams for the first and second semesters .** **10. Giving students classroom assignments requires them to demonstrate skills and provide self-explanatory interpretations through testing methods.** **11. Questioning students through discussion groups by posing intellectual questions such as how, why, when, where , and which For specific topics.** **12. Using brainstorming and feedback techniques to activate students' accumulated experiences by linking what was learned in previous academic stages to new material.** **13. To equip students with practical skills through practical applications on laboratory equipment .**	**Strategy**

10. Course structure

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Live assessment + exams	Lectures+ Practical applications	Introduction to Programmable Logic Controllers	Understanding the subject of unity	3	the first
Live assessment + exams	Lectures+ Practical applications	Number systems and codes	Understanding the subject of unity	3	the second
Live assessment + exams	Lectures+ Practical applications	Logic circuits	Understanding the subject of unity	3	the third
Live assessment + exams	Lectures+ Practical applications	Processor introduction, power supply, programming devices	Understanding the subject of unity	3	Fourth
Live assessment + exams	Lectures+ Practical applications	Memory and its types	Understanding the subject of unity	3	Fifth
Live assessment + exams	Lectures+ Practical applications	Memory structure and addresses	Understanding the subject of unity	3	Sixth
Live assessment + exams	Lectures+ Practical applications	Types of input and output units	Understanding the subject of unity	3	Seventh
Live assessment + exams	Lectures+ Practical applications	Installing the logic controller with input/output units	Understanding the subject of unity	3	Eighth
Live assessment + exams	Lectures+ Practical applications	Analog input system	Understanding the subject of unity	3	Ninth
Live assessment +	Lectures+ Practical	Analog output system	Understanding the subject of	3	Tenth

exams	applications		unity		
Live assessment + exams	Lectures+ Practical applications	Special functions and their relationship to input and output	Understanding the subject of unity	3	Eleventh
Live assessment + exams	Lectures+ Practical applications	Programming languages	Understanding the subject of unity	3	Twelfth
Live assessment + exams	Lectures+ Practical applications	Meters: Installation and Types	Understanding the subject of unity	3	the third Ten
Live assessment + exams	Lectures+ Practical applications	Documentation system in the programmable logic controller	Understanding the subject of unity	3	Fourteenth
Live assessment + exams	Lectures+ Practical applications	Performance and specifications of the programmable logic controller	Understanding the subject of unity	3	Fifteenth

11. Course evaluation

Second semester exams

First month: 10 marks – Theory

First month: 10 marks – practical

Second month, 10 marks – theory

Second month, 10 marks – practical

10points - Rating

12. Learning and teaching resources

• Logic Control Book Project • Logical Control Theory and Practice	Required textbooks (methodology, if applicable(
• Electrical Technology (Edward Hughes) • Basic Circuits (AMF Brooks) Pergaman Press. • Introduction to Electric circuits (M. Romanwitz) John Willy	Main references (sources(

• **Basic Electrical Engineering (Fitzgerald & Rlgginborthan) Mc – Graw – Hill** • **Source of practical material** • **Electrical Technology (Edward Huges)** • **Basic Electrical Engineering**	
	Recommended supporting books and references (scientific journals, reports(...
Scientific websites and e-learning platform programs	**Electronic references, websites**

description template Course

1. Course Name: Maintenance Lab Workshop
2. Course code : KTED124 -
3. Term/ Year: Annual (First and Second Terms) / Second Year
4. Date this description was prepared:17/12/2025
5. Available attendance forms : Mandatory daily attendance
6.
7. Total study hours/total units : 120 hours/8 units

8. Name of the course coordinator (if there is more than one, please mention it.(

Name: M. Mahmoud Hakim Enad Al -A .Email :mahmood.enad@atu.edu.iq

9. Course objectives

1 Disassembles and assembles electrical machine parts **2 He inspects electrical machines after winding them.** **3 It distinguishes between electrical appliances and improves the selection process.** **4 It uses the various devices, tools, and components used in workshops.** **5 Gaining skills and technical expertise in various electrical maintenance works** **6 Gain self-confidence to perform electrical technical work by troubleshooting faults and learning how to repair them.** **7 It identifies and recognizes different electrical and electronic components and how to use them in building various circuits.**	**Course objectives**

10. Teaching and learning strategies

• **Weekly reports** • **Field visits** • **Using brainstorming and feedback techniques** • **Practical extracurricular tasks** • **Practical skills within laboratories**	**Strategy**

11. Course structure

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
• **Continuous assessment throughout the academic year lectures** • **My day has come**	• **Theoretical lectures** • **and applied lectures** **Scientific visit**	**DC motor installation – DC motor rewinding methods – Detailed diagram**	**Understanding the unit's subject matter + practical application skills**	**4**	**the first**

• A semi-annual exam.					
• Continuous assessment throughout the academic year lectures • My day has come • A semi-annual exam.	• Theoretical lectures • and applied lectures Scientif visits	How to clean the surface of the units – Installing carbon brushes – Application of carbon brushes	Understanding the unit's subject matter + practical application skills	4	the second
• Continuous assessment throughout the academic year lectures • My day has come • A semi-annual exam.	• Theoretical lectures • and applied lectures Scientific visit	Connection , breakage, and insulation testing	Understanding the unit's subject matter + practical application skills	4	the third
• Continuous assessment throughout the academic year lectures • My day has come • Semi - annual	• Theoretical lectures • and applied lectures Scientific visit	DC generator output coil windings - Information preparation and compilation - Winding the output coil and securing the coils to the iron core slots - Simplified examples of winding	Understanding the unit's subject matter + practical application skills	8	Fourth - Fifth
• assessment throughout the academic	• Theoretical lectures • and applied	Varnish insulation – drying – end connection – final	Understanding the unit's subject matter	4	Sixth And the seventh

year lectures • My day has come • A semi-annual exam.	lectures Scientific visit	selection of the production element – complete drawing of the production element with all its components , connections , and uses	+ practical application skills		
• Continuous assessment throughout the academic year lectures • My day has come • Semi - annual	• Theoretical lectures • and applied lectures Scientific visit	Field coils – Information gathering for parallel and series coils – Formation of large cross-section conductors – Properties of series and parallel field coils and methods of connecting them in the machine. Winding on the die.	Understanding the unit's subject matter + practical application skills	4	Eighth
• Continuous assessment throughout the academic year lectures • My day has come • A semi-annual exam.	• Theoretical lectures • and applied lectures Scientific visit	Coil preparation and single-pole mounting – full machine testing – electrical transformer – preparation, cutting, and assembly of iron core plates – coil winding,	Understanding the unit's subject matter + practical application skills	4	Ninth

		varnishing, and training on creating a simplified template) form (before winding			
• **Continuous assessment throughout the academic year lectures** • **My day has come** • **Semi - annual**	• **Theoretical lectures** • **and applied lectures** **Scientific visit**	**Connecting and linking terminals – Polarity testing – Continuity testing – Node testing and insulation testing in windings. Examples of designing and rewinding a small-power transformer.**	**Understanding the unit's subject matter + practical application skills**	**4**	**tenth**
• **Continuous assessment throughout the academic year lectures** • **My day has come** • **Semi – annual**	• **Theoretical lectures** • **and applied lectures** **Scientific visit**	**Study of three-phase transformers – simple design and detailed drawing**	**Understanding the unit's subject matter + practical application skills**	**4**	**eleventh**
• **assessment throughout the academic year lectures** • **My day has come** • **A semi-annual exam.**	• **Theoretical lectures** • **and applied lectures** **Scientific visit**	**Preparing ,cutting, and assembling the iron core sheets – winding the coils – fixing and varnishing – drying**	**Understanding the unit's subject matter + practical application skills**	**4**	**the second ten**
• **Continuous assessment**	• **Theoretical lectures**	**Polarity test -**	**Understanding**	**8**	**the**

throughout the academic year lectures • My day has come • A semi-annual exam.	• and applied lectures Scientific visit	Continuity test - Earth leakage test - Short circuit test - Insulation test and measurement	the unit's subject matter + practical application skills		third ten And the fourth ten
• Continuous assessment throughout the academic year lectures • My day has come • A semi-annual exam.	• Theoretical lectures • and applied lectures Scientific visit	Induction Motors: Stator winding rewinding for a three-phase squirrel-cage induction motor – Calculating and drawing the general shape of the windings, removing insulation and cleaning the slots – Insulating the stator slots – Winding and shaping the windings, then securing them to the slots	Understanding the unit's subject matter + practical application skills	4	fifteenth
• Continuous assessment throughout the academic year lectures	• Theoretical lectures • and applied lectures Scientific visit	Winding and connecting the ends of the coils and testing for continuity	Understanding the unit's subject matter + practical application	4	Sixteenth

• My day has come • A semi-annual exam.			skills		
• Continuous assessment throughout the academic year lectures • My day has come • A semi - annual exam	• Theoretical lectures • and applied lectures Scientific visit	Selecting the contract in the files – Selecting and measuring the insulation – Selecting the ground leakage for the motor	Understanding the unit's subject matter + practical application skills	4	Seventh ten
• Continuous assessment throughout the academic year lectures • My day has come • A semi-annual exam.	• Theoretical lectures • and applied lectures Scientific visit	Motor assembly and testing under its designated load – Study of the starting phase of three-phase motors – Direct method – Self-starting method	Understanding the unit's subject matter + practical application skills	4	Eighth ten
• Continuous assessment throughout the academic year lectures • My day has come • A semi-annual exam.	• Theoretical lectures • and applied lectures Scientific visit	Induction motor protection devices and the use of timers	Understanding the unit's subject matter + practical application skills	4	Ninth ten
• Continuous	• Theoretical	Changing the final	Understanding	4	Twenty

assessment throughout the academic year lectures • My day has come • A semi-annual exam.	lectures • and applied lectures Scientific visit	motor terminal connection from star to delta The motor originally operates in Y mode - Δnote the differences in current and torque in both cases.	the unit's subject matter + practical application skills		
• Continuous assessment throughout the academic year lectures • My day has come • A semi-annual exam.	• Theoretical lectures • and applied lectures Scientific visit	Single-phase induction motor: A practical study of different types of single-phase induction motors – Motor construction – Capacitor motor – Split-phase motor	Understanding the unit's subject matter + practical application skills	4	Twenty-one
• Continuous assessment throughout the academic year lectures • My day has come • A semi-annual exam.	• Theoretical lectures • and applied lectures Scientific visit	Winding a split-phase motor, performing necessary tests on it, and methods of periodic maintenance – faults and methods of repair – reversing the direction of rotation of the	Understanding the unit's subject matter + practical application skills	4	Twenty-two

		motor			
• **Continuous assessment throughout the academic year lectures** • **My day has come** • **A semi-annual exam.**	• **Theoretical lectures** • **and applied lectures** **Scientific visit**	**Drawing files for a split-phase motor - multiple examples**	**Understanding the unit's subject matter + practical application skills**	**4**	**Twenty-third**
• **Continuous assessment throughout the academic year lectures** • **My day has come** • **A semi-annual exam.**	• **Theoretical lectures** • **and applied lectures** **Scientific visit**	**Winding a shaded pole motor of various types**	**Understanding the unit's subject matter + practical application skills**	**4**	**Fourth And the twenty**
• **Continuous assessment throughout the academic year lectures** • **My day has come** • **A semi-annual exam.**	• **Theoretical lectures** • **and applied lectures** **Scientific visit**	**Continuity test – Polarity test – Ground contact test – Short circuit test**	**Understanding the unit's subject matter + practical application skills**	**4**	**Fifth The twentieth**
• **Continuous assessment throughout**	• **Theoretical lectures** • **and**	**Electrical and mechanical faults and**	**Understanding the unit's**	**4**	**Sixth The**

the academic year lectures • My day has come • A semi-annual exam.	applied lectures Scientific visit	methods of repairing them	subject matter + practical application skills		twentieth
• Continuous assessment throughout the academic year lectures • My day has come • A semi-annual exam.	• Theoretical lectures • and applied lectures Scientific visit	Winding the capacitor-type motor involves performing the necessary tests – polarity continuity test – grounding test – short circuit between windings	Understanding the unit's subject matter + practical application skills	4	Twenty-seventh
• Continuous assessment throughout the academic year lectures • My day has come • A semi-annual exam.	• Theoretical lectures • and applied lectures Scientific visit	the ceiling fan motor The tabletop and conducting the necessary tests	Understanding the unit's subject matter + practical application skills	4	Twenty-eighth
• Continuous assessment throughout the academic year lectures • My day has	• Theoretical lectures • and applied lectures Scientific visit	Home appliance repair – Home refrigerator – Mechanical and electrical faults and	Understanding the unit's subject matter + practical application	4	Twenty-ninth

come • A semi-annual exam.		how to fix them	skills		
• Continuous assessment throughout the academic year lectures • My day has come • A semi-annual exam.	• Theoretical lectures • and applied lectures Scientific visit	Home appliance repair – Home freezers – Home air conditioners – Mechanical and electrical faults and their solutions – Routine maintenance	Understanding the unit's subject matter + practical application skills	4	thirty

12. Course evaluation

First semester exams

(Daily test (continuous assessment

(Theoretical and practical exam (mid-year

Second semester exams

(Daily test (continuous assessment

(Theoretical and practical exam (mid-year

13. Learning and teaching resources

Textbooks	(textbooks (methodology, if applicable Required
References related to the subject matter, department and available at the .institute library	(references (sources Main
learning Reports and an electronic package for the subject, detailing the designed for entire curriculum and .practical application	supporting books and references Recommended (...(scientific journals, reports
The institute's website, various . internet resources	references, websites Electronic

description template Course

1. Course Name :Electrical Machines
2. code : KTED121
3. Semester/ Year :Annual (First and Second Semesters)/Second Stage
4. Date this description was prepared:17/12/2025
5. Available attendance formats : In-person
6. Number of hours (total) / Number of units (total) : 150 hours 60) hours theory + 90 hours practical(/ 10units

7. Name of course coordinator

Name :Dr. Haider Salah Mohammed Al -A'i Email hayder.mohammed@atu.edu.iq

8. Course objectives

A - Introducing students to the basic principles related to the structure of And operating alternating current machines. **b) Understanding theory Operation of transformers, proofreading, analysis , and construction of various types of transformers. Also, testing and analyzing transformer losses and efficiency to improve performance. Her performance.** **c) Enabling students to develop Their skills in selecting and installing different types of transformers and operating it And its maintenance.** **D -Explanation of the construction, structure, types and characteristics of DC generators and DC motors .** **E -Explanation of the principles and characteristics of operating DC generators and motors.**	**Course objectives**

9. Teaching and learning strategies

• **The theoretical lecture.** • **Practical lecture.** • **Discussion with students and among students themselves.** • **Creating reports and projects related to the scientific material of the lecture.** • **Summer training in the private and public sectors.** • **E-learning.**	**Strategy**

10. Course structure

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week

Daily , monthly, and annual exams	Lectures presented in PowerPoint format	Magnetic circuits – Calculating the magnetic motive force – Similarities between magnetic circuits and electrical circuits	Getting to know magnetic circuits	5	the first
Daily , monthly, and annual exams	Lectures presented in PowerPoint format	Basic principles of DC machines - Main parts of machines - (Magnetic poles - Product - External structure.(	Identifying the main components of DC machines	5	the second
Daily , monthly, and annual exams	Lectures presented in PowerPoint format	Types of DC machines: Separate power supply – Self-powered (parallel – series – combined(DC machine efficiency – Losses Types of losses – Constant and variable losses) Power distribution stages in DC machines - Providing mathematical examples of how to calculate efficiency and losses	Identifying the types of DC machines and identifying the types of losses in these machines.	5	the third
Daily , monthly, and annual exams	Lectures presented in PowerPoint format	Electromotive force - Factors affecting electromotive force - Giving mathematical examples of how to calculate electromotive force for all types of	Understanding the electromotive force of DC machines	5	Fourth

		generators.			
Daily , monthly, and annual exams	**Lectures presented in PowerPoint format**	**Studying the magnetization curve (no-load curve) and how to find the critical resistance and critical speed on the magnetization curve. Examples of how to calculate the electromotive force, critical resistance and critical speed of DC machines.**	**Identifying the magnetization curve of DC machines and identifying the critical resistance and critical speed.**	**5**	**The fifth**
Daily , monthly, and annual exams	**Lectures presented in PowerPoint format**	**Studying the load characteristics of all types of DC machines, drawing their corresponding curves, and studying voltage regulation for different types of generators.**	**Identifying the load characteristics of DC machines**	**5**	**The sixth**
Daily , monthly, and annual exams	**Lectures presented in PowerPoint format**	**DC motors Theory of Motor Operation – Reverse Electromotive Force Equation of reverse electromotive force – Comparison between DC motors and generators**	**Identifying the reverse electromotive force of DC motors**	**5**	**The seventh**

Daily , monthly, and annual exams	Lectures presented in PowerPoint format	Determination – Determination on the product – Determination on the drive shaft) shaft (Power distribution in DC motors electromagnetic power in DC motors	Identifying the types of torques for DC motors	5	The eighth
Daily , monthly, and annual exams	Lectures presented in PowerPoint format	General characteristics of speed and torque for motors (parallel - series combined(Speed regulation rate - calculation examples Comparison of DC motors in various industrial applications	Identifying the speed and torque characteristics of DC motors	5	The ninth
Daily , monthly, and annual exams	Lectures presented in PowerPoint format	DC motor speed control Control by domain - Control by product Controlled by product voltage (Ward Leonard(	Understanding methods for controlling the speed of DC machines	5	The tenth
Daily , monthly, and annual exams	Lectures presented in PowerPoint format	Engine testing (stop test – Swinburne test) Hopkinson test The test of increment – mathematical examples – mathematical examples	Identifying the types of DC motor tests	5	Eleventh
Daily ,	Lectures	transformers Electrical /	Understanding	5	The twelfth

monthly, and annual exams	presented in PowerPoint format	Components and parts transformer theory Operation converter With the heart Internal - Converter With the heart External – Equation of power The pusher Electrical - drawing Vectors - Circle Equivalent to the transformer	the basic components and operating theory of electrical transformers		
Daily , monthly, and annual exams	Lectures presented in PowerPoint format	a test The circle Open and the cabin How to account value ingredients The circle The reward – The converter from condition Pregnancy – Plan Al-Touri For the transformer in condition Pregnancy - Losses - Calculation Current efficiency maximum Efficiency - Issues Various	Understanding open circuit and short circuit testing for electrical transformers	5	The thirteenth
Daily , monthly, and annual exams	Lectures presented in PowerPoint format	converter Self – Issues adapter Current - Transformer Effort - Uses The process	Identifying the types of electrical transformers	5	The fourth ten
Daily ,	Lectures	Three-phase	Understanding	5	The fifth

monthly, and annual exams	**presented in PowerPoint format**	**transformers *Different methods for connecting three-phase transformers are problematic.***	**the methods of connecting three-phase transformers**		**ten**
Daily , monthly, and annual exams	**Lectures presented in PowerPoint format**	**Engines induction trilogy Phases Features – Disadvantages – Field magnetic roundabout – theory Operation slip – to hesitate Part roundabout**	**Identifying the parts of induction motors**	**5**	**The sixth ten**
Daily , monthly, and annual exams	**Lectures presented in PowerPoint format**	**Types Engines engines The cage Squirrel - Engines The episodes slip Comparison between them – installation all type – Uses all type**	**Identifying the types of induction motors**	**5**	**The seventeenth**
Daily , monthly, and annual exams	**Lectures presented in PowerPoint format**	**Methods for controlling the starting of induction motors include : direct starting , star-delta switching , autotransformer starting , and starting by connecting resistors in series with the rotor.**	**Understanding methods for controlling the start-up of induction motors**	**5**	**The eighteenth**
Daily , monthly,	**Lectures presented in**	**relationship between determination and**	**Identifying the types of**	**5**	**The nineteenth**

and annual exams	PowerPoint format	coefficient Ability - Relationship between determination and slip determination Start rotation – condition maximum determination Start - Determination rotation – condition maximum determination Rotation - Circle The reward For the engine The inciter Examples Calculation	torques in induction motors		
Daily , monthly, and annual exams	Lectures presented in PowerPoint format	reverse direction rotation Engines induction trilogy Phases - Methods Stop Engines induction – control on Engines Induction using an effort Source - Number Poles - Frequency Source - position Resistance in circle Part roundabout Operating two engines on Succession	Learn about methods for reversing the direction of rotation of induction motors and methods for stopping induction motors.	5	The twentieth
Daily , monthly, and annual	Lectures presented in PowerPoint format	induction motors Monotheism Al-Tur – Types – Its structure is theory Operation – How	Understanding the structure and types of single-phase	5	Al Hady And the twenty

exams		**to Get on determination primary Detailed explanation on Types Engines Single-phase induction -1 Engine The inciter With Al-Tur Split -2 motor The inciter With wide Start 3. Engine The inciter With wide Start The rotation of the engine -4 The inciter With pole shaded -5 engine incompatibility 6 -The engine The year was the opposite direction rotation per type**	**induction motors**		
Daily , monthly, and annual exams	**Lectures presented in PowerPoint format**	**Generators Synchronization Its composition – principles the job – Types Generators with regards to rotating organ coefficient Step – coefficient distribution equation power The pusher Electric in condition Pregnancy**	**Understanding the structure and types of synchronous generators**	**5**	**the second The twentieth**

		)Resistant-- inductive (Saudi(And he drew plans The bull per carry an average to organize Effort – Issues Various			
Daily , monthly, and annual exams	Lectures presented in PowerPoint format	comparison between Generators Current Continuous generators Current Alternating Reasons make Product in Generators Synchronization Steady employment Generators on parallelism Reasons and conditions employment Generators Synchronization In parallel to explain practical Synchronization - rate to organize Effort Various issues	Understanding the difference between DC generators and AC generators	5	the third The twentieth
Daily , monthly, and annual exams	Lectures presented in PowerPoint format	Engines Synchronization - Composition and principles the job in Synchronous motors Start Operation in Engines Synchronization - Engine synchronous in	Understanding the structure and operating principle of synchronous motors	5	The twenty-fourth

		Pregnancy Plan Al-Touri in condition factor capacity Unity – Power factor advanced – factor capacity late account value power electric drive reverse			
Daily , monthly, and annual exams	**Lectures presented in PowerPoint format**	**Uses The process – an average to organize speed engine Shraja – Composition – theory the job – to organize speed review General around engines Current Alternating**	**Understanding the practical uses of alternating current motors**	**5**	**The twenty-fifth**
Daily , monthly, and annual exams	**Lectures presented in PowerPoint format**	**The general engine – its structure, properties, and uses The repulsive engine – its structure, operating theory, properties, and applications**	**Understanding the universal motor and the repulsive motor**	**5**	**The twenty - sixth**
Daily , monthly, and annual exams	**Lectures presented in PowerPoint format**	**Control motors - their types - their structure - their operating theory - the conditions that must be met by control motors - their characteristics**	**Identifying the types and structure of control motors**	**5**	**The twenty-seventh**

		Stepper motors - their construction - applications in which they are used - distinguishing between their types **Theory of operation of stepper motors – Calculating the stepper motor – Writing logical tables for the rotation of the stepper motor in the desired direction**	**Understanding the structure and operating theory of stepper motors**	**5**	**Twenty-eighth**
		Tachometer generators - Types of tachometers and how to distinguish between them - Causes of tachometer reading errors and how to avoid them - How to calibrate tachometers	**Understanding tachometer generators and tachometer types**	**5**	**Twenty-ninth**
		Linear motors – Types of linear motors – Induction linear motors – Problems that arise with linear motors	**Understanding linear motors and their types**	**5**	**thirty**
11. Course evaluation					
First semester exams **Theory –marks 10** **Practical - marks 10** **points – Rating 5**					
Second semester exams					

Theory –marks 10 **Practical - marks 10** **Daily Tests Assessment 5** **Final exam** **degrees – Theory 40** **marks – practical 10**

12. Learning and teaching resources

Textbooks	**Required textbooks (methodology, if applicable(**
References related to the subject and available at the Institute's library	**Main references (sources(**
• **Reference on electrical power transformers / Prof. Dr. Mahmoud Gilani.** • **Practical manual for electrical machines.**	**Recommended supporting books and references (scientific journals, reports(...**
• **MG Say and EO Taylor, Direct Current Machines, Pitman Pub .** • **HC Gerhard Hansberger, Electrical Machines.** • **Stephen J Chapman, "Electric Machinery Fundamentals", McGraw-Hill .** • **PC Sen , Principles of Electrical Machines and Power** • **Electronics, 3rd Edition, 2014 .**	**Electronic references, websites**

description template urse

1. Course Name: Electrical Drawing 2
2. code:
3. Semester/ Year: My semester - First semester/ Second year
4. Date this description was prepared :2025/12/17
5. Available attendance forms : Mandatory daily attendance
6. Total study hours / Total number of units : 3 units
7. Name of the course coordinator (if there is more than one, please mention it.(
Name: M.M. Abbas Fadhil Mohammed
8. Course objectives

1. This course aims to demonstrate the importance of studying engineering and electrical drawing. **2. The student's familiarity with the fundamentals and rules of engineering and electrical drawing, which will benefit him in his specialized studies and life.** **The process.** **3. The student will be able to build his imagination around the subject of drawing.** **4. The student will be able to understand the rules and theories of**	**Course objectives**

engineering. 5. The student is able to achieve speed through alertness, frequent practice ,and following the correct methods. 6. The student uses computer software in engineering and electrical drawing. 7. Understanding electrical symbols and drawing various electrical diagrams	

9. Teaching and learning strategies

1. Creating illustrative three-dimensional shapes. 2. Explanatory film presentation 3. Solve practical exercises for each case 4. ,buildings and their drawing in the program , and almost (Field visits. (5. Drawing electrical circuits in AutoCAD	Strategy

10. Course structure

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Drawing the electrical wiring diagram for a two-story building	Student's ability to use unit applications	3	the first
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Training students in tracing with ink and inking the previous painting	Student's ability to use unit applications	3	the second

Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	A drawing and preparation of the lists of required goods from the markets, their prices, quantities, and units, in order to determine the total cost of the electrical installations for a three-story building. The ground floor contains ten shops, and each floor contains four apartments, each independent of the others, and each apartment contains three rooms with annexes.	Student's ability to use unit applications	3	the third
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Explanation of electrical installations in various locations (laboratories, workshops , public halls (using exposed and buried cables , along with the creation of a diagram illustrating this.	Student's ability to use unit applications	3	Fourth
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Diagram of electrical connections for connecting a three-phase transformer .Δand Y	Student's ability to use unit applications	3	Fifth
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Drawing the electrical wiring diagram for a three-phase Y-connected transformer using Mirza - Bryce connectors.	Student's ability to use unit applications	3	Sixth
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Diagram of the electrical wiring diagram for reversing the direction of rotation of a three-phase induction motor.	Student's ability to use unit applications	3	Seventh

Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Drawing the complete electrical wiring diagram for operating a three-phase electric motor using Mirza - Bryce relays.	Student's ability to use unit applications	3	Eighth
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Drawing of a circuit diagram for a battery charger from a three-phase source	Student's ability to use unit applications	3	Ninth
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	establishment The complete installations of the distribution panel for a three-phase electric current generator whose internal poles are fed with direct current from a small generator mounted along the axis of the original generator. Measurement and protection devices are placed on the drawing.	Student's ability to use unit applications	3	tenth
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	A diagram of the electrical wiring diagram for the compatibility process between a three-phase electric motor and the national electricity company should be drawn, and measuring and protection devices should be placed on the diagram.	Student's ability to use unit applications	3	eleventh
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Study and analysis of electrical maps, electrical map systems, map tracing method – symbols and numbering	Student's ability to use unit applications	3	twelfth
Exercise	Lectures +	Using an electronic	Student's	3	The third,

assessment + midterm and final practical exams	Practical Computer Exercises	calculator in drawing electrical diagrams	ability to use unit applications		fourth , and fifteenth
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Hatching and shading (Hatch, Gradient) and sectors	Student's ability to use unit applications	3	fourteenth
Exercise assessment + midterm and final practical exams	Lectures + Practical Computer Exercises	Layers and controlling their settings.	Student's ability to use unit applications	3	fifteenth

11. Course evaluation

First semester exams

degrees My work first month(20)

marks – Practical (Second month(20)

points – Evaluation 10

Final exam

degrees – practical 50

12. Learning and teaching resources

Textbooks	**Required textbooks (methodology, if applicable(**
References related to the subject and available at the institute's library	**Main references (sources(**
Electrical installation diagrams	**Recommended supporting books and references (scientific journals, reports(...**
The institute's website, various internet	**Electronic references, websites**

resources, and websites of international companies.	

description template ourse

1. Course Name: Electrical Installations 2
2. code : KTED125 -
3. Semester/ Year: Annual (Semester 1 and / (2 Second Year
4. Date this description was prepared: 2025/12/17
5. Available attendance forms : Mandatory daily attendance
6. Total study hours/total units : 120 hours/8 units
7. Name of the course coordinator (if there is more than one, please mention it.(
Name :M.M. Zuhair Ramzi Khalil Al -A .Email : Zuhair.abdujaleel@atu.edu.iq
8. Course objectives

1 - Knowledge of how to use electrical installation tools, power unit components, and devices used in building design such as heating, elevators, lightning arresters, and hazardous areas. 2 -Calculating the voltage drop values in electrical power transmission wires. **.cables and identify faults in them How to choose electrical** **3 -Knowledge of methods for implementing electrical projects, preparin**	**Course objectives**

estimated statements, and bills of quantities.	

9. Teaching and learning strategies

14. Theoretical lectures and practical applications 15. presentations 16. are assessed individually by giving them the opportunity participate in class by answering questions. 17. Students are assessed collectively through daily exams with practical and theoretical questions. 18. Exams for the first and second semesters and final exams for the first and second rounds . 19. Using modern methods to present the theoretical and practical aspects, such as various electronic display devices. To attract the attention and interest of the students so that the idea reaches the student in a better way . 20. Giving students classroom assignments requires the exertion of self-directed skills and interpretations through testing methods. 21. Questioning students through discussion groups by posing intellectual questions such as how, why, when, where , and what r specific topics 22. Using brainstorming and feedback techniques to activate studer accumulated experiences by linking what was learned in previ academic stages to new material. 23. To equip students with practical skills through practi applications .	strategy

10. Course structure

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Live assessmen t + exams	+ Lectures Practical applications	Cables - Cable components and operating voltage,	Understanding the subject of unity	4	the first

		types of cables according to) type insulation MIMPVCTRSVRI and lead- (sheathed paper . cables			
Live assessmen t + exams	+ Lectures Practical applications	laying Cable methods , possible cable faults , how to identify the location type and .of the fault	Understanding the subject of unity	4	the second
Live assessmen t + exams	+ Lectures Practical applications	Protection of electric motors, protection against overcurrent due to short circuits	Understanding the subject of unity	4	the third
Live assessmen t + exams	+ Lectures Practical applications	Protection against due to overcurrents increased load	Understanding the subject of unity	4	Fourth
Live assessmen t + exams	+ Lectures Practical applications	Protection against failure phase loss or and protection against voltage drop	Understanding the subject of unity	4	Fifth
Live assessmen t + exams	+ Lectures Practical applications	Circuit breakers, ,their types (oil sulfur hexafluoride, vacuum, (pneumatic	Understanding the subject of unity	4	Sixth

Live assessmen t + exams	+ Lectures Practical applications	,Substations vertical busbars, pneumatic switchboards, classification of alternating current control boards	Understanding the subject of unity	4	Seventh
Live assessmen t + exams	+ Lectures Practical applications	Lighting, principles of optical engineering, light sources, lighting systems and their types, light measuring devices	understand to topic Unit	4	Eighth
Live assessmen t + exams	+ Lectures Practical applications	Solved questions design on how to and calculate electrical lighting for halls, workshops, and courtyards	Understanding the subject of unity	4	Ninth
Live assessmen t + exams	+ Lectures Practical applications	Grounded and isolated systems: a comparison in case fault, the of advantages and disadvantages of .each system	Understanding the subject of unity	4	Tenth
Live assessmen	+ Lectures Practical	Voltage drop in single-phase and	Understanding the subject of	4	Eleventh

t + exams	applications	three-phase feeders, the meaning of voltage drop, causes of ,voltage drop damage resulting from voltage drop, testing the sizes of cable feeders factors on which) current rates (depend	unity		
Live assessmen t + exams	+ Lectures Practical applications	questions on voltage drop calculations	Understanding the subject of unity	4	the second ten
Live assessmen t + exams	+ Lectures Practical applications	Technical methods of wiring, studying wiring systems, wiring methods, and techniques used for this .purpose	Understanding the subject of unity	4	the third ten
Live assessmen t + exams	+ Lectures Practical applications	Establishing hazardous areas Examples of) hazardous areas) (Establishment In (specifics dangerous places and the	Understanding the subject of unity	4	Fourteenth

		steps that must be taken for that			
Live assessment + exams	+ Lectures Practical applications	Grounding , its installation ,types of ground conductors for substations and buildings, and lightning arresters	Understanding the subject of unity	4	Fifteenth
Live assessment + exams	+ Lectures Practical applications	Definition of electricity consumption and pricing (fixed and variable costs, energy consumption calculation systems , and various .(pricing systems	Understanding the subject of unity	4	Sixteenth
Live assessment + exams	+ Lectures Practical applications	Energy meters, three-phase energy meter, its internal components and common faults, methods of connecting the meter, power factor measuring device, its components and operating theory	Understanding the subject of unity	4	Seventh Ten
Live	+ Lectures	Power factor,	Understanding	4	Eighth

assessmen t + exams	Practical applications	importance of power factor improvement, methods of power factor improvement, examples of solved how to calculate power factor	the subject of unity		Ten
Live assessmen t + exams	+ Lectures Practical applications	Electric heating, general principles , of heat transfer methods of heat transfer, types of heaters , leakage through walls, transfer heat coefficient of materials, thermal insulation , points to consider when calculating spaces and rooms	Understanding the subject of unity	4	Ninth ten
Live assessmen t + exams	+ Lectures Practical applications	Solved examples about heating	Understanding the subject of unity	4	Twenty
Live assessmen t + exams	+ Lectures Practical applications	Electric elevators: choosing the elevator location type, and the and tests that must be	Understanding the subject of unity	4	– Twenty one

		followed when selecting an elevator specific service for a (capacity, required specifications, speed), calculating travel time, elevator efficiency, and type .of service			
Live assessmen t + exams	+ Lectures Practical applications	Types of elevators Passenger and freight elevators : Services (main components of the elevator) - or the operator round The engine The positions The cart Carrying weights The indicators Controllers safety) . (measures	Understanding the subject of unity	4	- Twenty two
Live assessmen t + exams	+ Lectures Practical applications	Construction of the intake engine and .reduction ratio	Understanding the subject of unity	4	third -
Live	+ Lectures	arrest group The	Understanding	4	Fourth

assessment + exams	Practical applications	is signaling system linked to the elevator's ascent .and descent	the subject of unity		And the twenty
Live assessment + exams	+ Lectures Practical applications	Types of motors elevators. used in Specifications Speed regulation for AC and DC motors	Understanding the subject of unity	4	Fifth The twentieth
Live assessment + exams	+ Lectures Practical applications	Safety precautions and friction stop for slippage. elevator Elevator lower and upper springs. .Lighting	Understanding the subject of unity	4	Sixth The twentieth
Live assessment + exams	+ Lectures Practical applications	lightning arresters lightning How strikes and discharges. Specifications for good implementation of lightning arresters Protecting buildings and structures from .strikes lightning	Understanding the subject of unity	4	Twenty-seventh
Live assessment + exams	+ Lectures Practical applications	examples Solved of lightning protection circuit .calculations	Understanding the subject of unity	4	Twenty-eighth

Live assessment + exams	+ Lectures Practical applications	Project implementation methods, tenders and requirements, their tender analysis and the foundations upon which the tender .depends	Understanding the subject of unity	4	Twenty-ninth
Live assessment + exams	+ Lectures Practical applications	Guessing Its types Methods of estimating and the appraising materials needed for a foundation project and the amounts it. required for Factors that affect the cost of .engineering work	Understanding the subject of unity	4	thirty

11. Course evaluation

First semester exams

Theory- marks 10

practical - marks 10

points – Rating 5

Second semester exams

Theory- marks 10

practical - marks 10

-Assessment Daily Tests(5)

Final exam

degrees – Theory 40

practical - marks 10

12. Learning and teaching resources	
Textbooks	(textbooks (methodology, if applicable Required
References related to the subject Institute's and available at the library	(references (sources Main
Electrical wiring of building -1 (by Raphael & Neidle . 2- .Electrical lifts by Rs Philips Practice on low voltage switch -3 .(gears (by Siemense Publication	supporting books and references Recommended (...(scientific journals, reports
The institute's website, various websites of internet resources, and . international companies	references, websites Electronic

Course Description

1. Course Name Arabic language
2. Course code
3. Chapter/Year: Annual / Second Stage
4. Date this description was prepared 17/12/2025

5. Available forms of attendance : My presence
6. Total number of study hours per year / Total number of units2 /
(30)Theory/1 hour per week
7. Name of the course coordinator (if there is more than one, please mention it.(
athmar.turki.4@atu.edu.iq :Email .A -Name: M.M. Athmar Hamza Turki Al
8. Course objectives

After the lecture, the student should be able to: **1. The concept of linguistic errors is known.** **2. It distinguishes between the verb that is connected with the open ta' and the noun that is connected with the closed ta.'** **3. He differentiates between writing the upright alif and the short alif.** **4. It shows the types of medial hamza.** **5. He knows the positions for writing the alif al-wasl and the hamza al-qat.'** **6. It shows the parts of speech.** **7. It identifies the signs of the name.** **8. It distinguishes between nouns, verbs, and particles.** **9. The dual form and what is attached to it are extracted.** **10. It distinguishes between singular, dual, and plural.**	

11. It explains the conditions for the masculine plural. **12. It explains the things that are attached to the masculine plural.** **13. This explains what is meant by the feminine plural.** **14. It specifies what is added to the feminine plural noun.** **15. It mentions dependent elements in the Arabic language.** **16. The concept of emphasis and its benefits are known.** **17. Distinguishing between the two types of emphasis.** **18. He knows the elements of conjunction.** **19. He knows the meanings of conjunctions.** **20. It distinguishes between the adjective and the noun it modifies.** **21. The types of substitutions are mentioned.** **22. The meaning of the five names is known.** **23. It extracts the meaning of the five verbs.** **24. The concept of indefinite and definite is known.** **25. It distinguishes between indefinite and definite nouns.** **26. The subject is distinguished in the sentence.**	

27. He recognizes the signs of the subject being in the nominative case. 28. He knows the basics of the vocative style. 29. The concept of a section is known. 30. It mentions the tools of the section. 31. He knows excellence. 32. It mentions the categories of excellence. 33. The incomplete and shortened name is known. 34. He makes the dual form of the defective and lengthened noun. 35. Correcting the grammatical error in some words.	

9. Teaching and learning strategies	
The method of delivering the lecture. Method of discussion. A method for discovering errors. Allocate a percentage of the grade to daily assignments and tests.	Strategy

1. Course structure :					
Evaluation Method	Teaching method	Unit/Topic Name	Required learning outcomes	Hours	Week
tests Daily and oral questions	Theoretical lecture	concept of linguistic The errors / The closed and open "taa"	Cognitive understanding	1	First and second
tests Daily	Theoretical	long alif and the short alif The	Cognitive	2	the third

and oral questions	lecture		understanding		
tests Daily and oral questions	Theoretical lecture	al-Wasl Hamzat	Cognitive understanding	2	Fourth
tests Daily and oral questions	Theoretical lecture	hamza medial hamza and the final letter The	Understanding cognitive	3	Fifth, sixth, and seventh
tests Daily and oral questions	Theoretical lecture	.word/parts of speech The	Cognitive understanding	2	The ninth and tenth
tests Daily and oral questions	Theoretical lecture	dual and that which is The .attached to the dual	Cognitive understanding	1	Tenth
tests Daily and oral questions	Theoretical lecture	plural, masculine Feminine plural	Cognitive understanding	2	Eleventh-twelfth
tests Daily and oral questions	Theoretical lecture	elements: Dependent emphasis, conjunction	Cognitive understanding	2	Thirteenth-Fourteenth
tests Daily and oral questions	Theoretical lecture	substitute ,Adjective	Cognitive understanding	2	Fifteenth and sixteenth
tests Daily and oral questions	Theoretical lecture	and definite Indefinite	Cognitive understanding	2	Sixteenth and seventeenth
tests Daily and oral	Theoretical lecture	of the oath Letters	Cognitive understanding	2	eighteenth

questions					
tests Daily and oral questions	Theoretical lecture	Five Names The	Cognitive understanding	1	nineteenth
tests Daily and oral questions	Theoretical lecture	call The	Cognitive understanding	1	Twenty
tests Daily and oral questions	Theoretical lecture	actor	Cognitive understanding	1	Twenty-first
Daily tests and oral questions	Theoretical lecture	and definite Indefinite	Cognitive understanding	2	Twenty-second The twenty-third
tests Daily and oral questions	Theoretical lecture	Five Verbs The	Cognitive understanding	1	Twenty-fourth
tests Daily and oral questions	Theoretical lecture	noun and lengthened Defective noun	Cognitive understanding	1	Twenty-fifth
tests Daily and oral questions	Theoretical lecture	Excellence	Cognitive understanding	2	Twenty-sixth - Twenty-seventh
tests Daily and oral questions	Theoretical lecture	grammar errors Common apps	Cognitive understanding	4	Twenty-eighth, twenty-ninth Thirty

1. Course evaluation	
student, such as grade out of 100 is distributed according to the tasks assigned to the The .reports, etc ,daily preparation, daily, oral, monthly, and written exams	
2. Learning and teaching resources	
Methodological course	**equired textbooks (methodology, if applicable**
Grammar: Khaled Abdel Aziz, Applied .2018-2019 edition language for the second intermediate Arabic .grade: Fatima Nazim, 2018 edition	**(references (sources Main**
-	**Recommended supporting books and (...scientific journals, reports) references**
websites Specialized	**references, websites Electronic**

Course description template

1. Course Name
Crimes of the Ba'ath regime in Iraq
2. Course code
3. Semester/Year
Annual system
4. Date this description was prepared
17/12/2025
5. Available forms of attendance
Weekly

6. Total number of study hours, total number of units ,total number of units
30 hours / 2 hours
7. Name of the course coordinator (if there is more than one, please mention it.(
Name :Talal Mudhaffar Ghazi Al -A .Email :talal.almasuode@atu.edu.iq
8. Course objectives

Course objectives	
1- enabling the student to understand the crimes of the Ba'ath regime according to documented laws of the Iraqi Supreme Court in 2005	
2- enabling the student to understand the crimes types of international	
3- enabling the student to know about violations of Iraqi laws.	

9. Teaching and learning strategies	
1. Explanation 2. Brainstorming 3. Dialogue and discussion 4. Using references and sources 5. Using modern teaching methods	Strategy

10. Course structure

Week	Hours	Required learning outcomes	Unit or topic name	Learning method	Evaluation Method
the first	2	and ,skill-based emotional domains	The concept of crimes and their categories.	Lecture and discussion	oral test
the second	2	and ,skill-based emotional domains	Definition of crime, both linguistically	a lecture	oral test

		.technically and			
oral test Written test	a lecture discussion	.Crime departments Categories and types of crimes committed by the Ba'ath regime	and ,skill-based emotional domains	2 2	the third Fourth
oral test	a lecture	Crimes of the Ba'ath regime, as documented by the Iraqi High Criminal Court Law of ...2005	and ,skill-based emotional domains	2	Fifth
oral test	a lecture	International .crimes	and ,skill-based emotional domains	2	Sixth
oral test	a lecture	Types of international .crimes	and ,skill-based emotional domains	2	Seventh
oral test	a lecture	Decisions issued by the Supreme .Criminal Court	and ,skill-based emotional domains	2	Eighth
oral test	a lecture	Psychological and social crimes and and the ,their effects most prominent violations of the Ba'athist regime in Iraq	and ,skill-based emotional domains	2	Ninth
Written test	discussion	Psychological crimes	and ,skill-based emotional domains	2	tenth

oral test	a lecture	Mechanisms of psychological .crimes	and ,skill-based emotional domains	2	atheistic ten
oral test	discussion	Psychological effects of crimes	and ,skill-based emotional domains	2	twelfth
oral test	a lecture	social crimes	and ,skill-based emotional domains	2	the third Ten
oral test	a lecture	militarization of society	and ,skill-based emotional domains	2	Fourth ten
oral test	a lecture	The Ba'athist regime's stance on religion	and ,skill-based emotional domains	2	Fifth ten
Written test	discussion	Violations of Iraqi .laws	and ,skill-based emotional domains	2	Sixth ten
oral test	a lecture	Images of human rights abuses and .crimes of power .	and ,skill-based emotional domains		Seventh Ten
oral test	discussion	Some decisions regarding the political and violations military	and ,skill-based emotional domains	2	Eighth ten

		of the Ba'ath .regime			
oral test	a lecture	Prisons and detention centers of the Ba'ath regime	and ,skill-based emotional domains	2	Ninth ten
oral test	a lecture	Environmental crimes of the Ba'ath regime in Iraq	and ,skill-based emotional domains	2	Twenty
oral test	a lecture	War and radioactive pollution and mine .explosions	and ,skill-based emotional domains	2	venty-first
Written test	discussion	The destruction of cities and villages is earth a scorched .policy	and ,skill-based emotional domains	2	he second and Twenty
oral test	a lecture	Draining the .marshes	and ,skill-based emotional domains	2	Twenty-third
oral test	discussion	The bulldozing of palm groves, trees, .and crops	and ,skill-based emotional domains	2	Twenty-fourth
oral test	a lecture	.Mass grave crimes	and ,skill-based emotional domains	2	venty-fifth
oral test	a lecture	Events of the mass graves of genocide the committed by Ba'athist regime in Iraq	and ,skill-based emotional domains	2	Twenty-sixth

oral test	a lecture	Chronological classification of genocide graves in Iraq for the period 1963-2003	and ,skill-based emotional domains	2	Twenty-seventh
oral test	discussion	cemetery sites in Iraq	and ,skill-based emotional domains	2	Twenty-eighth
Written test	a lecture	Preparation and distribution of graves in Iraq	and ,skill-based emotional domains	2	Twenty-ninth
oral test	a lecture	Database of martyrs of mass graves	and ,skill-based emotional domains	2	Thirty

11. Course evaluation

the student, such as The grade out of 100 is distributed according to the tasks assigned to .exams, reports, etc daily preparation, daily, oral, monthly, and written

marks for the monthly exam 40

marks for daily preparation, oral presentations, and report writing 10

marks final exam 50

12. Learning and teaching resources

Crimes of the Ba'ath regime in Iraq	extbooks (methodology, if applicable Required
Local Governments / Dr. Farah Diaa	(references (sources Main
research Scientific journals, periodicals, and	supporting books and Recommended (...references (scientific journals, reports
dia Internet sites (YouTube and Google) and Communication in the field	references, websites Electronic