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

Academic Program Guide

2025-2026

University name: Anbar University
College name: Engineering
Scientific Department: Electrical Engineering
Academic or Professional Program Name: Bachelor's degree in electrical engineering
Final Certificate Name: Bachelor of Science in Electrical Engineering
Academic System: courses
Description Preparation Date: 14/10/2025
File Filling date: 14/10/2025

Signature:
Dr. Manth Awan Mahmoud
Head of Department
Date: 21/10/2025

Signature:
Dr. Mohammed Abdul Ahmed
Scientific Associate
Date: 21/10/2025

The File is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department
Dr. Haitham Kamil Daud
Date: 21/10/2025
Signature:

Approved by Dean
Prof. Dr. Ameer Abdel Rahman Hilal

1. Program Vision

[illegible]

2. Program Mission

[illegible]

3. Program Objectives

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

4. Program Accreditation

N/A

5. Other external influences

N/A

6. Program Structure

Program Structure	Number of Courses	Credit hours (Please Cal)	Percentage	[illegible]
Institution Requirements	10	22	[illegible]	
College Requirements	[illegible]	[illegible]	[illegible]	
Department Requirements	[illegible]	[illegible]	[illegible]	
Department Electives	3	6	4%	
Other				

* [illegible]

7. Program Description			Hours and Units Credit	
Year/Level	Course Code	Course Name	theoretical	experimental
1	UOA001	Arabic Language	2	0
1	ENG003	Calculus I	3	0
1	ENG004	Calculus II	3	0
1	ENG007	Chemistry	2	2
1	UOA007	Computer Science	1	2
1	EIE301	Digital Techniques I	2	2
1	ENG002	Engineering Drawing	2	2
1	ENG006	Engineering Mechanics (Static)	3	0
1	UOA003	English Language	2	0
1	ENG005	Fundamentals of Electrical Engineering I	3	2
1	EIE302	Fundamentals of Electrical Engineering II	3	2
1	UOA005	Human Rights and Democracy	2	0
1	ENG001	Physics	3	2
2	ENG008	Calculus III	3	0
2	ENG009	Calculus IV	3	0
2	UOA008	Computer Science II	1	2
2	UOA006	Crimes of the Baath Regime in Iraq	2	0
2	EIE315	DC Machines I	2	2
2	EIE316	DC Machines II	2	2
2	EIE340	Digital Techniques II	3	0
2	EIE305	Electric Circuits I	3	0
2	EIE306	Electric Circuits II	3	2
2	EIE303	Electromagnetic Fields I	2	0
2	EIE304	Electromagnetic Fields II	2	0
2	ENG010	Engineering Statistics	2	0
2	EIE307	Fundamentals of Electronics I	2	2
2	EIE308	Fundamentals of Electronics II	2	2
3	EIE317	AC Machines I	2	2
3	EIE318	AC Machines II	2	2
3	EIE323	Analog Communications and Noise	2	0
3	UOA002	Arabic Language II	2	0
3	EIE320	Computer Networks	2	0
3	EIE319	Computer Programming	1	2
3	EIE324	Digital Communications	2	2
3	EIE321	Electric Power I	2	0
3	EIE322	Electric Power II	2	0
3	EIE309	Electronics I	2	2
3	EIE310	Electronics II	2	2
3	EIE311	Engineering Analysis I	3	0

7. Program Description

Year / Level	Course code	Course name	Hours and units Credit	
			Theoretical	Experimental
4	EE4012	Engineering Analysis II	3	.0
3	GSA004	English Language II	2	0
4	EE4355	Advanced Communication Systems	2	--
4	EE4331	Control Theory I	2	--
4	EE4332	Control Theory II	2	--
4	EE4330	EE Lab 3	--	2
4	EE4341	EE Lab 4	--	2
4	EE4335	Digital Power II	2	--
4	EE4312	Engineering Numerical Methods	2	2
4	EE4327	English Language II	2	--
4	EE4340	Fiber Optics Communications	2	--
4	EE4339	Final Year Project I	3	--
4	EE4331	Final Year Project II	3	--
4	EE4314	Information Theory	2	--
4	EE4308	Management and Leadership Skills	2	--
4	EE4317	Power Electronics	2	--
4	EE4306	Power System Analysis	2	--
4	EE4345	Programmable Logic Controller (PLC)	2	--

8. Expected learning outcomes of the program

Knowledge	
The ability to understand the fundamental of electrical engineering (Physics, Mathematics, and Electrical Circuits)	Communication: Designing and analyzing digital and analog electronic circuits.
Control Systems: Understanding and applying control theories in automation processes.	Power Systems: Studying the generation, transmission, and distribution of electrical power, as well as energy efficiency.
Communications: Studying theories and principles of wired and wireless communications.	Computer Programming: Skills and applying techniques to solve engineering problems.
Skills	
Problem-Solving: The ability to identify complex engineering problems and develop innovative solutions.	Design: Designing electronic circuits, electrical systems, and electronic products.
Modeling and Simulation: Using computer software to	Measurement and Testing: Conducting experiments and measuring performance in controlled environments.

[illegible]	
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

9. Teaching and Learning Strategies

[illegible]

10. Evaluation methods

[illegible]

- Lab Reports: Assess the ability to conduct experiments, analyze results, and write scientific reports.
- Individual and Group Projects: Measure the ability to work independently and collaboratively to solve complex engineering problems.

3. Projects
- Design Projects: Evaluate the ability to design and implement electrical circuits and electronic systems.
- Research Projects: Assess the capacity to conduct scientific research and present findings.
- Capstone Projects: Evaluate the ability to apply acquired knowledge and skills to solve real-world engineering problems.

4. Presentations
- Oral Presentations: Assess effective communication skills and the ability to present information clearly and persuasively.
- Poster Presentations: Evaluate the ability to summarize complex information in a concise and visually appealing format.

5. Continuous Assessment
- Participation in Discussion Sessions: Evaluate active participation in discussions and the exchange of ideas.
- Regular Attendance at Lectures: Assess commitment and discipline.

11 Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer
Assistant Professor	[illegible]	Material Science		1	
Assistant Professor	Electrical Engineering	Communications		2	
Assistant Professor	Electrical Engineering	Control		2	
Assistant Professor	Electrical Engineering	Power		1	
Assistant Professor	Physics	[illegible]		1	
Lecturer	Electrical Engineering	Communications		1	
Lecturer	Computer Engineering	Computer		1	
Lecturer	Electrical Engineering	Electronics		1	

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if Applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer
Lecturer	Control Engineering	Power		1	
Lecturer	Electrical Engineering	Power		1	
Lecturer	Electrical Engineering	Control		1	
Lecturer	Computer Engineering	artificial [illegible]		1	
Lecturer	Control Engineering	Instrumentation		1	
Assistant lecturer	Electrical Engineering	Communication		1	
Assistant lecturer	Computer Engineering	Computer		2	
Assistant lecturer	Electrical Engineering	Electronics		1	
Assistant lecturer	Electrical Engineering	Power		2	

12. Professional Development

Mentoring new faculty members

- Training and Development Programs: Organizing workshops and seminars on the latest advancements in electrical engineering and effective teaching methods.
- Encouraging Further Studies: Motivating new faculty members to pursue higher education and obtain a PhD degree.
- Research Opportunities: Providing new faculty members with opportunities to work in advanced research projects.
- Conference Participation: Supporting participation in local and international conferences and seminars to present research and exchange expertise.
- Publishing Research Papers: Encouraging the submission and publication of research papers in peer-reviewed scientific journals.
- Training on Modern Educational Technologies: Providing training on using modern teaching techniques, such as project-based learning and collaborative learning.
- Performance Evaluation: Conducting faculty members [illegible] periodically [illegible] performance and develop individual improvement plans.

Professional development of faculty members

- Opportunities in Advanced Research Centers: Providing new faculty members with opportunities to work in advanced research centers.
- Support for Conference Participation: Encouraging participation in local and international conferences and seminars to present research and exchange expertise.
- Promoting Research Publication: Motivating faculty members to conduct and publish research papers in peer-reviewed scientific journals.
- Training on Modern Educational Technologies: Offering training for the use of modern teaching techniques, with a focus on interactive methods such as project-based learning and collaborative learning.
- Regular Performance Evaluation: Encouraging faculty members to periodically evaluate their performance and develop individual improvement plans.

13. Acceptance Criterion

Central Admission by the Ministry of Higher Education and Scientific Research.

14. The most important sources of information about the program

- College Website:
[illegible]
- Department Website and Email:
[illegible]
- Scientific Guide for the Department: (Curriculum for Electrical Engineering (2022)) [illegible]

15. Program Development Plan

Curriculum Updates:
- Establishing Specialized Committees: Regularly reviewing and updating curricula.
- Incorporating Elective Courses: Introducing electives aligned with students' interests and future trends.
- Adopting Modern Teaching Methods: Implementing active learning and collaborative learning strategies.

Enhancing Infrastructure:
- Upgrading Laboratories: Providing the latest devices and equipment to labs.
- Multimedia Lecture Halls: Ensuring availability of multimedia-equipped classrooms.
- Digital Laboratory Workshops: Establishing workshops with digital manufacturing tools.

Research Program Development:
- Encouraging Student Participation: Motivating students to engage in research programs.
- Providing Financial and Logistical Support: Supporting researchers to facilitate their work.
- Publishing Research: Promoting the dissemination of research findings in scientific conferences and peer-reviewed journals.

Building Strategic Partnerships:
- Collaborative Workshops and Seminars: Organizing joint events with local and international institutions.
- Experience Exchange: Collaborating with counterpart departments in Iraqi, Arab, and international universities, including inviting visiting professors.

Human Resource Development
- Challenges Training Program (HRDTP) ongoing training for faculty members.
- Promoting Graduate Degree Encouraging faculty members to pursue higher academic qualifications.
- Industry Experts Inviting professionals from the industry to teach specialized courses.

Performance Indicators
- Increase Enrollment Growth in the number of students registering for the program.
- Improve Graduation Rates Enhancing the percentage of students completing the program successfully.
- Higher Employability Increasing the number of graduates working in chemical engineering fields.
- Research Output Boosting the number of published research papers in peer-reviewed journals.
- International Recognition Achieving global recognition and accreditation for the program.

16. Program Skills Outline

Program Description			Credit Hours and units			PEO							Domain		
Year / Level	Course Code	Course Name	Theoretical	Practical	Required / Optional	I	II	III	IV	V	VI	VII	Knowledge	Skills	Ethics
1	ENG005	Calculus I	3	-	R	X	-		-	-		-	X		
1	ENG008	Calculus II	3	-	R	X	-		-	-	-	-	X		
1	ENG001	Chemistry	3	1	R	X	-	X	-	-	-	-	X	X	
1	ENG007	Drawing Engineering	3	1	R	X				-	X	X	X	X	
1	ENG006	Mechanics (Static) Engineering	3	-	R	X	-	-	-	-	-	-	X		
1	ENG003	of Electrical Fundamentals Engineering I	3	1	R	X	-	X	-	-	-	-	X	X	
1	ENG002	Physics	3	1	R	X	-	X	-	-	-	-	X	X	
1	ELE002	Techniques I Digital	3	1	R	-	X	X	-			-	X	X	
1	ELE001	of Electrical Fundamentals Engineering II	3	1	R	X		X	-			-	X	X	
1	UOA001	Language Arabic	3		R	-			X	-	-	-		X	X
1	UOA007	Science Computer	3	1	R	X				-	X	X	X	X	
1	UOA003	Language English	3	-	R	-	-	-	X	-	-	-		X	X
1	UOA002	and Democracy Human Rights	3	-	R	-	-	-	-	X	-	-			X
2	ENG009	Calculus III	3	-	R	X			-	-	-	-	X		
2	ENG010	Calculus IV	3	-	R	X	-	-	-	-	-	-	X		
2	ENG011	Statistics Engineering	3	-	R	X	-		-	X	-	-	X		X
2	ELE015	DC Machines I	3	1	R	X		X			-	-	X	X	
2	ELE016	DC Machines II	3	1	R	X		X					X	X	
2	ELE040	Techniques II Digital	3	-	R		X	X	-	-	-	-	X	X	
2	ELE003	Circuits I Electronic	3	-	R	-	X	-	-	-	-	-	X		

Program Description			Credit hours and units			PLO							Domain		
Year level	Course code	Course name	Theoretical	Experimental	Required / Elective	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Knowledge	Skills	Ethics
2	ELE004	Circuits II Electric	3	-	X	-	X	-	-	-	-	-	X		
2	ELE005	Fields I Electromagnetic	3	-	X	X	X	-	-	-	-	-	X		
2	ELE006	Fields II Electromagnetic	3	-	X	X	X	-	-	-	-	-	X		
2	ELE007	of Electronics I Fundamentals	3	1	X	X	X	-	-	-	-	-	X		
2	ELE008	of Electronics II Fundamentals	3	1	X	X	X	-	-	-	-	-	X		
2	UOA006	Science II Computer	1	1	X	X	-	-	-	-	X	X	X	X	
2	UOA005	Baath Regime in Crimes of the [illegible]	2	-	X	-				X		-			X
3	ELE017	AC Machines I	3	1	X	X	X			-	-	-	X		
3	ELE018	II AC Machines	3	1	X	X	X		-	-	-	-	X		
3	ELE013	Communications and Analog Noise	3	-	X	-	X	-	-	-	-	-	X		
3	ELE020	Network Computer	3	-	X	-	X	-	-	-	-	-	X		
3	ELE019	Programming Computer	2	1	X	-	X	-	-	-	-	-	X		
3	ELE014	Communications Digital	3	1	X		X				-	-	X		
3	ELE021	Power I Electric	3	-	X		X						X		
3	ELE022	Power II Electric	3	-	X	-	X	-	-	-	-	-	X		
3	ELE009	Electronics I	3	1	X	X	X		-				X		
3	ELE010	II Electronics	3	1	X	X	X		-				X		
3	ELE011	Analysis I Engineering	3		X	X							X		
3	ELE012	Analysis II Engineering	3	-	X	X							X		
1	UOA003	Language II Arabic	2	-	X	-	-	-	X	-	-	-		X	X
1	UOA004	Language II English	2	-	X	-		-	X	-	-	-		X	X

Program Description			Credit Hours and Units			PEO							Domain		
Year Level	Course Code	Course Name	Theoretical	Experimental	Required / Elective	i	ii	iii	iv	v	vi	vii	Knowledge	Skills	Ethics
[illegible]	EE3311	Numerical Engineering Methods	[illegible]	[illegible]	[illegible]	X						X	X	X	
[illegible]	[illegible]	Communications Fiber Optics	[illegible]		[illegible]		X						X		
[illegible]	[illegible]	Analysis Power System	[illegible]		[illegible]		X						X		
[illegible]	[illegible]	Logic Controller Programmable (PLC)	[illegible]		[illegible]		X						X		
[illegible]	[illegible]	Communications Advanced Systems	[illegible]		[illegible]		X						X		
[illegible]	[illegible]	Theory I Control	[illegible]		[illegible]		X						X		
[illegible]	[illegible]	Theory II Control	[illegible]		[illegible]		X						X		
[illegible]	[illegible]	Power III Electric	[illegible]		[illegible]	X	X						X		
[illegible]	[illegible]	Project I Final Year	[illegible]		[illegible]	X	X	X	X	X	X	X	X	X	X
[illegible]	[illegible]	Project II Final Year	[illegible]		[illegible]	X	X	X	X	X	X	X	X	X	X
[illegible]	[illegible]	Theory Information	[illegible]		[illegible]		X						X		
[illegible]	[illegible]	Electronics Power	[illegible]		[illegible]		X						X		
[illegible]	[illegible]	EE Lab 41		[illegible]	[illegible]			X	X			X		X	X
[illegible]	[illegible]	EE Lab 42		[illegible]	[illegible]			X	X			X		X	X
[illegible]	[illegible]	and Leadership Management Skills	[illegible]		[illegible]				X	X	X	X		X	X
[illegible]	[illegible]	Language IV English	[illegible]		[illegible]				X					X	X

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Physics			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENG001				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	UG1	Semester of Delivery	1		
Administering Department	Electrical	College	College of Engineering		
Module Leader	Ehsan H. Sabbar	e-mail	Ehsan.sabbar@uoanbar.edu.iq		
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.		
Module Tutor		e-mail			
Peer Reviewer Name		e-mail			
Scientific Committee Approval Date	30/0ct/2023	Version Number	1.0		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Introduce fundamental concepts in physics. 2. Develop mathematical skills for problem-solving. 3. Cover mechanics, oscillations, and waves. 4. Introduce thermodynamics and fluid mechanics. 5. Explore electric and magnetic fields. 6. Cover basic principles of optics. 7. Develop practical laboratory skills. 8. Apply physics principles to engineering contexts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand fundamental physics concepts. 2. Apply mathematics to solve physics problems. 3. Analyze motion, forces, and energy in engineering contexts. 4. Interpret oscillations and waves in engineering applications. 5. Apply thermodynamics and fluid mechanics to engineering problems. 6. Apply electric and magnetic field principles in engineering scenarios. 7. Explain optical phenomena and apply basic optics principles. 8. Conduct experiments, analyze data, and communicate findings. 9. Apply physics principles to address engineering challenges. 10. Make informed engineering decisions using physics knowledge.
Indicative Contents المحتويات الإرشادية	1. Introduction to Physics and Measurement. 2. Mechanics: Motion, Forces, and Energy. 3. Oscillations and Waves. 4. Thermodynamics. 5. Fluid Mechanics. 6. Electric and Magnetic Fields. 7. Optics. 8. Laboratory Sessions. 9. Engineering Applications.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3

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	3	10% (10)	5, 10	LO#1, 2, 3
	Assignments	2	5% (5)	2, 12	LO#1, 2
	Projects / Lab.	1	10% (10)		LO#1, 9,7
	Report	1			LO#1, 2,5
Summative assessment	Midterm Exam	2hr	15% (15)	8	
	Final Exam	3hr	60% (60)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Physics and measurement; Kinematics of motion of a single particle in one and two dimensions; Kinematics of projectile and circular motion.
Week 2	Dynamics of motion of a single particle and multiple objects in one and two dimensions and Newton's Laws; Free body diagrams; various types of mechanical forces; Application on the use of Newton's Laws
Week 3	Work and energy; Conservative systems and the concept of potential energy; Conservation of mechanical energy
Week 4	System of particles; Linear momentum; Conservation of linear momentum and collisions; Elastic and Inelastic collisions; Center of mass.
Week 5	Kinematics and Dynamics of rotational motion; Torque; Moment of inertia; Angular momentum; Static equilibrium of rigid bodies; Elasticity and concepts of stress and strain
Week 6	Phases of matter; Pressure and density, Equations of Fluid static; Equations of fluid dynamics: Continuity and Bernoulli's equations.
Week 7	Oscillating systems; Simple Harmonic Motion (SHM); Energy of SHM; Damped oscillations; Forced oscillations and Resonance.
Week 8	Midterm Exam
Week 9	Types of waves: Transverse and Longitudinal; Traveling waves; Wave speed; The wave equation; Power and intensity in wave motion;
Week 10	Examples & Problems
Week 11	Reflection and transmission of wave; The principle of superposition; Interference of waves; Standing waves; Resonance
Week 12	Macroscopic and microscopic description of matter;
Week 13	Measuring temperature; Thermal expansion.
Week 14	Concept of temperature and thermal equilibrium (zeroth law of thermodynamics)
Week 15	Measuring temperature; Thermal expansion.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Measurements and Data Analysis
Week 1	LAB1: Analyzing the kinematic components of 1Dmotion by using motion sensor
Week 2	LAB2: Determination of the Acceleration of Gravity by studying Free fall
Week 3	LAB3: Verification of Newton's Second Law
Week 4	LAB4: Frequency Modulation
Week 5	LAB5: Conservation of mechanical energy
Week 6	LAB6: Verification of Work – energy theorem
Week 7	LAB7: Static Equilibrium of a rigid object
Week 8	LAB8: Determination of the Acceleration of Gravity using the Simple Pendulum

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• R.D. Knight, Physics for Scientists and Engineers, 2nd ed., Pearson 2008 Laboratory Manual, Compiled by Instructor	No
Recommended Texts	*University Physics* , William Moebs, Formerly of Loyola Marymount University Samuel J. Ling, Truman State University Jeff Sanny, Loyola Marymount University	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Calculus I			**Module Delivery**	
Module Type	B			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENG003				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		1	**Semester of Delivery**		1
Administering Department		Electrical	**College**	College of Engineering	
Module Leader	Yasameen Kamil Najm		**e-mail**	yknajm@uoanbar.edu.iq	
Module Leader's Acad. Title		Lecture	**Module Leader's Qualification**		MSc.
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		24/09/2025	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This course aims to provide the student with the skill of dealing with mathematical equations, clarifying the concept of differentiation and integration, and the polar, Cartesian, and cylindrical coordinates. 2. Demonstrate methods for solving integrals and sequences and series. 3. The course aims to study the applications of integration in calculating the lengths of curves, areas, and volumes in different coordinates and some physical applications. 4. The course aims to give the student a new background that he can benefit from when studying differential equations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To develop mathematical skill so that students are able to sketch the graph of various functions and evaluate Limits by using different techniques including L'Hopital's Rule. 2. Apply mathematical methods and principles in solving various derivative problems from Engineering fields, involving applications of derivatives. 3. Demonstrate algebraic facility with algebraic topics including linear, quadratic, exponential, logarithmic, and trigonometric functions, 4. Compute derivative and anti-derivative of algebraic, trigonometric, inverse trigonometric, exponential, logarithmic, and apply them to solve problems in a wide range of engineering applications.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Functions 2. Limits 3. Differentiation rules 4. The Chain Rule, implicit Differentiation 5. Applications of differentiation 6. Exponential and logarithmic functions. 7. Trigonometric functions and their derivatives 8. Hyperbolic functions and their derivatives 9. Advanced Applications of differentiation 10. Derivative and anti-derivative functions

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 type of simple experiments involving some sampling activities that are interesting to the students.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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**	5	25% (25)	5, 10	LO#1, 2 and 3
	Assignments	2	10% (10)	2, 12	LO#1, and 4
	Projects / Lab.				
	Report	1	5%	13	LO#4
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO#1,2 and 3
	Final Exam	3hr	50% (50)	16	LO#1,2,3 and 4
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Functions
Week 2	Functions
Week 3	Limits
Week 4	Limits
Week 5	Differentiation rules
Week 6	Differentiation rules
Week 7	The Chain Rule, implicit Differentiation
Week 8	Applications of differentiation
Week 9	Applications of differentiation
Week 10	Exponential and logarithmic functions

Week 11	Trigonometric functions and their derivatives
Week 12	Hyperbolic functions and their derivatives
Week 13	Advanced Applications of differentiation
Week 14	Derivative and anti-derivative functions
Week 15	Derivative and anti-derivative functions
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Stewart, J., Clegg, D. K., & Watson, S. (2020). Calculus: early transcendental. Cengage Learning	
Recommended Texts	Thomas, G. B., Haas, J., Heil, C., & Weir, M. (2018). Thomas' Calculus. Pearson Education Limited. Stroud, K. A., & Booth, D. J. (2020). Engineering mathematics. Bloomsbury Publishing.	
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Drawing			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENG007				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		Semester of Delivery	1	
Administering Department	Electrical		College	College of Engineering	
Module Leader	Zainab najeeb		e-mail	@uoanbar.edu.iq	
Module Leader's Acad. Title	Mr.		Module Leader's Qualification	Ms.C	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date	30/nov/2025		Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course discusses the basic concepts of engineering drawings. It also provides an introduction to the AutoCAD software and covers
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define and interface of designing. 2. Define and interface of AutoCAD. 3. Draw with aide of AutoCAD .
Indicative Contents المحتويات الإرشادية	● Make the student able to draw and complete designs for electrical works8. Describe the principles of 10. ● Giving exercises related to the topic and various electrical works. ● Define and interface of designing. ● Define and interface of AutoCAD. ● Draw with aide of AutoCAD .

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	92	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	58	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO#1,2 and 3
	Assignments	2	5% (5)	2, 12	LO#2, 3
	Projects / Lab.	1	10% (10)		LO# 3
	Report	1			LO# 3
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO# 2 and 3
	Final Exam	3hr	60% (60)	16	LO#1,2 and 3
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Starting AutoCAD, Units
Week 2	, Units, features overview
Week 3	AutoCAD basics, commands
Week 4	commands, the status bar
Week 5	coordinate system, and zooming
Week 6	Layers: creation, properties
Week 7	management, setting line weights.
Week 8	Objects commands. program help
Week 9	point, line, dimensions, circle
Week 10	rectangle, arc, ellipse, polygon
Week 11	donut, hatch, construction line, poly line, text.
Week 12	Modify commands. erase, copy,
Week 13	copy, move, offset, mirror, trim, extend
Week 14	break, rotate, scale, lengthen, stretch, fillet, chamfer, array, explode
Week 15	Examples of electrical project.
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?

Required Texts	Autodesk, “AutoCAD 2015: Complete Guide to What’s New”, 2015	No
Recommended Texts	.	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Fundamentals of Electrical Engineering I			Module Delivery	
Module Type	C			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENG005				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UG1	Semester of Delivery		1
Administering Department		Electrical	College	College of Engineering	
Module Leader	thaker Mahmood Nayl		e-mail	thaker.nayl@uoanbar.edu.iq	
Module Leader's Acad. Title		Assist. Prof	Module Leader's Qualification		PhD
Module Tutor	Sameh Jassam Mohammed		e-mail	samehjassam@uoanbar.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		30/nov/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current
Indicative Contents المحتويات الإرشادية	DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff’s laws and Ohm’s law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO#1,2,3,7,9 and 11
	Assignments	2	5% (5)	2, 12	LO#2,5 and 8
	Projects / Lab.	1	10% (10)		LO#2,5 and 8
	Report	1			LO#10 and 11
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO#1to 9
	Final Exam	3hr	60% (60)	16	LO#2,to 11
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction - Difference between Circuit Theory and Field Theory
Week 2	Basics of Network Elements
Week 3	Charge, Current and Voltage
Week 4	Power and Energy
Week 5	Resistance and Resistivity and Ohm's Law
Week 6	Kirchhoff's Laws
Week 7	Series Resistors and Voltage Division
Week 8	Parallel Resistors and Current Division
Week 9	Midterm Exam 1
Week 10	Wye-Delta Transformations
Week 11	Circuit Analysis - Nodal and Mesh
Week 12	Linearity and Superposition
Week 13	Source Transformations
Week 14	Thévenin and Norton Equivalents
Week 15	Maximum Power Transfer
Week 16	Midterm Exam 2

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	Lab 1: Equipment Familiarization
Week 2	Lab 2: Ohm's Law

Week 3	Lab 3: Kirchhoff's Laws
Week 4	Lab 4: Series Resistors and Voltage Division
Week 5	Lab 5: Parallel Resistors and Current Division
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Human Rights & Democracy**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOA005**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		1	**Semester of Delivery**		1
Administering Department			**College**		
Module Leader	Muanna w naji		**e-mail**	muanna.naji@uoanbar.edu.iq	
Module Leader's Acad. Title		Assistant Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		01/11/2025	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is designed to give the student a definition of human rights and democracy idiomatically, the legitimacy of the origin of the right in the view of Islamic law, the pillars of the right and its types, personal freedom, intellectual freedom, economic rights and freedoms, Islam and slavery, the goals of human rights, the use of freedom and the general legitimate right, the right of a Muslim to His Muslim brother, the rights of parents, the right neighbor, the right of women, human rights in the divine religions, religious tolerance in Islam. thinking skills 1. Work on developing the intellectual property of the student. 2. Ensuring the student's personal development at the academic level. 3. Drawing ways of intellectual success to achieve personality building on the (family, social, academic, and professional) levels. 4. Learn the art of dealing with the above character building levels.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. 1. Explain the concept of "human rights and democracy" 2. 2. The status of human rights and freedoms in Islam 3. 3. Define and describe the relationship between human rights and democracy
Indicative Contents المحتويات الإرشادية	**Course Topics:** 1. Introducing human rights, democracy and the principle of freedoms. [Two hours] 2. The origin of right and freedom from the point of view of Islamic law, and the general concept. [3 hours] 3. Elements and types of human rights and freedoms. [8 hours] 4. Economic and political rights and freedoms. [3 hours] 5. Islam and slavery. [1 hour] 6. The objectives of human rights and democracy. [4 hours] 7. The project of using freedom and public right. [2 hours] 8. The right of a Muslim and humanity. [2 hours]

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Raise the intellectual level of students, which is the importance of human rights when it is reflected on the individual, society and the state

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	3, 10	LO #1
	Assignments	0			
	Projects / Lab.	0			
	Report	2	10% (10)	13	LO 1,2 and 13
Summative assessment	**Midterm Exam**	2 hr	20% (20)	7	LO # 1-3
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	The Universal Declaration of Human Rights and other countries speak of human rights over the individual, society and the state. Clarifying the meaning of right, duty, responsibility and guarantees of human rights before the judiciary.

Week 2	Sections of human rights in law and Sharia, statement of the rights of God Almighty and guarantees of human rights. It includes sections of the rights of the individual over society such as the right to protect life, honor and mind, and the right to protect money and property.
Week 3	The right to equality before the law and the right to equality and justice among individuals. The right of the individual to work, learn, express his opinion and freedom of thought.
Week 4	Clauses of preserving the freedoms contained in the Universal Declaration of Human Rights, and the impact of the study. Explanation of the meaning of freedom and democracy and the types and divisions of freedoms.
Week 5	Freedoms related to the material rights of an individual, including personal freedom. Freedoms related to the material rights of an individual, including civil liberties.
Week 6	Freedom of movement, residence and ownership. Freedoms related to the moral rights of the individual.
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit.
Week 8	Statement of the sanctity of the home and the right of the individual to move. The rights of society over the individual include the right to freedom of belief and life, the right to honor protection, work and education.
Week 9	Ensuring equality before the law and the judiciary, freedom of opinion and thought, and protection of the mind The right to protection of property and travel.
Week 10	The rights of the individual over the individual, including social rights. Financial rights and its importance in ensuring social life.
Week 11	Finally, emphasizing the importance of commitment to applying human rights and their impact on the individual, society and the state.
Week 12	Freedom of belief, freedom of opinion and expression, and freedom of education. Political freedom, the culture of dialogue and its impact on proving freedom of opinion.
Week 13	One of the heroes of enslaving people and proving freedom for individuals. Highlighting the freedom of women and beautifying them in adhering to the teachings of faith and proving the importance of applying the principle of freedoms among individuals.
Week 14	Individual and international interest in applying the principle of freedoms. Rights and freedoms are two interrelated principles. The role of the individual, society and the state in establishing the principle of human rights and freedoms. And a statement of the negatives in the event of non-application of the principle of freedoms.
Week 15	Iraq and international treaties in the field of human rights and Iraq's position in eliminating dictatorship and racism and work to preserve public rights and public money and eliminate financial and administrative corruption.
Week 16	Preparatory week before the final Exam.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	

Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Lectures on human rights, freedoms and democracy	Yes
Recommended Texts	1. Human rights and freedoms. Prof. Dr. Mustafa Al-Zalmi. 2. Some contemporary published research involving human rights and books on the Universal Declaration of Human Rights	Yes
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Genral Chemistry**			**Module Delivery**	
Module Type	**Support**			☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**ENG002**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level			**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Mohammad Jasem		**e-mail**		
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Dr. Hamad Khalifa		**e-mail**	habdulkadir56@uoanbar.edu.iq	
Scientific Committee Approval Date	01/11/2025		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The goals of this course are to enable students to: 1. Scientific reasoning and quantitative analysis. Our majors will be able to apply chemical concepts to solve qualitative and quantitative problems. 2. Laboratory practice and safety. In order to learn the ways in which new scientific knowledge is created, our majors will experience how chemists interpret chemical and physical phenomena through experimental investigation. They will develop and apply the appropriate lab skills and instrumentation to solve chemical problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of successful completion of this course, the student will be able to: 1. Define the structure of atoms in terms of the nucleus with protons, neutrons, & electrons. 2. Write and balance chemical equations, name inorganic compounds and ions and describe the properties of the main group elements. 3. Carry out chemical calculations, including mass relations in chemical reactions, limiting reagent & reaction yield calculations, and calculations of reactions taking place in solution. 4. Understand the concept of oxidation-reduction, calculate oxidation numbers, and balance redox reactions. 5. Apply the ideal gas law in solving problems involving the gas phase 6. Solve problems in chemical thermodynamics and calorimetry. 7. Predict the electronic structure of atoms and ions from quantum theory, and9) relate the position of an element in the periodic table to its electronic structure and to the physical and chemical properties of the elements. 8. Describe the principles of chemical bonding and write Lewis structures. 9. Predict the geometry of the electron pairs and the shape of molecules using VSEPR theory, predict bond polarity and molecular dipoles. 10. Describe the valence bond theory, predict the hybridization of atoms in molecules, and describe bonding in molecules with single, double and triple bonds in terms of and π bonds, and delocalized molecular orbitals.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A: 1- Handling Numbers. Dimensional Analysis in Solving Problems Recognize chemical safety and hazardous materials icons 2- Atomic Number. Mass Number. and isotopes. The Periodic Table. Molecules and Ions. Describe laboratory instruments and some basic techniques used in the chemistry laboratory, including balances and standard volumetric equipment 3- Chemical Formulas. Naming Compounds. Atomic Mass. Vogadro's number and Molar Mass of an Element. 4- Chemical Reactions and Chemical Equations. 5- Describe how to Prepare accurate laboratory reports of their experimental results; Amounts of Reactants and Products; limiting Reagent Calculations; Reaction Yield; General Properties of Aqueous Solutions. Precipitation Reactions. Acid-Base Reactions; Oxidation-Reduction Reactions; Concentration of Solutions. 6- Acid-Base Titrations, Cases Pressure. 7- The ideal Gas Equation; Gas Stoichiometry; Partial Pressures; The Nature of Energy and types of energy 8- Energy Changes in Chemical Reactions; introduction to Thermodynamics. Enthalpy of Chemical Reactions; Calorimetry; 9- Standard Enthalpy of Formation and Reaction From Classical Physics to Quantum Theory; Bohr's Theory of the Hydrogen Atom; Quantum Numbers; Atomic OrbitalsElectron Configuration; 10- Development of the Periodic Table; Periodic Classification of the Elements; Periodic Variation in Physical Properties; Ionization Energy; Electron Affinity Lewis Dot Symbols; The ionic Bond; The Covalent Bond; Electro negativity; Writing Lewis structure Formal Charge and Lewis Structures. 11- The Concept of Resonance. Exceptions to the Octet Rule Bond Energy 12- Molecular Geometry; Dipole Moment; Spectrophotometric Analysis of tetracycline; Valence Bond Theory. Hybridization of Atomic Orbital's. Hybridization in Molecules Containing Double and Triple Bonds. Delocalized Molecular Orbital's Part B: 1- Types of analysis in analytical chemistry and their uses. Units for expressing concentration. 2- preparing solutions,standard solution,amounts of reactants and products. 3- Chemical equilibrium and reversible reactions,thermodynamics & chemical equilibrium 4- Equilibrium constants for chemical reactions. 5- Describe how to Prepare accurate laboratory reports of their experimental results 6- Equilibrium constants for chemical reactions 7- Electrochemistry, relationship between cell potential and the equilibrium constants relationship between ΔG, K,and E0cell . the Nernst equation. 8- Volumetric analysis their uses and classification, titrimetric analysis calculations. 9-Acid-base titration

	10- Precipitation titration 11- Complexometric titration 12- Oxidation-reduction titration 13- Gravimetric analysis. 14- Introduction and applications of industrial analysis method.

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 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	3 and 10	LO #1, #2 and #3, #4
	Assignments	1	10% (10)	2 and 12	LO #5, #6
	Projects / Lab.	1	10% (10)	Continuous	LO #1, #2 and #3, #4
	Report	0	0 % (0)	-	-

Summative assessment	**Midterm Exam**	2hr	20% (20)	7	LO #1, #2 and #3, #4, #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	MEASUREMENTS IN CHEMISTRY
Week 2	Problem Solving in Chemistry - Dimensional Analysis
Week 3	Atoms, Molecules and Ions
Week 4	Mass Relationships in Chemical Reactions
Week 5	Reactions in Aqueous Solutions
Week 6	Gasses
Week 7	Thermochemistry
Week 8	Quantum Theory and the Electronic Structur of Atoms
Week 9	Chemical Bonding
Week 10	Electrochemistry
Week 11	Volumetric Methods of Analysis
Week 12	Titrations Based on Acid-Base Reactions
Week 13	Titrations Based on Precipitation Reactions
Week 14	Titrations Based on Complexation Reactions
Week 15	**Titrations Based on Redox reactions**
Week 16	**Gravimetric Methods of Analysis**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:

Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Introductory Chemistry Essentials, Nivaldo J. Tro	
Recommended Texts	Chemistry. Steven S. Zumdahl, Susan A. Zumdahl, Donald J. DeCoste	
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Arabic Language1**			**Module Delivery**	
Module Type	**S**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOA001**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		UG1	**Semester of Delivery**		2
Administering Department		Electrical Engineering	**College**	Engineering	
Module Leader	Muanna W Naji		**e-mail**	muanna.naji@uoanbar.edu.iq	
Module Leader's Acad. Title		Assistant Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		02/10/2025	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This course aims to build students' knowledge and competence in the Arabic language, rhetoric, and Arabic literature of all kinds, to increase their ability to appreciate literature and develop their awareness of its concepts through the study of poetry, novels, and short stories. story. C- thinking skills: 1. Work on developing the intellectual property of the student. 2. Ensuring the personal development of the student at the academic level.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Develop academic essay writing proficiency 2. Apply reading skills 3. Expand academic vocabulary through reading 4. Improve critical thinking skills 5. Developing the student's intellectual property in the field of the Arabic language, to acquire verbal and actual ability and skill.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Indicative Contents المحتويات الإرشادية	

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	5	25% (25)	3,7, 10	LO #4, 6, 8 and 10
	Assignments	2	5% (6)	7	LO # 2
	Projects / Lab.	0			
	Report	1	10% (10)	13	LO # 5, 7 and 13
Summative assessment	**Midterm Exam**	2 hr	10% (10)	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	❖ From Surah Al-Baqarah, verses (260-263) From Surah Al-Hajj, verses (1-5).
Week 2	❖ From the noble Prophetic hadith: The Messenger of Allah, peace and blessings be upon him and his family, said: "I was sent only to perfect noble character". From the noble Prophetic hadith: The Messenger of Allah, peace and blessings be upon him and his family, said: "The best of you are those who learn the Qur'an and teach it."
Week 3	❖ Poetic selections in the pre-Islamic era: The Mu‘allaqāt as a choice. Seven verses from Ibn al-Rūmī’s Bā’iyya:
Week 4	❖ Human values in pre-Islamic poetry . Islam and poetry.
Week 5	❖ The morphological balance. Plurals in Arabic.
Week 6	❖ Assigning the verb to pronouns .

	Conjugation of verbs in terms of: soundness and weakness, simplicity and augmentation, and derivatives.
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Rules for writing the hamza (initial, medial, and final positions, and the hamzat al-wasl and al-qat‘).
Week 9	❖ Rules for writing punctuation marks . The alphabet letters (sun letters and moon letters).
Week 10	❖ Parts of Speech and Their Inflectional Markers (or Signs of Grammatical Ending.) Inflected (Mu'rab) and Uninflected (Mabni) / Definite (Ma'rifa) and Indefinite (Nakira).
Week 11	❖ The requested Arabic phrase translates to: ❖ Incomplete Verbs (Nawāsikh). The Subject (Fā'il) and Its Deputy (Nā'ib 'anhu) / The Vice Subject.
Week 12	❖ A general introduction to rhetoric: its linguistic and terminological definition, the sciences of rhetoric, and its relationship to language. ❖ Rhetoric: Simile: its definition, types, and applications.
Week 13	❖ Truth and Metaphor. ❖ Linguistic Metaphor: Definition, Relationships, and Applications. Metaphor: Definition, Types, and Applications.
Week 14	❖ Metaphor: Definition, Relationships, and Applications. ❖ Metaphor: Definition, Types, and Applications. Common Grammar Mistakes.
Week 15	Common language errors
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Lectures in the Arabic language.	Yes
Recommended Texts	Meanings of grammar / Prof. Dr. Fadel Al-Samarrai	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Calculus II			**Module Delivery**	
Module Type	B			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENG004				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		1	**Semester of Delivery**		2
Administering Department		Electrical	**College**	College of Engineering	
Module Leader	Yasameen Kamil Najm		**e-mail**	yknajm@uoanbar.edu.iq	
Module Leader's Acad. Title		lecturer	**Module Leader's Qualification**		MSc.
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		24/09/2025	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG003	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This course aims to provide the student with the skill of dealing with mathematical equations, clarifying the concept of differentiation and integration, and the polar, Cartesian, and cylindrical coordinates. 2. Demonstrate methods for solving integrals and sequences and series. 3. The course aims to study the applications of integration in calculating the lengths of curves, areas, and volumes in different coordinates and some physical applications. 4. The course aims to give the student a new background that he can benefit from when studying differential equations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Evaluate definite, indefinite, and improper integrals by using different integration techniques. 2. To determine arc length, surface area and volume by using the applications of integration techniques. 3. Define polar coordinate graphs and solve related problems including area, arc length and volume. 4. Identify the properties of sequences and their limits with identifying standard convergent operations of power series.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Principles of Integration 2. Integral Methods 3. Integration Techniques-Integration by Parts 4. Integration Techniques-Trigonometric Integrals 5. Integration Techniques-Partial Fractions. 6. Applications of Integrals-Infinite Integral Areas 7. Applications of Integrals-Arc Length, Surface area 8. Applications of Integrals-Volumes (Disk, Washer, Shell) 9. Polar Coordinates - Common Polar Coordinate Graphs 10. Polar Coordinates - Tangents with Polar Coordinates, Curves defined by parametric equations. 11. Sequences and Series

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 type of simple experiments involving some

	sampling activities that are interesting to the students.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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**	5	25% (25)	2,4,6, 10, 12	LO# 1, LO# 2and LO# 4
	Assignments	2	10% (10)	5, 13	LO# 2and LO# 4
	Projects / Lab.				
	Report		5%(5)		
Summative assessment	**Midterm Exam**	1hr	10% (10)	7	LO# 1 and LO# 2
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Principles of Integration
Week 2	Integral Methods
Week 3	Integration Techniques-Integration by Parts
Week 4	Integration Techniques-Trigonometric Integrals

Week 5	Integration Techniques-Partial Fractions.
Week 6	Integration Techniques-Partial Fractions
Week 7	Applications of Integrals-Infinite Integral Areas
Week 8	Applications of Integrals-Arc Length, Surface area
Week 9	Applications of Integrals-Volumes (Disk, Washer, Shell)
Week 10	Polar Coordinates - Common Polar Coordinate Graphs
Week 11	Polar Coordinates - Tangents with Polar Coordinates, Curves defined by parametric equations.
Week 12	Polar Coordinates - Tangents with Polar Coordinates, Curves defined by parametric equations.
Week 13	Sequences and Series
Week 14	Sequences and Series
Week 15	Sequences and Series
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Stewart, J., Clegg, D. K., & Watson, S. (2020). Calculus: early transcendental. Cengage Learning	
Recommended Texts	Thomas, G. B., Haas, J., Heil, C., & Weir, M. (2018). Thomas' Calculus. Pearson Education Limited.	

	Stroud, K. A., & Booth, D. J. (2020). Engineering mathematics. Bloomsbury Publishing.	
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Science I**			**Module Delivery**	
Module Type	**Related**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOA007**				
ECTS Credits	**3**				
SWL (hr/sem)	**100**				
Module Level		UG2	**Semester of Delivery**		2
Administering Department		Electrical	College	College of Engineering	
Module Leader	Ahmed Jamal Ahmed		**e-mail**	Ahmed.j.ahmed@uoanbar.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		10/01/2026	**Version Number**		2.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1-Utilize the computer for fundamental tasks. 2-Identify and discuss the hardware components of the computer system. 3-creating documents using word processor and creating presentation. 4-Conducting research on the internet. 5-An introduction to Artificial Intelligence.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introduction to computers, computer components, concepts of hardware and software. 2. Operating System and Graphical user interface. 3. Introduction to Word, spread sheet, text creation and manipulation. 4. Create Presentation, Presentation slides. 5. Introduction to Internet and Web Browsers, computer networks, internet and its applications, world wide web. 6. Communication and Emails, getting email accounts, sent mail. 7. Identifying and solving common hardware and software.
Indicative Contents المحتويات الإرشادية	- Introduction of Computers - Operating system - Internet and web browsers

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 type of simple experiments involving some sampling activities that are interesting to the students.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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**	5	25% (25)	3,5,9, 11,13	LO #1, 2, 10 and 11
	Assignments	2	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.		6% (4)	Continuous	
	Activities		4% (6)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	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	Introduction to computers: concepts of hardware and software with their components, concept of computing data and information. application of information electronics and communication technology
Week 2	Computer components: computer portions, hardware parts, I/O units, Memory types.
Week 3	Basic CPU Component, Computers ports, personal computer
Week 4	Operating System and Graphical User Interface GUI, operating system; Basics of common operating system, the user interface
Week 5	Use of common icons, using mouse techniques, Status Bar, using menu and menu-selection, concept of folder and directions, opening and closing different windows, create short cuts.
Week 6	Word processing: word processing basics, opening and closing of documents, text creation and manipulation.
Week 7	**Mid – term Exam**

Week 8	Formatting of text, table handling, spell check, language setting and thesaurus, printing of word document.
Week 9	Spread sheets: Basics of spreadsheet, manipulation of cells
Week 10	Formulas and functions, editing of spread sheet, printing of spread sheet.
Week 11	Presentation of Software: Basics of presentation software; Creating presentation.
Week 12	Preparation and presentation of slides; slide show; taking printouts of presentation/ handouts.
Week 13	Introduction of internet and web browsers: Computer network basic; LAN, WAN; concept of internet and its applications; connecting to internet world wide web; browsing software's, search engines; understanding URL; domain name; IP address.
Week 14	Communications and Emails: Basics of electronic mail; getting an email account, sending and receiving emails; accessing sent emails; using emails; document collaboration.
Week 15	Computer troubleshooting: Identifying and solving common hardware and software problems that computer users encounter, basic troubleshooting techniques and tools for diagnosing and resolving issues.
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to Computer .
Week 2	Lab 2: Computer Hardware and Software, operating system.
Week 3	Lab 3: Word processing.
Week 4	Lab 4: presentation software.
Week 5	Lab 5: Internet and web browsers.
Week 6	Lab 6: Emails, sending emails and receiving email.
Week 7	Lab 7: Identifying and solving common hardware and software problems.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1-Graham Brown, David Watson, "Cambridge IGCSE Information and communication technology", 3rd edition (2020) 2-Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology in action complete", 16th edition(2020). 3-Ahmed Banafa, "Introduction to Artificial Intelligence	Yes

	(AI)", 1st Edition (2024). الخضر على الخضر بحاث "اساسيات الحاسوب"2016-4 الدكتور عادل عبدالنور, مدخل الى عالم الذكاء الاصطناعي"2005-5	
Recommended Texts		
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Digital Techniques**			**Module Delivery**	
Module Type	**Core**			☐ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ELE002				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		1	**Semester of Delivery**		2
Administering Department		Electrical	**College**	College of Engineering	
Module Leader	Zainab najeeb		**e-mail**		
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**		
Peer Reviewer Name		Name	**e-mail**		
Scientific Committee Approval Date		10/10/2025	**Version Number**		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the student to digital fundamentals concepts, which includes: numbers systems. Codes, Types of logic gates, and Boolean expressions of different circuits. The course also examines the design of main logic circuits, along with an introduction to analysis of clocked sequential circuits, Flip-flops, types of flip-flops, there logic symbols, and excitation tables of different flip-flops .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand concept of data representation and conversion between number systems. 2. Understand Binary arithmetic and other code numbers arithmetic. 3. Recognize the different types of codes. 4. Operate on Boolean algebra, and simplification of Boolean function. 5. Understand different types of logic gates, and here truth tables. 6. Apply methods of simplification and minimization of Boolean expressions. 7. Be familiar with multi-level gate circuits and combinational circuits. 8. construct truth tables of various logic expressions. 9. analyze and design procedures of Sequential circuits. 10. Implement functions using digital circuit (Sequential). 11. design sequential systems through the application of system reduction techniques and the use of sequential system design tools.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Introduce the data,Number Systems, Conversion between Number Systems. 2. 2-Complement Arithmetic, Binary Arithmetic, BCD arithmetic. 3. Codes and their conversions. 4. Definition of Boolean Algebra. Properties and Theorems of Boolean Algebra,Boolean Functions, Simplification of Boolean Expressions. 5. Digital Logic Gates. Truth tables of logic gates. 6. simplification and minimization of Boolean function using Karnaugh map, 7. Multi-level gate circuits. Design of multi levels NAND and NOR gates. 8. Combinational circuits design; Adder, Substrate, code conversion, magnitude comparator 9. Decoder, Encoder, Multiplexer, Demultiplexer, parity generator. 10. Latches and Flip-flops Types of Flip-flops, Clocked S-R Flip-flop, J-K Flip-flop, 11. Triggering of Flip-flops, Excitation Table of a Flip-flop, Sequential Circuit Model,

	Classification and Analysis of Sequential Circuits 12. Registers and Shift Registers, 13. Counters, Synchronous Counters (Ripple,Up-down mode N) counters 14. Design Procedure of counters Circuits.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	38	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
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**	2	10% (10)	5, 10	LO# 2, LO# 5and LO# 9
	Assignments	2	5 % (10)	2, 12	LO# 6 and LO# 11
	Projects / Lab.	1	10% (10)	Continuous	LO# 4, LO5 5and LO# 6
	Report	1	10% (10)		LO# 8
Summative assessment	**Midterm Exam**	2 hr	15% (10)	8	LO#1 to LO# 8
	Final Exam	2hr	60% (50)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to data ,Number system and background to the combinational logic cct .
Week 2	Introduction to Complement Arithmetic, Signed Binary Numbers, Binary Arithmetic, BCD arithmetic.
Week 3	Introduction to Codes ,types and their conversions.
Week 4	Definition of Boolean Algebra. Properties and Theorems of Boolean Algebra
Week 5	Analysis of Boolean Functions, Simplification of Boolean Expressions
Week 6	Introduction to Digital Logic Gates. Types and Truth tables of logic gates
Week 7	Analysis of simplification and minimization of Boolean function using Karnaugh map.
Week 8	Midterm Exam
Week 9	Multi-level gate circuits. Design of multi levels NAND and NOR gates.
Week 10	Combinational circuits design; Adder, Substrate, code conversion, magnitude comparator
Week 11	Decoder, Encoder, Multiplexer, Demultiplexer, parity generator.
Week 12	Latches and Flip-flops Types of Flip-flops, Clocked S-R Flip-flop, J-K Flip-flop,
Week 13	Triggering of Flip-flops, Excitation Table of a Flip-flop, Sequential Circuit Model, Classification and Analysis of Sequential Circuits
Week 14	Registers and Shift Registers,
Week 15	Counters, Synchronous Counters (Ripple,Up-down mode N) counters, Design Procedure of counters Circuits
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Logic gates circuits.
Week 2	Lab 2: Combinational logic circuits.
Week 3	Lab 3: Comparator circuits.
Week 4	Lab 4: Half-adder and full adder circuit.
Week 5	Lab 5: Half sub tractor and full sub tractor.
Week 6	Lab 6: Decoder circuit and Encoder circuit..
Week 7	Lab 7: Multiplexer circuit.

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	A. Saha, and N. Manna, “Digital Principles and Logic Design”, Infinity Science Press LLC, (2007).	Yes
Recommended Texts	Thomas Floyd, “Digital fundamentals”, 8th edition, Person education Inc.	Yes
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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Fundamentals of Electrical Engineering I			Module Delivery	
Module Type	C			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE01				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UG1	Semester of Delivery		2
Administering Department		Electrical	College	College of Engineering	
Module Leader	thaker Mahmood Nayl		e-mail	thaker.nayl@uoanbar.edu.iq	
Module Leader's Acad. Title		Assist. Prof	Module Leader's Qualification		PhD
Module Tutor	Sameh Jassam Mohammed		e-mail	samehjassam@uoanbar.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		30/June/2023	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG005	Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power with Ac from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current
Indicative Contents المحتويات الإرشادية	AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. RL, RC and RLC circuits Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, maximum power transfer, RMS and power dissipation.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	92	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	108	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO# 2, LO# 5and LO# 9
	Assignments	2	5% (5)	2, 12	LO# 6 and LO# 11
	Projects / Lab.	1	10% (10)		LO# 4, LO5 5and LO# 6
	Report	1			LO# 7
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO#1 to LO# 7
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Capacitors
Week 2	Series and Parallel Capacitors
Week 3	Inductors
Week 4	Series and Parallel Inductors
Week 5	Sinusoidal Current
Week 6	Phasors
Week 7	Impedance and Admittance
Week 8	Kirchhoff's Laws in the frequency domain
Week 9	Midterm Exam 1
Week 10	Nodal analysis in the frequency domain
Week 11	mesh analysis in the frequency domain
Week 12	Superposition in the frequency domain
Week 13	Source Transformations in the frequency domain
Week 14	Thévenin and Norton Equivalents in the frequency domain
Week 15	Maximum , Average Power Transfer, RMS value
Week 16	Midterm Exam 2

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	Lab 1: Kirchhoff's Laws
Week 2	Lab 2: Nodal Analysis

Week 3	Lab 3: Mesh Analysis
Week 4	Lab 4: Superposition Theorem
Week 5	Lab 5: Source Transformations
Week 6	Lab 6: Thévenin and Norton Equivalents
Week 7	Lab 7: Maximum Power Transfer

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	English Language I			**Module Delivery**	
Module Type	S			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOA003				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		UG1	**Semester of Delivery**		Two
Administering Department		EE	**College**	ENG	
Module Leader	Abdullah Khalid Ahmed		**e-mail**	Abdullahkhalid.ahmed@uoanbar.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc.
Module Tutor			**e-mail**		
Peer Reviewer Name		Dr. Ehsan Hamyan Sabbar	**e-mail**	Ehsan.sabbar@uoanbar.edu.iq	
Scientific Committee Approval Date		01/11/2025	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	-
Co-requisites module	None	**Semester**	-

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

Module Aims
أهداف المادة الدراسية

1. Expand vocabulary and enhance communication in everyday situations.
2. Improve grammar skills for more accurate speaking and writing.
3. Develop better listening comprehension abilities.
4. Enhance spoken English fluency, accuracy, and pronunciation.
5. Improve reading comprehension and extract key information from texts.
6. Strengthen writing skills for well-structured and grammatically accurate compositions.
7. Increase cultural awareness of English-speaking societies and customs.

Module Learning Outcomes
مخرجات التعلم للمادة الدراسية

By the end of successful completion of this course, the student will be able to:

1. Develop academic writing
2. Apply reading skills
3. Expand academic vocabulary through reading
4. Speak through group discussions and debates

Indicative Contents
المحتويات الإرشادية

Indicative content includes the following.

☐ Auxiliary verbs	☐ Making an offer
☐ Greetings forms	☐ prepositions
☐ Learning English words by asking	☐ Rooms and furniture
☐ Making Plurals	☐ Directions
☐ Knowing the numbers	☐ Have/ do/ go
☐ Knowing countries in English	☐ Saying years
☐ Learning how to ask about others countries/ Nationality	☐ Past simple- irregular verbs
☐ Subjects and possessive pronouns	☐ When's your birthday?
☐ Using adjectives	☐ Can/ can't
☐ Making negatives and questions	☐ Adjective+ noun
☐ Making interview and knowing personal information	☐ Going sightseeing
☐ Possessives (Verbs)	☐ I'd like- some/ any
☐ Learning how to ask about others favorites and hobbies	☐ Signs all around
☐ Using articles	☐ Present Continuous
☐ Prices and currencies	☐ In a restaurant
☐ Present simple tense	☐ Clothes- Opposite verbs
☐ The time	☐ What’s matter
☐ Using some adverbs	☐ Transport

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, speaking interactive activities and by considering type of activities that are interesting to the students.

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**	**5**	**25% (25)**	**5, 10**	**LO #1, and 2**
	Assignments (HW)	**2**	**5% (5)**	**2, 4, 6, 8, 9, and 10**	**LO # 1-3**
	Report	**1**	**5% (5)**		
	Activities		**5% (5)**	**Through lectures**	**LO# 4**
	Lab				
Summative Assessment	**Midterm Exam**	**2 hr**	**10% (10)**	**7**	**LO # 1-3**
	Final Exam	**3 hr**	**50% (50)**	**16**	**All**
Total Assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
1.	• Am/ are/ is, my/ your • How are you? • What's this in English? • Plurals • This is ……. • Good morning! • Numbers 1-10
2.	• Countries • Where's he from? • Numbers 11-30 • He/ she/ they, his/ her • Fantastic/ awful/ beautiful
3.	• Jobs • Negatives and questions • Social expressions-1 • Am/are/is • Personal information
4.	• Our/ their • The family • The alphabet • Possessive's • Has/ have
5.	• Sports/ food/ drinks • a/ an • Numbers and prices • Present simple- I/ you/ we/ they • languages and nationalities
6.	• The time • Always/ sometimes/ never • Days of the week • Present simple- he/ she • Words that go together
7.	**Mid-term Exam**
8.	• Question words • This/ that • Can I ….? • Me/ him/ us/ them • adjectives
9.	• Rooms and furniture • Prepositions • There is/ are • Directions

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
10.	• Saying years • Past simple- irregular verbs • When's your birthday? • As/ were born • Have/ do/ go
11.	• Past simple- regular and irregular • Sport and leisure • Questions and negatives • Going sightseeing
12.	• Can/ can't • Adjective+ noun • Adverbs • Everyday problems
13.	• I'd like- some/ any • Signs all around • In a restaurant
14.	• Present Continuous • Present Simple & Present Continuous • Clothes- Opposite verbs • What's matter
15.	• Future Plans • Revision • Transport • Social Expressions-2
16.	**Preparatory for final exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	-John & Liz Soars, "New Headway Plus- Beginner Student's Book", 10th ed 2014	Yes
Recommended Texts	-Raymond Murphy; "English Grammar in Use", 4th edition 2012 Understanding and Using English Grammar, Vol. A, 4th Edition 4th Edition	No
Websites	https://elt.oup.com/catalogue/items/global/adult_courses/new_headway/beginner_fourth_edition/?cc=global&selLanguage=en https://www.amideast.org/jordan/learn-english/learn-english-online?gclid=EAIaIQobChMIoeyGmdm_ggMVFweLCh2FowJ1EAAYASAAEgKjFfD_BwE	

	https://learnenglish.britishcouncil.org/

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.

Module Approval المصادقةعلى وصف المادة الدراسية			
	Name	**Date**	**Signature**
Module LeaderApproval		**8/6/2023**	
Peer Reviewer Name		**8/6/2023**	
Scientific Committee Members Approval		**8/6/2023**	
		8/6/2023	
		8/6/2023	
		8/6/2023	
		8/6/2023	

Scientific CommitteeHeadApproval		**8/6/2023**	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Mechanics I (Static)**			**Module Delivery**	
Module Type	**Supportive**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ENG006**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	UGI		**Semester of Delivery**	2	
Administering Department	ME		**College**	ENG	
Module Leader	Dr. Ammar ahmed		**e-mail**		
Module Leader's Acad. Title	Assit. Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	20/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Force system 2. Equilibrium of particles 3. Force System Resultants 4. Equilibrium of a Rigid Body 5. Trusses: method of joint and sections 6. Frames 7. Centroid 8. Moment of inertia 9. frictions
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To determine the resultant of Coplanar forces in two and three dimensions 2. To introduce the concept of the free-body diagram for a particle. 3. To show how to solve particle equilibrium problems using the equations of equilibrium. 4. To provide a method for finding the moment of a force about a specified axis. 5. To define the moment of a couple. 6. To present methods for determining the resultants of non-concurrent force systems. 7. To indicate how to reduce a simple distributed loading to a resultant force having a specified location. 8. To develop the equations of equilibrium for a rigid body. 9. To introduce the concept of the free-body diagram for a rigid body. 10. To show how to determine the forces in the members of a truss using the method of joints and the method of sections. 11. To analyze the forces acting on the members of frames and machines composed of pin-connected members. 12. To show how to determine the location of the center of gravity and centroid for a system of discrete particles and a body of arbitrary shape. 13. To develop a method for determining the moment of inertia for an area. 14. To introduce the product of inertia and show how to determine the maximum and minimum moments of inertia of an area 15. To introduce the concept of dry friction and show how to analyze the equilibrium of rigid bodies subjected to this force.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Force system: Resultant of forces on particles in two and three dimensions. 2. Equilibrium of particles: Free-Body-diagram, equation of equilibrium. 3. Force System Resultants: resultant of force and moment on rigid body, couples, moment about point in two and three dimensions, moment about axis. 4. Equilibrium of a Rigid Body: Free-Body Diagrams, Equations of Equilibrium. 5. Trusses: method of joint and sections 6. Frames: Free-Body Diagrams, Equations of Equilibrium. 7. Centroid: Centroids of Lines, Areas, and Volumes. Moment of inertia: Parallel-Axis Theorem for an Area, Radius of Gyration of an Area, Moments of Inertia for Composite Areas.

	1. Friction: Mechanism of Dry Friction, Static Friction.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to: 1. Encourage students' participation in the exercises 2. 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			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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	20% (20)	3,5,7,9,11,13	LO # All
	Assignments	2	10% (10)	2, 12	LO # 4, 5, 6, 10.
	Projects / Lab.				
	Report	-	10% (10)	-	-
Summative assessment	**Midterm Exam**	2 hr	10% (10)	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	Force system
Week 2	Force system
Week 3	Equilibrium of particles
Week 4	Equilibrium of particles
Week 5	Force System Resultants
Week 6	Force System Resultants
Week 7	Equilibrium of a Rigid Body
Week 8	Equilibrium of a Rigid Body
Week 9	Trusses: method of joint and sections
Week 10	Trusses: method of joint and sections
Week 11	Frames
Week 12	Frames
Week 13	Centroid
Week 14	Moment of inertia
Week 15	frictions
Week 16	**Final Exams**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	

Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	R. C. Hibbeler, "Engineering Mechanics - Statics " 13th Edition, 2012	Yes
Recommended Texts	J.L Meriam and L.G. Kraige (2016) Engineering mechanics statics	Yes
Websites		

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.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Calculus III	**Module Delivery**	
Module Type	B (Basic learning activities)	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENG008		
ECTS Credits	5		
SWL (hr/sem)	125 (Student Workload)		

Module Level	2	**Semester of Delivery**	3
Administering Department	Electrical Engineering	**College**	College of Engineering
Module Leader	Abdullah Fawzi Shafeeq	**e-mail**	abdullah.fawzi@uoanbar.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ms.c
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	01/06/2025	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG04	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of engineering Mathematics. Specifically, the basic concepts of vectors, lines, and planes. Partial differential equations. Multiple and surface integrations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the Vectors and The Geometry of Space. 2. Understand the Lines and Planes in Space. 3. Understand the Vector Functions and Motion in Space. 4. Understand the partial derivatives 5. Explain multiple and surface integrations.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Vectors and the Geometry of Space: Three-Dimensional Coordinate Systems, Vectors, The Dot Product, The Cross Product, Lines and Planes in Space, Cylinders and Quadric Surfaces 2. Vector-Valued Functions and Motion in Space: Curves in Space and Their Tangents, Integrals of Vector Functions; Projectile Motion, Arc Length in Space, Curvature and Normal Vectors of a Curve, Tangential and Normal Components of Acceleration 3. Partial Derivatives: Functions of Several Variables, Limits and Continuity in Higher Dimensions, Partial Derivatives, The Chain Rule, Directional Derivatives and Gradient Vectors, Tangent Planes and Differentials, Extreme Values and Saddle Points. 4. Multiple Integrals: Double and Iterated Integrals over Rectangles, Double Integrals over General Regions, Area by Double Integration, Double Integrals over polar coordinates Triple Integrals in Rectangular Coordinates, Triple Integrals in cylindrical and spherical coordinates.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage student's 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 some activities that are interesting to the students.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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**	5	25% (25)	3,6,9,11, and 13	
	Assignments	2	6% (6)	4 and 12	
	Activities	1	5% (5)	7	
	Report	1	4% (4)	12	
Summative assessment	**Midterm Exam**	2hr	10% (10)	9	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Three-Dimensional Coordinate Systems
Week 2	Vectors
Week 3	Product of Vectors
Week 4	Lines and Planes in Space
Week 5	Vector-Valued Functions and Motion in Space
Week 6	Curvature and Normal Vectors of a Curve
Week 7	Partial Derivatives
Week 8	Partial Derivatives
Week 9	Midterm Exam
Week 10	Directional Derivatives and Gradient Vectors
Week 11	Tangent Planes, Normal Lines, Extreme Values and Saddle Points
Week 12	Double Integrals
Week 13	Double Integrals
Week 14	Triple Integrals
Week 15	Triple Integrals
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas' Calculus Early Transcendentals 12th Edition.by George B. Thomas Jr. (Author), Maurice D. Weir (Author), Joel R. Hass (Author).	Yes
Recommended Texts	Advanced Engineering Mathematics 10th Edition by Erwin Kreyszig (Author), Herbert Kreyszig (Author), Edward J. Norminton (Author)	Yes
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	DC Machines I			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE015				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UG2	Semester of Delivery		3
Administering Department		Electrical	College	College of Engineering	
Module Leader	Settar Subry Keream		e-mail	Settar.keream@uoanbar.edu.iq	
Module Leader's Acad. Title		Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		30/sep/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE001	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of DC machines. Specifically, the generator operation, Dc motors
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-This course is designed to enable the students to understand the DC machines as a required at department level. 2-The course integrates the Generator-principle of rotating electrical machines and calculation of induced e.m.f., energy, power and torque in DC machines .3- Construction of DC machines and function of commutator. Type of armature windings. 4-Calculation of m.m.f. per pole. Type of excitation connections. Armature reaction. Commutation.
Indicative Contents المحتويات الإرشادية	DC MACHINE BASICS: Basic Interactions, Wire loop, Commutator, Armature, Magnetic Field, Armature Coil Equations, Coil emf, Coil Torque, Coil Resistance, Electromechanical Power Conversion, Generator Action, Motor action, CONSTRUCTION: Materials, Temperature Rise, Machine Rating, Main parts of the DC machine. ARMATURE WINDING: Winding details, Winding Schemes, Lap winding, Wave winding, Armature Calculations. MAIN FIELD: Main Field Distribution, Field excitation, Magnetization curve ARMTURE REACTION: Distributed Armature m.m.f., Resultant field, Effects of armature reaction, Demagnetizing effect, Treatment of Armature Reaction, Brush shift, Commutation: The Process of Commutation, Equivalent circuit of commutating coil, Linear Commutation, Treatment of sparking, Interpoles, Losses of DC machine

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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	3	10% (10)	5, 10	LO# 1, LO# 2and LO# 4
	Assignments	2	5% (5)	2, 12	LO# 2and LO# 4
	Projects / Lab.	1	10% (10)		LO# 3and LO# 4
	Report	1			LO# 3
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO# 1 and LO# 2
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	DC MACHINE BASICS: Basic Interactions, Wire loop,
Week 2	Commutator, Armature, Magnetic Field, Armature Coil Equations, Coil emf, Coil Torque, Coil Resistance,
Week 3	Electromechanical Power Conversion, Generator Action, Motor action,
Week 4	CONSTRUCTION: Materials, Temperature Rise, Machine Rating, Main parts of the DC machine.
Week 5	ARMATURE WINDING: Winding details, Winding Schemes, Lap winding, Wave winding, Armature Calculations
Week 6	MAIN FIELD: Main Field Distribution, Field excitation, Magnetization curve
Week 7	ARMTURE REACTION: Distributed Armature m.m.f., Resultant field, Effects of armature reaction, Shift of the magnetic neutral axis, Treatment of Armature Reaction
Week 8	Midterm Exam
Week 9	Commutation: The Process of Commutation, Equivalent circuit of commutating coil, Linear Commutation, Treatment of sparking, Interpoles, Brush shift
Week 10	GENERATOR OPERATION: The Voltage Equation, Speed of Rotation, Field excitation
Week 11	Voltage drops, Definitions,
Week 12	Voltage control, Voltage regulation
Week 13	Voltage Build-Up,.
Week 14	Applications, Parallel operation
Week 15	losses
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	LAB1: The construction of DC Machines
Week 2	LAB2: Building- up voltage of self – excited shunt generator
Week 3	LAB3: Characteristic of separately excited generator
Week 4	LAB4: Characteristic of self – excited shunt generator
Week 5	LAB5: Characteristic of a. compound generator and b. series generator
Week 6	LAB6: separation of mechanical ,eddy – current and hysteresis losses in DC generator by an auxiliary motor
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Theraja and Theraja (A Textbook of Electrical Technology) volume I basic electrical engineering in S.I. System of units revised by: Tarnekar Chand an ISO 9001:2000 company Chand & company ltd. Ram Nagar (2005)	yes
Recommended Texts		
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Digital Techniques II**			**Module Delivery**	
Module Type	**Core**			☐ **Theory** ☒ **Lecture** **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ELE040				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level		UG2	**Semester of Delivery**		3
Administering Department		Electrical	**College**	College of Engineering	
Module Leader	Mohammad A.Faraj		**e-mail**	Mohammed.Faraj@uoanbar.edu.iq	
Module Leader's Acad. Title		Dr.	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**		
Peer Reviewer Name		Name	**e-mail**		
Scientific Committee Approval Date		10/9/2025	**Version Number**		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE002	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the student to understand the Flip-flops, types of flip-flops, there logic symbols, and excitation tables of different flip-flops. The course also examines the design of main logic circuits, along with an introduction to analysis of clocked sequential circuits and the topics of sequential circuit analysis and design, PLD, and Logic families.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. analyze and design procedures of Sequential circuits. 2. Implement functions using digital circuit (Sequential). 3. design sequential systems through the application of system reduction techniques and the use of sequential system design tools 4. Differentiate between Logic families. 5. Define the problem (Inputs and Outputs) of the PLDs, and write its functions 6. Use simulation software, for testing the designed circuit. 7. Describe the difference between combinational and sequential logic circuits, and the applications of various memory units. 8. Implement functions using digital circuit (Sequential).
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Latches and Types of Flip-flops, Clocked S-R Flip-flop, J-K Flip-flop, 2. Clocked D Flip-flop, T Flip-flop, Toggling Mode of S-R and D Flip-flops, 3. Triggering of Flip-flops, Excitation Table of a Flip-flop, Sequential Circuit Model, Classification of Sequential Circuits 4. Analysis of Sequential Circuits, 5. Registers and Shift Registers, 6. Counters, 7. Synchronous Counters. 8. Ripple (Asynchronous) Counters. 9. Up-down counter, mode N counters ,Code converters counters 10. Sequential circuits: design, implementation and minimization 11. Sequential Circuits with Programmable Logic Devices: introduction, and types of PLDs 12. Random-Access Memory. Memory Decoding. Read-Only Memory. 13 . Integrated circuit technologies, basic concepts, major IC technologies: TTL and CMOS.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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**	5	25% (10)	1,3,5, 8,10	LO# 2, LO# 5and LO# 9
	Assignments	2	5 % (10)	2, 12	LO# 6 and LO# 11
	Projects / Lab.	1	5% (10)	Continuous	LO# 4, LO5 5and LO# 6
	Report	1	5% (10)		LO# 8
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO#1 to LO# 8
	Final Exam	2hr	50% (50)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Latches and Types of Flip-flops,
Week 2	Clocked S-R Flip-flop, J-K Flip-flop, Clocked D Flip-flop, T Flip-flop, Toggling Mode of S-R and D Flip-flops
Week 3	Introduction to Triggering of Flip-flops, Excitation Table of a Flip-flop,

Week 4	Definition Registers and Shift Registers,
Week 5	Introduction to Counters,
Week 6	Analysis of Synchronous Counters.
Week 7	Analysis of Ripple (Asynchronous) Counters.
Week 8	Midterm Exam
Week 9	Up-down counter,
Week 10	mode N counters ,
Week 11	Code converters counters
Week 12	Fundamentals of Random-Access Memory Read-Only Memory and . Memory Decoding.
Week 13	Introduction to Programmable Logic Devices (PLDs)
Week 14	Integrated circuit technologies, basic concepts, major IC technologies:
Week 15	Introduction to TTL and CMOS
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	A. Saha, and N. Manna, “Digital Principles and Logic Design”, Infinity Science Press LLC, (2007).	Yes
Recommended Texts	Thomas Floyd, “Digital fundamentals”, 8th edition, Person education Inc.	Yes

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electric Circuits I			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE003				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UG2	Semester of Delivery		3
Administering Department		Electrical	College	College of Engineering	
Module Leader	Mushtaq Najeeb Ahmed		e-mail	mushtaq.najeeb@uoanbar.edu.iq	
Module Leader's Acad. Title		Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		1/Oct/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE001	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is a first course on electric circuits. The course is designed to provide students with an importance for electrical engineering field: Natural and Step Response of RL and RC Circuits, Sequential Switching; Natural and Step Response of Parallel and Series RLC Circuits. Operation Amplifiers. Balanced Three-Phase Circuits, Analysis of circuits (Wye, Delta); Power Calculations. Unbalanced Three-Phase systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Response of RL and RC circuits: Natural and step responses of RL and RC circuits. Natural and step responses of RLC circuits 2. Operational amplifier terminals, terminal voltages and currents, the inverting and non-inverting amplifier circuit, the summing-amplifier circuit, and the difference –amplifier circuit 3. Balanced Three-Phase Circuits: 3-P Voltages, 3-P Voltage Sources, Analysis of Y-Δ transformation; Power Calculations and Measurements of Average Power in 3-PCircuits. 5.Unbalanced Three-Phase systems
Indicative Contents المحتويات الإرشادية	● Analyze and determine the complete response of RL, RC and RLC circuits ● Analyze inverting, summing, and noninverting Op amp circuits. ● understand 3-phase system and its power calculation. ● apply delta–wye or wye–delta transformation in Three-Phase Circuits as necessary to simplify circuit analysis.

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 type of simple experiments involving some sampling activities that are interesting to the students.

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	4.133
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.867
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	5	25%		LO# 1, LO# 2and LO# 3
	Assignments	1	5 %		LO# 1and LO# 2
	Activities	1	5 %		
	Report	1	5 %		
Summative assessment	Midterm Exam	1hr	10 %		LO# 1 and LO# 2
	Final Exam	3hr	50 %		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Operational Amplifier (Ideal, Inverting, and Non-inverting)
Week 2	Operational Amplifier (Summing, Subtracting, Cascaded, Integrator, and Differentiator)
Week 3	Source-Free RC Circuit
Week 4	Source Free RL Circuit
Week 5	Step Response of RC Circuit
Week 6	Step Response of RL Circuit
Week 7	Introduction to Second Order Circuits
Week 8	Source Free Series RLC Circuit
Week 9	Source Free Parallel RLC Circuit
Week 10	Step Response of Series RLC Circuit
Week 11	Step Response of Parallel RLC Circuit
Week 12	Introduction to Three-Phase Circuits
Week 13	Balanced Wye - Wye Connection
Week 14	Balanced Wye-Deltaو Delta-Wye, Delta-Delta Connections
Week 15	Power in Balanced System and Unbalanced 3-phase Systems
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	
Week 2	

Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Charles K. Alexander, Matthew N. O. Sadiku "Fundamentals of Electric Circuits" Fifth edition.	No
Recommended Texts	James W. Nilsson, Susan A. Riedel "Electric Circuits" Ninth edition	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electromagnetic Fields I			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE005				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UG2	Semester of Delivery		3
Administering Department		Electrical	College	College of Engineering	
Module Leader	Ahmed A. Abbas		e-mail	Ahmed.abbas@uoanbar.edu.iq	
Module Leader's Acad. Title		Assist.prof.Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		30/oct/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG004	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is designed for students to understand vector analysis, Coulomb's law and electric field intensity, Electric flux density, Gauss's law and divergence, Energy and potential.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the fundamental of vector concepts and operation. 2. Understand the Coulomb's law and electric field intensity. 3. Understand the electric flux density, Gauss's law, divergence and the divergence theorem. 4. Use Coulomb's law and Gauss's law to find the electric field about many distributions of charge.
Indicative Contents المحتويات الإرشادية	● The fundamental of vector concepts and operation. ● The Coulomb's law and electric field intensity. ● The electric flux density, Gauss's law, divergence and the divergence theorem. ● Coulomb's law and Gauss's law to find the electric field about many distributions of charge.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
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	3	10% (10)	5, 10	LO# 2, LO# 3and LO# 4
	Assignments	2	5% (5)	2, 12	LO# 2and LO# 4
	Projects / Lab.	1	10% (10)		
	Report	1			
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO# 1 and LO# 2
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Vector analysis, scalars and vectors, vector algebra, the Cartesian coordinates system,
Week 2	Vector components and unit vector, the vector field.
Week 3	The dot products, the cross product, other coordinates system: circular cylindrical coordinates, the spherical coordinates system.
Week 4	The experimental law of Coulomb, Electric field intensity, field due to continuous volume charge distribution.
Week 5	Field of line charge, field of a sheet charge.
Week 6	Electric flux density, Gauss's law, Application of Gauss's law: some symmetrical charge distributions.
Week 7	Application of Gauss's law: some symmetrical charge distributions.
Week 8	Midterm Exam
Week 9	Application of Gauss's law: Differential volume element, divergence, Maxwell s first equation (Electrostatics filed).
Week 10	The vector operator and the divergence theorem.
Week 11	Energy expended in moving a point charge in electric field, line integral, definition of potential difference and potential.
Week 12	Potential field of point charge.
Week 13	The potential field of a system of charges.
Week 14	Potential Gradient, the Dipole.
Week 15	Energy density in the electrostatic field.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	William H. Hayt, Jr and Jone A. Buck “Engineering Electromagnetics” 6th Edition.	Yes
Recommended Texts		
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	English Language II			**Module Delivery**	
Module Type	S			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOA 004				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		UG2	**Semester of Delivery**		Three
Administering Department		EE	**College**	Engineering	
Module Leader	Abdullah Khalid Ahmed		**e-mail**	Abdullahkhalid.ahmed@uoanbar.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc.
Module Tutor			**e-mail**		
Peer Reviewer Name		Dr. Ehsan Hamyan Sabbar	**e-mail**	Ehsan.sabbar@uoanbar.edu.iq	
Scientific Committee Approval Date		01/11/2025	**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	English Language I	**Semester**	2
Co-requisites module	None	**Semester**	-

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

Module Aims
أهداف المادة الدراسية

1. Expand vocabulary and enhance communication in everyday situations.
2. Improve grammar skills for more accurate speaking and writing.
3. Develop better listening comprehension abilities.
4. Enhance spoken English fluency, accuracy, and pronunciation.
5. Improve reading comprehension and extract key information from texts.
6. Strengthen writing skills for well-structured and grammatically accurate compositions.
7. Increase cultural awareness of English-speaking societies and customs.

Module Learning Outcomes
مخرجات التعلم للمادة الدراسية

By the end of successful completion of this course, the student will be able to:

1. Develop academic essay writing proficiency
2. Promote reading skills
3. Expand academic vocabulary through reading
4. Promote speaking ability through group discussions and debates
5. Promote critical thinking skills

Indicative Contents
المحتويات الإرشادية

Indicative content includes the following.

- ☐ Tenses
- ☐ Vocabulary (Jobs)
- ☐ Present simple
- ☐ Present continuous
- ☐ Past simple
- ☐ Past continuous
- ☐ Count and uncount nouns
- ☐ Expression of quantity
- ☐ Verb patterns
- ☐ Would like and like
- ☐ What … like?
- ☐ Comparative and superlatives
- ☐ Present perfect
- ☐ Tense revision
- ☐ have to & got to
- ☐ have to & should & must
- ☐ Present simple or will
- ☐ Conditional clauses
- ☐ Verb patterns
- ☐ Used to
- ☐ The passive form
- ☐ Active and passive
- ☐ Second conditional
- ☐ Question forms
- ☐ Writing (informal letter)
- ☐ Have/have to
- ☐ Writing (Linking words +Describing a person)
- ☐ Have + noun
- ☐ Writing (a story 1)
- ☐ Articles
- ☐ Vocabulary (clothes)
- ☐ Writing (filling in forms)
- ☐ Will and going to
- ☐ Writing (postcard)
- ☐ Vocabulary (adjective formation)
- ☐ Writing (relative closes)
- ☐ Vocabulary (men and women)
- ☐ Writing (a biography)
- ☐ Vocabulary (job description)
- ☐ Writing (formal letter)
- ☐ Time clauses
- ☐ Writing (discussing ideas)
- ☐ Infinitives
- ☐ Writing (formal letters)
- ☐ Vocabulary (words with more than one meaning)
- ☐ Writing (email)
- ☐ Vocabulary (phrasal verbs)

	☐ Might	☐ Writing (a story 2)

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, speaking interactive activities and by considering type of activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	20	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.3
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**	**5**	**25% (25)**	**5, 10**	**LO #1, and 2**
	Assignments (HW)	**2**	**5% (5)**	**2, 4, 6, 8, 9, and 10**	**LO # 1-3**
	Report	**1**	**5% (5)**		
	Activities		**5% (5)**	**Through lectures**	**LO# 4**
	Lab				
Summative Assessment	**Midterm Exam**	**2 hr**	**10% (10)**	**7**	**LO # 1-3**
	Final Exam	**3 hr**	**50% (50)**	**16**	**All**
Total Assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
1.	• Tenses • Using a bilingual dictionary • Questions • Social expressions-1
2.	• Present tenses • Collection: daily life • Have/ have got • Making conversation
3.	• Past tenses • Time expressions • Word formation • Personal information
4.	• Much/ many- • a few, a little, a lot of • Shopping • some/ any • Articles • Prices
5.	• Verb patterns-1 • Hot verbs • Future forms • How do you feel?
6.	• What ……. Like? • Synonyms and antonyms • Comparatives and superlatives • Directions
7.	**Mid-term Exam**
8.	• Present perfect • Adverbs word pairs • For, since • Short answers
9.	• Have (go) to • Words that go together • Should/ must • At the doctor's
10.	• Time clauses • Hot verbs • If • In the hotel
11.	• Verb patterns-2 • -ed/ -ing adjectives • Manage to, used to • Exclamations
12.	• Passives • Notices • Verbs and nouns that go together • Adverbs

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	**Material Covered**
13.	• Second conditional • Might • Phrasal verbs • Social expressions-2
14.	• Present perfect continuous • Word information • Present perfect simple vs. continuous • Writing letters
15.	• Past perfect for clarification • Hot verbs • Reported statements • Saying goodbye
16.	**Final Exam preparatory**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	-John & Liz Soars, "New Headway Plus- Pre-Intermediate Student's Book", 10th ed 2012	Yes
Recommended Texts	-Raymond Murphy; "English Grammar in Use", 4th edition 2012 Understanding and Using English Grammar, Vol. A, 4th Edition 4th Edition	No
Websites	https://elt.oup.com/catalogue/items/global/adult_courses/new_headway/pre-intermediate_fourth_edition/?cc=global&selLanguage=en&mode=hub https://www.amideast.org/jordan/learn-english/learn-english-online?gclid=EAIaIQobChMIoeyGmdm_ggMVFweLCh2FowJ1EAAYASAAEgKjFfD_BwE	

	https://learnenglish.britishcouncil.org/

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.

Module Approval المصادقةعلى وصف المادة الدراسية			
	Name	**Date**	**Signature**
Module Leader Approval		**8/6/2023**	
Peer Reviewer Name		**8/6/2023**	
Scientific Committee Members Approval		**8/6/2023**	
		8/6/2023	
		8/6/2023	
		8/6/2023	
		8/6/2023	
Scientific Committee Head Approval		**8/6/2023**	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Fundamentals of Electronics I			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE007				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UG2	Semester of Delivery		3
Administering Department		Electrical	College	College of Engineering	
Module Leader	Hamid raddam		e-mail	hamid.radam@uoanbar.edu.iq	
Module Leader's Acad. Title		M_{SC}	Module Leader's Qualification		Master
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		30/oct/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE001	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The goals of this course are to enable students to: 1) Explanation of the physical structure of the semiconductors. 2) Analysis of a pn diode operation, description of the device characteristics 3) Investigation of diode circuits and applications 4) Analysis of a BJT, description of device characteristics 5) Definition of DC biasing circuits of BJTs, distinguishing the differences between circuits
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. After successfully completing the course, the students will be able to: 2. Apply mathematics, science, and engineering to analyze and design electronic circuits 3. Identify, formulate, and solve engineering problems in the area circuits and systems. 4. Identify and characterize different semiconductor devices (P-N Junction and BJT) 5. explain different diode and transistor applications (clipping, clamping, amplifier, ...) 6. Analyze and design different electronic circuits contain semiconductor devices using devices' models. 7. understand the design parameters and different characteristics of small signal BJT amplifiers.
Indicative Contents المحتويات الإرشادية	• Introduction to Electronic devices and systems. • Construction of pn Diodes, BJT, FET and other Devices. • Characteristics and operation Principals of Electronics Devices. • Practical applications of pn Diodes, BJT, FET and others Devices. • DC and AC Biasing and analysis of electronic circuits.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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	3	10% (10)	5, 10	LO# 2, LO# 3and LO# 5
	Assignments	2	5% (5)	2, 12	LO# 3and LO# 4
	Projects / Lab.	1	10% (10)		LO# 2, LO# 3and LO# 5
	Report	1			
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO# 1 to LO# 4
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Semiconductor Materials and PN Junction
Week 2	Forward biased, Reversed biased, and I-V. Relationship
Week 3	Diode and Zener diode circuits: DC analysis, models and applications
Week 4	Bipolar junction transistor Introduction
Week 5	Transistor Structure
Week 6	biasing, and I-V Relationship
Week 7	DC analysis of transistor circuits- Part I
Week 8	DC analysis of transistor circuits -Part II
Week 9	Basic transistor applications: Switch, Digital Logic, etc
Week 10	Basic transistor amplifier configuration
Week 11	Design and applications
Week 12	Bias Stabilization
Week 13	Field Effect Transistors (FETs): Structure and Operation of JFET
Week 14	P-Channel, N-Channel,
Week 15	Enhancement-Mode, Depletion-Mode MOSFETs
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	**electronics I lab:**1-Lab Equipment Familiarization
Week 2	**electronics I lab:2**-Diode Characteristics and

Week 3	**electronics I lab:3**-Diode Applications (1)
Week 4	**electronics I lab:4**-Diode Applications (2)
Week 5	**electronics I lab:5**-Zener Diode Characteristic
Week 6	**electronics I lab:6**-Zener Diode Applications
Week 7	**Electronics 1lab:7-**Emitting Light Diode

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• Robert L. Boylestad and Louis Nashelsky, “Electronic Devices and Circuit Theory”, 11th edition, Pearson, 2013.	No
Recommended Texts	•Robert L. Boylestad and Louis Nashelsky, “Electronic Devices and Circuit Theory”, 10th edition, Pearson, 2013.	No
Websites		

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 &
Scientific Research
University of Anbar
College of Engineering
Electrical Engineering Department

مفردات المنهج لمادة

جرائم حزب البعث

قسم الهندسة الكهربائية

للعام الدراسي 2023-2024

مقدمة :

Ministry of Higher Education & Scientific Research
University of Anbar
College of Engineering
Electrical Engineering Department

بناءا على التوجيهات الصادرة من عمادة كلية الهندسة ورئاسة الجامعة والتوجيهات المركزية من وزارة التعليم العالي والبحث العلمي بخصوص المفردات والخطة الدراسية لمادة جرائم حزب العث في العراق. ادناه المنهاج الدراسي الاكمل للمادة والذي يتضمن:

1- **المفردات الدراسية.**
2- **الخطة الدراسية المتبعة.**
3- **عدد الساعات المخصصة.**
4- **أسماء التدريسيين المكلفين بالمادة.**

- **المفردات الدراسية لمادة جرائم حزب البعث في العراق**

ت	المفردات الدراسية	الوصف
1	المقدمة	مقدمة عامة عن المنهج
2	الفصل الاول	جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005 م
3	الفصل الثاني	الجرائم النفسية والاجتماعية وأثارها، وأبرز انتهاكات النظام البعثي في العراق
4	الفصل الثالث	الجرائم البيئية لنظام البعث في العراق
5	الفصل الرابع	جرائم المقابر الجماعية

- **الخطة الدراسية لمادة جرائم حزب البعث**

ت	وصف مادة المحاضرة	الاسبوع	نوع المحاضرة
1	▪ مقدمة عامة عن المنهج ▪ جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005 م أقسام الجرائم. ▪ مفهوم الجرائم واقسامها. ▪ تعريف الجريمة لغة واصطلاحا.	الأول	نظري حضوري
2	▪ جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005 ▪ أنواع الجرائم الدولية ▪ القرارات الصادرة من المحكمة الجنائية العليا.	الثاني	نظري حضوري
3	▪ الجرائم النفسية والاجتماعية وأثارها، وأبرز انتهاكات النظام البعثي في العراق. ▪ الجرائم النفسية . ▪ آليات الجرائم النفسية . ▪ آثار الجرائم النفسية .	الثالث	نظري حضوري

4	▪ الجرائم الاجتماعية ▪ عسكرة المجتمع . ▪ موقف النظام البعثي من الدين	الرابع	نظري حضوري
5	▪ انتهاكات القوانين العراقية.	الخامس	نظري حضوري
6	▪ صور انتهاكات حقوق الإنسان وجرائم السلطة -1 .	السادس	نظري حضوري
7	الامتحان الشهري الاول	السابع	امتحان حضوري
8	▪ صور انتهاكات حقوق الإنسان وجرائم السلطة -2 ▪ بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث . ▪ أماكن السجون والاحتجاز لنظام البعث .	الثامن	نظري حضوري
9	▪ الجرائم البيئية لنظام البعث في العراق . ▪ التلوث الحربي والإشعاعي وانفجار الالغام	التاسع	نظري حضوري
10	▪ تدمير المدن والقرى (سياسة الأرض المحروقة)	العاشر	نظري حضوري
11	▪ تجفيف الأهوار ▪ تجريف بساتين النخيل والأشجار والمزروعات	الحادي عشر	نظري حضوري
12	▪ جرائم المقابر الجماعية ▪ أحداث مقابر الإبادة الجماعيةّ المرتكبة من النظام البعثي في العرا ق	الثاني عشر	نظري حضوري
13	▪ التصنيف الزمني لمقابر الإبادة الجماعيةّ في العراق للمدة 1963 م – 2003 م.	الثالث عشر	نظري حضوري
14	▪ التصنيف الزمني لمقابر الإبادة الجماعيةّ في العراق للمدة 1963 م – 2003 م.	الرابع عشر	نظري حضوري
15	الامتحان الشهري الثاني	الخامس عشر	نظري حضوري
16	الامتحان النهائي	السادس عشر	نظري حضوري

- **عدد الساعات المخصصة وجدول المادة:**
  - **عدد الساعات هي 2 ساعة أسبوعيا.**
  - **عدد الساعات الكلية في الفصل هي 30 ساعة.**
  - **الجدول الأسبوعي:**

Ministry of Higher Education & Scientific Research
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College of Engineering
Electrical Engineering Department

الجـــدول الأسبوعـــي للمحاضرات

للفصـــل الدراســـي الاول للعـــــام 2023- 2024

المـــــرحلة: الثانية- شعبة A

اليوم	موعد المحاضرة	اسم المادة	اسم التدريسي
الأحد	08:30am - 11:00am	Digital Techniques I	م.د. زياد طارق إبراهيم
	11:00am - 01:30pm	English Language II	م.د. حامد ردام حسين
	01:30pm - 03:00pm	Fundamentals of Electronics I	م. عبدالله خالد احمد
الاثنين	08:30am - 11:00am	Calculus III	د. محمد عبدالرحمن فرج
	11:00am - 01:30pm	Electromagnetic Fields I	ا.م.د. احمد عبداللطيف عباس
	01:30pm - 02:30pm	-	-
الثلاثاء	08:30am - 11:00am	LAB21 Electronics	المهندس عمر عبدالله حمود, م.م. سامح جسام محمد , م.م. شهد فاضل جابر , م.م. مصطفى لطيف حسن
	11:00am - 01:30pm	LAB21 DC Machines	المهندس مصطفى محمد كريم, م.د. ستار صبري كريم, م.م. عبدالله فوزي شفيق, م.م. ياسمين كامل نجم
	01:30pm - 02:30pm	-	-
الأربعاء	08:30am - 10:30am	جرائم حزب البعث	م.د. ماجد هادي طلال
	10:30am - 12:30pm	Calculus III	د. محمد عبدالرحمن فرج
	12:30pm - 02:30pm		-
الخميس	08:30am - 11:00am	Electric Circuits I	م.د. مشتاق نجيب احمد
	11:00am - 01:30pm	DC Machines I	م.د. ستار صبري كريم
	01:30pm - 02:30pm	-	-

المـــــرحلة: الثانية- شعبة B

اليوم	موعد المحاضرة	اسم المادة	اسم التدريسي
الأحد	08:30am - 11:00am	Fundamentals of Electronics I	م.د. حامد ردام حسين
	11:00am - 01:30pm	Digital Techniques I	م.د. زياد طارق إبراهيم
	01:30pm - 02:30pm	Engineering Mechanics (Static)	م.د. احسان احميان صبار
الاثنين	08:30am - 11:00am	Electromagnetic Fields I	ا.م.د. احمد عبداللطيف عباس
	11:00am - 01:30pm	Calculus III	د. محمد عبدالرحمن فرج
	01:30pm - 02:30pm	-	-
الثلاثاء	08:30am - 11:00am	Electric Circuits I	م.د. مشتاق نجيب احمد
	11:00am - 01:30pm	DC Machines I	م.د. ستار صبري كريم
	01:30pm - 02:30pm	-	-
الأربعاء	08:30am - 10:30am	Calculus III	د. محمد عبدالرحمن فرج
	10:30am - 12:30pm	جرائم حزب البعث	م.د. ماجد هادي طلال
	12:30pm - 02:30pm	English Language II	م. عبدالله خالد احمد
الخميس	08:30am - 11:00am	LAB21 Electronics	المهندس عمر عبدالله حمود, م. زينب نجيب عبد الحميد, م.د. حامد ردام حسين, م.م. براء سعيد علي, م.م. سامح جسام محمد , م.م. شهد فاضل جابر , م.م. مصطفى لطيف حسن
	11:00am - 01:30pm	LAB21 DC Machines	المهندس مصطفى محمد كريم, م.د. ستار صبري كريم, م.م. خالد وليد عبد, م.م. عبدالله فوزي شفيق
	01:30pm - 02:30pm	-	-

- **أسماء التدريسيين المكلفين بتدريس المادة:**

1- م.د. ماجد هادي طلال

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Statistics			Module Delivery	
Module Type	Related			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ENG010				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UG2	Semester of Delivery		4
Administering Department		Electrical	College	College of Engineering	
Module Leader	Mohammed A.Faraj		e-mail	Mohammed.Faraj@uoanbar.edu.iq	
Module Leader's Acad. Title		Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		30/SEP/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG08	Semester	3
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Statistical Engineering models are based on mathematics and probability theory. This course provides students with a working knowledge of fundamental statistics principles and probability in addition to a preface to the regression and correlation analysis. By the end of the semester, students should be able to determine when each of the various topics we have covered is appropriate to use, and to apply them to practical engineering situations or problems. This course will cover techniques on data collection and presentation, descriptive statistics, basic elements of probability theory, sampling techniques and theory, statistical estimation, hypothesis testing and regression analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. use a number of methods and techniques for collecting and presentation the sets of data; 2. calculation and demonstration the center tendency and variation of data; 3. compute the probabilities in a simple case and using the rules of probability in computing; 4. give an account of the concept random variable and be able to use some common probability distributions; 5. understand the meaning of the central limit theorem; 6. use point and interval estimates for some typical statistical problems; 7. • apply elementary regression for fitting measured data.
Indicative Contents المحتويات الإرشادية	Fundamentals (Introduction to Statistics) • Introduction • Descriptive and Inferential Statistics • Variables and Types of Data • Data Collection and Sampling Techniques • Observational and Experimental Studies Presentation of a Statistical Data • Introduction • Organizing Data • Grouped Frequency Distributions or Frequency Distributions Table • Graphs: Histograms, Frequency Polygons, and Ogive • Other Types of Graphs Data Description • Measures of Central Tendency (Mean, Median and Mode) • Measures of Variation - 2.1. Population Variance and Standard Deviation - 2.2. Sample Variance and Standard Deviation - 2.3. Variance and Standard Deviation for Tabulated Data - 2.4. Range • Coefficient of Variation Probability and Counting Rules • Sample Spaces and Probability • Tree diagram • Basic Probability Rules • Venn Diagram • The Addition Rules for Probability • The Multiplication Rules and Conditional Probability • Conditional Probability

	• Counting Rules - 8.1. Permutations - 8.2. Combinations • Probability and Counting Rules Discrete Probability Distributions • Probability Distributions • Mean, Variance, Standard Deviation • The Binomial Distribution • The Poisson Distribution Continuous Probability Distributions: The Normal Distribution • Normal Distributions • Applications of the Normal Distribution • Normal Distributions Formula • The Standard Normal Distribution • Finding Areas Under the Standard Normal Distribution Curve (Table Method) • A Normal Distribution Curve as a Probability Distribution Curve • Applications of the Normal Distribution • Determining Normality • The Normal Distribution Approximation to the Binomial Distribution Confidence Intervals and Sample Size • Preface • Confidence Intervals for the Mean When σ is Known - 2.1. A point estimate - 2.2. An interval estimate - 2.3. Confidence Intervals • Sample Size • t-Distribution • Confidence Intervals for the Mean When σ is Unknown • The chi-square Distribution • Confidence Intervals for Variances and Standard Deviations - Confidence Interval for a Variance - Confidence Interval for a Standard Deviation Hypothesis Testing • Preface • Steps in Hypothesis Testing—Traditional Method - The null hypothesis (H0) - The alternative hypothesis (H1) - The level of significance • z Test for a Mean • P-Value Method for Hypothesis Testing • t Test for a Mean • z Test for a Proportion • X2 Test for a Variance or Standard Deviation Testing the Difference Between Two Means, Two Proportions, and Two Variances • Preface • Testing the Difference Between Two Means: Using the z Test • Testing the Difference Between Two Means of Independent Samples: Using the t Test

	• Testing the Difference Between Two Means: Dependent Samples • Testing the Difference Between Two Variances Correlation and Regression • Preface • Scatter Plots and Correlation • Regression • Coefficient of Determination and Standard Error of the Estimate.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	147		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25% (10)	1,35, 10,11.13	LO# 2, LO# 3and LO# 5
	Assignments	2	5% (5)	2, 12	LO# 3and LO# 5
	Projects / Lab.	1	%5		
	Report	1	5% (5)		
Summative assessment	Midterm Exam	2hr	10% (15)	8	LO# 2 to LO# 4
	Final Exam	3hr	50% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction: basic probability
Week 2	Conditional probability, independent events
Week 3	Principle of counting, permutations, combinations, binomial coefficient
Week 4	Random variables and probability distributions
Week 5	Graphical interpretations, joint distributions
Week 6	Mathematical expectation,
Week 7	Variance and standard deviation,
Week 8	Midterm Exam
Week 9	Correlation coefficient, skewness and kurtosis
Week 10	Percentiles, mean, median, mode
Week 11	Examples
Week 12	Exam
Week 13	Binomial distribution,
Week 14	Normal distribution,
Week 15	Examples
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	

Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• Probability & Statistics for Engineers & Scientists. 9th edition. by Walpole et.al.	No
Recommended Texts	• Statistics for Engineers and Scientists. 4th edition. by Navidi • Schaum's Outline Probability and Statistics 4th edition. by Spiegel et.al.	No
Websites		

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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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.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Calculus IV			**Module Delivery**	
Module Type	B (Basic learning activities)			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENG009				
ECTS Credits	6				
SWL (hr/sem)	150 (Student Workload)				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Electrical Engineering		**College**	College of Engineering	
Module Leader	Abdullah Fawzi Shafeeq		**e-mail**	abdullah.fawzi@uoanbar.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ms.c	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	01/09/2025		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG008	**Semester**	3
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of engineering Mathematics. Specifically, the concepts of all types of differential equations, Laplace transform, inverse Laplace transform, how we solve the differential equation by using Laplace converter, Fourier series, and complex Fourier series.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course students will be able to: • Classify differential equations by order, linearity, and homogeneity • Solve all type of first order differential equations • Solve all type of second order differential equations • Determined the Laplace transform • Determined the inverse Laplace transform • Solve all type differential equations by using Laplace transform • Determined the Fourier series for the periodic function
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Ordinary differential Equations: Classify differential equations by order, linearity, and homogeneity 2. First order linear differential equations: use separation of variables to solve differential equations, solve exact differential equations, use variation of parameters to solve differential equations, solve first order linear differential equations. 3. Higher order Differential Equations: Solutions of Homogeneous Linear D.E with constant coefficients, Solutions of Inhomogeneous Linear D.E with constant coefficients, The Method of Undetermined Coefficients, Method of Variation of Parameters. 4. Laplace Transform : Determined the Laplace and inverse Laplace transform for all types of function, solve the differential equation by using Laplace transform. 5. Fourier series: Periodic functions, Trigonometric series, Bounds of a Function,

	Continuity of a Function, Euler Coefficients, Even and Odd Functions, Half Range Expansion

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage student's 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 some activities that are interesting to the students.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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**	5	25% (25)	3,6,9,11, and 13	
	Assignments	2	5% (5)	4 and 12	
	Activities	1	5% (5)	7	
	Report	1	5% (5)	12	
Summative assessment	**Midterm Exam**	2hr	10% (10)	9	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Ordinary differential Equations
Week 2	First order linear differential equations
Week 3	First order linear differential equations
Week 4	Second order linear differential equations
Week 5	Second order linear differential equations
Week 6	Higher order Differential Equations
Week 7	MID Exam
Week 8	Laplace Transform
Week 9	Laplace Transform
Week 10	Inverse Laplace Transform
Week 11	Inverse Laplace Transform
Week 12	Solve Differential Equations by using Laplace Transform
Week 13	Solve Differential Equations by using Laplace Transform
Week 14	Fourier Series
Week 15	Fourier Series
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas' Calculus Early Transcendentals 12th Edition.by George B. Thomas Jr. (Author), Maurice D. Weir (Author), Joel R. Hass (Author).	Yes
Recommended Texts	Advanced Engineering Mathematics 10th Edition by Erwin Kreyszig (Author), Herbert Kreyszig (Author), Edward J. Norminton (Author)	Yes
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Science II**			**Module Delivery**	
Module Type	**Related**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOA008**				
ECTS Credits	**3**				
SWL (hr/sem)	**100**				
Module Level		UG2	**Semester of Delivery**		2
Administering Department		Electrical	College	College of Engineering	
Module Leader	Ahmed Jamal Ahmed		**e-mail**	Ahmed.j.ahmed@uoanbar.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		10/01/2026	**Version Number**		2.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1-Utilize the computer for fundamental tasks. 2-Identify and discuss the hardware components of the computer system. 3-creating documents using word processor and creating presentation. 4-Conducting research on the internet. 5-An introduction to Artificial Intelligence.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Analyze, design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs. 2. Identify problems and formulate solutions for systems. 3. Communicate effectively with a range of audience. 4. Work effectively as part of a team to develop and deliver quality software artifacts. 5. Design solutions using approaches that integrate ethical, social, legal, and economic responsibilities. 6. An Introduction to Security and Network. 7. An introduction to AI, Applications, Future of AI.
Indicative Contents المحتويات الإرشادية	- Introduction of Network - Network security - Computers - AI introduction, applications, in our daily lives

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 type of simple experiments involving some sampling activities that are interesting to the students.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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**	5	25% (25)	3,5,9, 11,13	LO #1, 2, 10 and 11
	Assignments	2	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.		6% (4)	Continuous	
	Activities		4% (6)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	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	Security and Network: what is a network? Type of network. Basic network components.
Week 2	Network security basics. Understanding network threats. Network troubleshooting.
Week 3	Lab Network
Week 4	E-Commerce: Concepts of electronic banking services include online banking: ATM and debit card services, phone banking. SMS banking, electronic alert, Mobile banking
Week 5	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues
Week 6	Introduction to AI: Definition of AI, History of AI, AI Techniques and approaches, Challenges and Ethical consideration

Week 7	**Mid – term Exam**
Week 8	AI in our daily lives: AI in smartphones and virtual assistants like Siri or Google Assistant.
Week 9	Lab Computer Hardware and Software
Week 10	Application of AI: Education, Healthcare, Finance, Transportation, Marketing and Advertising.
Week 11	Lab AI applications
Week 12	AI and Society: (how AI affects social, AI and international relations, AI and the future of humanity)
Week 13	Ethical Challenges in AI:(AI Ethics, Privacy and surveillance, the impact of AI on the job market)
Week 14	Lab AI
Week 15	The Future of AI (Future trends in AI, recent research and emerging technologies)
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction of Network
Week 2	Lab 2: Computer Hardware and Software
Week 3	Lab 3: introduction of AI
Week 4	Lab 4: AI Applications
Week 5	Lab 5: AI using Siri and Google Assistant
Week 6	Lab 6: AI challenge
Week 7	Lab 7: Future of AI

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1-Graham Brown, David Watson, “Cambridge IGCSE Information and communication technology”, 3rd edition (2020) 2-Alan Evans, Kendall Martin, Mary Anne Poatsy, “Technology in action complete”, 16th edition(2020). 3-Ahmed Banafa, “Introduction to Artificial Intelligence (AI)”, 1st Edition (2024). 4-2016"اساسيات الحاسوب" بحاث الخضر على الخضر	Yes

	الدكتور عادل عبدالنور, مدخل الى عالم الذكاء الاصطناعي"2005-5	
Recommended Texts		
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	DC Machines II			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE016				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UG2	Semester of Delivery		4
Administering Department		Electrical	College	College of Engineering	
Module Leader	Settar Subry Keream		e-mail	Settar.keream@uoanbar.edu.iq	
Module Leader's Acad. Title		Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		30/oct/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE015	Semester	3
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of DC machines. Specifically, the Dc motors, , BLDC motors and transformers
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. # Understand the speed control of DC motors, braking and starting of DC motors. 2. # Understand the principle of brushless DC motor . and transformers
Indicative Contents المحتويات الإرشادية	● MOTOR OPERATION: Governing equations, Load: torque and current, Applied voltage, Field excitation, Mechanical characteristic, Stability ● Speed control: Armature voltage control, Armature resistance control, Field control, ● Starting: Direct on-line starting, Variable voltage starting, Resistance starting, Starters, ● Braking: External braking, Electric braking, Applications. ● Brushless DC motor principle of operation ● Transformer principle: Single phase transformer, three phase transformers. ● types of transformer, construction, no-load and short circuit tests and efficiency

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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	3	10% (10)	5, 10	LO# 1and LO# 2
	Assignments	2	5% (5)	2, 12	LO# 1and LO# 2
	Projects / Lab.	1	10% (10)		LO# 1and LO# 2
	Report	1			LO# 1and LO# 2
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO# 1and LO# 2
	Final Exam	3hr	60% (60)	16	LO# 1and LO# 2
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	MOTOR OPERATION: Governing equations, Load: torque and current,
Week 2	Applied voltage, Field excitation, Mechanical characteristic, Stability
Week 3	Speed control: Armature voltage control, Armature resistance control, Field control,
Week 4	Midterm Exam
Week 5	Starting: Direct on-line starting, Variable voltage starting,
Week 6	Resistance starting, Starters,
Week 7	Braking: External braking,
Week 8	Electric braking,
Week 9	Applications.
Week 10	Brushless DC motor principle of operation,
Week 11	construction Applications
Week 12	Transformer principle: Single phase transformer, Transformer-types of transformer, construction, no-load and short circuit tests.
Week 13	losses in transformers, the equivalent circuit of the transformer, efficiency, regulation, auto-transformer.
Week 14	Three phase transformers, Efficiency and maximum efficiency condition of transformer.
Week 15	Parallel operation of transformer.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered

Week 1	LAB1: Connection & rotation direction of DC shunt wound machines operating as motor
Week 2	LAB2: Speed control of a DC shunt motor
Week 3	LAB3: Load characteristic of separately – excited shunt – wound DC motor
Week 4	LAB4: Connection & rotation direction of DC series wound machines operating as motor
Week 5	LAB5: Load characteristic of series – wound DC moto
Week 6	LAB6: Load characteristic of Shunt and compound DC moto
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Theraja and Theraja (A Textbook of Electrical Technology) volume I basic electrical engineering in S.I. System of units revised by: Tarnekar Chand an ISO 9001:2000 company Chand & company ltd. Ram Nagar (2005)	yes
Recommended Texts		
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electric Circuits II			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE004				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UG2	Semester of Delivery		4
Administering Department		Electrical	College	College of Engineering	
Module Leader	Mushtaq Najeeb Ahmed		e-mail	mushtaq.najeeb@uoanbar.edu.iq	
Module Leader's Acad. Title		Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		1/Feb/2026	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE003	Semester	3
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is a second course on electric circuits. The focus of the course is to impart useful skills on the students to enhance their circuit analysis capability. Hence, the course is designed to provide students with a knowledge on circuit analysis by Introducing the topic and illustrating its importance for electrical engineering field: Laplace transform and relation between current and voltage for resistance, capacitance and inductance, Laplace transform and its applications in electric circuit the concept of magnetic coupling, Analysis of magnetic coupled circuits, Linear transformers, Ideal transformers. Two-port networks and its different equation forms, Evaluation of its parameter, Interconnected two-port networks, Frequency response. High-pass, low-pass, Band pass, and Band-stop filters. Revision and a set of solved examples.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	● Laplace Transform Analysis of Circuits: ● The Laplace transform and its inverse. Properties: multiplication-convolution, differentiation, initial and final value theorems. Application of Laplace in Circuits in the s-domain: transfer function, impedance, circuit reduction, initial conditions. ● Mutual Inductance and Transformers: Mutual inductance. Coupling coefficient. Analysis of coupled coils. Dot rule. Energy in a pair of coupled coils. Conductively coupled equivalent circuits. Linear transformer. Ideal transformer. ● Autotransformer. Reflected impedance. ● Frequency Response, Filters ● Frequency response. High-pass and low-pass networks. Half-power frequencies. Band-pass filters and Band-stop filters. ● Two-Port Networks ● Terminals and ports, z-parameters. t-equivalent of reciprocal networks. y-parameters. ● Conversion between z and y parameters. h and g parameters. Transmission parameters. Interconnecting two-port networks.
Indicative Contents المحتويات الإرشادية	● Understand the basic properties of Laplace transform and its application to electric circuits. ● Analyze electrical networks using complex frequency approach and Laplace transform. ● Apply such approaches to magnetically coupled circuits and two port networks.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.133

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

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25%		LO# 2, LO# 5and LO# 9
	Assignments	1	5 %		LO# 6 and LO# 8
	Activities	1	5 %		LO# 4, LO5 5and LO# 6
	Report	1	5 %		LO# 7
Summative assessment	Midterm Exam	1hr	10 %		LO#1 to LO# 7
	Final Exam	3hr	50 %		all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to Magnetically Coupled Circuits and Mutual Inductance
Week 2	Energy in a Coupled Circuit
Week 3	Explanation of Linear Transformer
Week 4	Concept of Ideal Transformer
Week 5	Concept of Ideal Autotransformer and Three-Phase Transformers
Week 6	Concept of Series and Parallel Resonance
Week 7	Passive Filters (Lowpass, Highpass, Bandpass, and Bandstop)
Week 8	Active Filters (Lowpass, Highpass, Bandpass, and Bandreject)
Week 9	Introduction to Laplace Transform and Its Properties
Week 10	Inverse Laplace Transform
Week 11	Circuit Element Models (Laplace Transform Applications)
Week 12	Circuit Analysis and Transfer Functions (Laplace Transform Applications)
Week 13	Tow-port Networks (Impedance Parameters)
Week 14	Tow-port Networks (Admittance Parameters)
Week 15	Tow-port Networks (Transmission Parameters)
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	

Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Charles K. Alexander, Matthew N. O. Sadiku "Fundamentals of Electric Circuits" Fifth edition.	No
Recommended Texts	James W. Nilsson, Susan A. Riedel "Electric Circuits" Ninth edition	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electromagnetic Fields II			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE006				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UG2	Semester of Delivery		4
Administering Department		Electrical	College	College of Engineering	
Module Leader	Ahmed A. Abbas		e-mail	Ahmed.abbas@uoanbar.edu.iq	
Module Leader's Acad. Title		Assist. prof. Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		30/nov/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE005	Semester	3
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is designed for students to understand current and conductors dielectrics and capacitance, Poisson's and Laplace's equations, the steady magnetic field, Magnetic forces, materials and inductance, Time-varying fields and Maxwell's equations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. . Understand the current and current density and continuity of current. 2. Understand the metallic conductor, conductor properties and boundary conditions and semiconductor. 3. Understand the dielectric materials and capacitance. 4. Understand the relationship between the potential and electric fields. 5. Use Laplace and Poisson equations to find potential fields within regions bounded by the charge density. 6. Understand the steady magnetic field. 7. Understand the magnetic force, materials and inductance. 8. Understand the time-varying field and Maxwell equations
Indicative Contents المحتويات الإرشادية	● The current and current density and continuity of current. ● The metallic conductor, conductor properties and boundary conditions and semiconductor. ● The dielectric materials and capacitance. ● The relationship between the potential and electric fields. ● Laplace and Poisson equations to find potential fields within regions bounded by the charge density. ● The steady magnetic field. ● The magnetic force, materials and inductance. ● The time-varying field and Maxwell equations

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
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	3	10% (10)	5, 10	LO# 2, LO# 4and LO# 7
	Assignments	2	5% (5)	2, 12	LO# 3and LO# 4
	Projects / Lab.	1	10% (10)		
	Report	1			
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO# 3 to LO# 6
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Current and current density, continuity of current, metallic conductors,
Week 2	Conductor properties and boundary conditions, semiconductors.
Week 3	The nature of dielectric materials, boundary conditions for perfect dielectric materials.
Week 4	Boundary conditions for perfect dielectric materials, capacitance.
Week 5	Poisson and Laplace equations, derivation of Poisson and Laplace equations, examples of solution of Poisson and Laplace equations.
Week 6	Biot- Savart law.
Week 7	Ampere law, curl.
Week 8	Midterm Exam
Week 9	Stokes theorem, magnetic flux and magnetic flux density.
Week 10	The scalar and vector magnetic potentials.
Week 11	Derivation of the steady –magnetic field laws, force on moving charge, force on differential current element.
Week 12	Force between differential current element, force and torque on a closed circuit.
Week 13	The nature of magnetic materials, magnetic boundary conditions, the magnetic circuit, potential energy and forces on magnetic materials.
Week 14	Faraday law, displacement current.
Week 15	Maxwell equation in point form, Maxwell equation in integral form, the retarded potentials.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	William H. Hayt, Jr and Jone A. Buck “Engineering Electromagnetics” 6th Edition.	Yes
Recommended Texts		
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Fundamentals of Electronics II				
Module Type	Core	☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar			
Module Code	ELE08				
ECTS Credits	4				
SWL (hr/sem)	125				
Module Level	2	Semester of Delivery	4		
Administering Department	Electrical	College	College of Engineering		
Module Leader	Hamid raddam	e-mail	hamid.radam@uoanbar.edu.iq		
Module Leader's Acad. Title	M_{SC}	Module Leader's Qualification	Master		
Module Tutor		e-mail			
Peer Reviewer Name		e-mail			
Scientific Committee Approval Date	30/oct/2025	Version Number	1.0		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE07	Semester	3
Co-requisites module	None	Semester	None

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The goals of this course are to enable students to: 1) Explanation of the physical structure of the semiconductors in AC domain. 2) AC Analysis of a pn diode operation, description of the device characteristics 3) Investigation of diode circuits and applications 4) AC Analysis of a BJT, description of device characteristics 5) Construction and DC biasing circuits of JFET and MOSFET . 6) AC Analysis and small signals Circuits of JFET's and MOSFET's.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. After successfully completing the course, the students will be able to: 2. Apply mathematics, , and engineering to the analyze and design electronic circuits 3. Identify, formulate, and solve engineering problems in the area circuits and systems. 4. Identify and characterize different semiconductor devices (P-N Junction, JFET, and MOSFET) 5. Understand different type of diode and JFET transistor applications. 6. Perform a DC and small Signal analysis of JFET, MOSFET, and MESFET networks. 7. Analyze and design different electronic circuits contain semiconductors using devices' models. 8. Understand the design parameters and different characteristics of small signal amplifiers.
Indicative Contents المحتويات الإرشادية	• Introduction to Electronic devices and systems in AC domain. • Construction and analysis of pn Diodes, BJT, FET and other Devices. • Characteristics and operation Principals of Electronics Devices. • Practical applications of pn Diodes, BJT, FET and others Devices. • AC Biasing and analysis of electronic circuits.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.2
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	3	10% (10)	5, 10	LO# 2, LO# 5and LO# 7
	Assignments	2	5% (5)	2, 12	LO# 5 and LO# 6
	Projects / Lab.	1	10% (10)		LO# 4, LO#5 and LO# 6
	Report	1			LO# 6
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO#1 to LO# 6
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Semiconductor Diodes (Logic Circuits)
Week 2	Semiconductor Diodes (Logic Circuits)
Week 3	Diode AC Applications
Week 4	Diode AC Applications
Week 5	Diode AC Applications
Week 6	BJT Transistor Modeling
Week 7	BJT Small – Signal Analysis
Week 8	BJT Small – Signal Analysis
Week 9	BJT Small – Signal Analysis
Week 10	FET Small – Signal Analysis
Week 11	Deplation – Type MOSFETs
Week 12	Enhancement – Type MOSFETs
Week 13	MOSFETs Transistor Aplication
Week 14	Small Signal Analysis of Field- Effect Transistor
Week 15	Small Signal Analysis of Field- Effect Transistor
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	**electronics II lab:**1- Characteristics of Bipolar Junction
Week 2	**electronics II lab:2**- Transistor DC Biasing Circuits

Week 3	**electronics II lab:3**- Logic Gate Circuits
Week 4	**electronics II lab:4**- Small Signal BJT Amplifier
Week 5	**electronics II lab:5**- JFET Characteristics
Week 6	**electronics II lab:6**- The FET Common Source Amplifier
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• Robert L. Boylestad and Louis Nashelsky, “Electronic Devices and Circuit Theory”, 11th edition, Pearson, 2013.	No
Recommended Texts	•Robert L. Boylestad and Louis Nashelsky, “Electronic Devices and Circuit Theory”, 10th edition, Pearson, 2013.	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Analog Communications and Noise			Module Delivery	
Module Type	C			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE013				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UG3	Semester of Delivery		5
Administering Department		Electrical	College	College of Engineering	
Module Leader	Mohammed Ali Hussein		e-mail	Mohammed.almahamdy@uoanbar.edu.iq	
Module Leader's Acad. Title		Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		30/sep/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE011	Semester	
Co-requisites module		Semester	5

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of communication system engineering. Specifically, the analog communication systems (AM and FM). The noise within the communication systems is also introduced.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand and analyze communication systems in both the time and frequency domains. 2- Understand the principles of amplitude and frequency modulations. 3- Understand the sources of the electrical noise and its roles on the communications.
Indicative Contents المحتويات الإرشادية	• Introduction to communication system, channel, waves propagation. • Amplitude Modulation: DSB-SC, DSB-LC, SSB, VSB. • FDM • Frequency Conversion, Super-Heterodyne Receiver • Frequency Modulation: power, bandwidth, generation, detection. • Introduction to the noise in communication systems. Noise Sources, Thermal Noise, White & Filtered Noise, Equivalent Temperature. • Noise & SNR in selected studied systems.

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 type of simple experiments involving some sampling activities that are interesting to the students.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
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	3	10% (10)	5, 10	1
	Assignments	2	5% (5)	2, 12	2,3
	Projects / Lab.				1,2
	Report	1	5% (5)		3
Summative assessment	Midterm Exam	2hr	20% (15)	8	1,2,3
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to Communication System, Channel; Signal Classification and Characteristics
Week 2	Introduction to Waves Propagation, Multipath
Week 3	Introduction to Fourier Transform, Filters & Bandwidth
Week 4	Amplitude Modulation Systems, AM-DSB-SC (Modulation/Demodulation)
Week 5	AM-DSB-LC (Modulation-Demodulation)
Week 6	AM-SSB & AM-VSB (Modulation-Demodulation)
Week 7	FDM, Frequency Conversion, Super-Heterodyne Receiver
Week 8	Midterm Exam
Week 9	FM: Introduction, NBFM, WBFM
Week 10	Spectrum Plotting Using Bessel Function, Power in FM
Week 11	FM Generation: Direct (VCO) and Indirect Method (Armstrong)
Week 12	FM Detection: Discriminator, Zero Crossing Detector, PLL
Week 13	Introduction, Noise Sources, Mathematical Representation of Noise, Noise Figure
Week 14	Thermal Noise, White & Filtered Noise, Equivalent Temperature, Noise in Multistage System
Week 15	Noise & SNR in: AM and FM.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• Lathi, and Ding. “Modern Digital and Analog Communication Systems”, 2010.	No
Recommended Texts	• Proakis, and Salehi. “Communication Systems Engineering”. 2002.	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**AC Machines I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ELE017**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	UG3		**Semester of Delivery**	5	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name Dr. Omar Kamil Dahham		**e-mail**	E-mail: omar.dahham@uoanbar.edu.iq	
Module Leader's Acad. Title	lectuer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/09/2025		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE004; ELE016	**Semester**	1,4
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This course is designed to enable the students to understand the AC machines. especially induction motors to the standard required at department level. 2. The course integrates Introduction of AC machines construction and operation principle for students of the third year in electrical engineering department. 3. Students, in this course, will deals with single phase induction machine, equivalent circuit, three phase induction machines etc. 4. Theoretical preparation of students to work in the field of electrical machine design, operation, fault detection and control. 5. Applying numerical method to solve industrial problem.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge of AC machines type in general. 2. Deals with single phase induction machine 3. Deals with three phase induction machines etc. 4. Theoretical preparation of students to work in the field of electrical machine design, operation, fault detection and control. 5. Applying numerical method to solve industrial problem
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction of electromagnetic field and design electrical machine. (12 hours) Single phase induction motor. Main and auxiliary windings the doubt revolving field theory. The equivalent circuit-performance calculations. (12 hours) Three phase induction motors-3-phase. AC winding-the rotating electromagnetic field. The equivalent circuit performance. (6 hours) Open circuit and short circuit tests of three phase induction motor, efficiency calculations. Torque speed curve and torque characteristics. (6 hours) Starting of induction machine. Speed control of induction motors. Other modes of operation-starting. (6 hours)

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 the exercises, while improving and expanding their critical thinking skills at the same time. This will be achieved through classes and interactive educational programs and by thinking about the type of simple experiments that include some theoretical and practical activities that include calculating some important values and selection methods for different types of motors and using theoretical information to identify and predict malfunctions that occur to motors in work sites

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
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**	2	10% (10)	5, 10	1,2
	Assignments	2	10% (10)	2, 12	3,4
	Projects / Lab.	1	10% (10)	Continuous	5
	Report	1	10% (10)	13	2,5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	1,5
	Final Exam	2hr	50% (50)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of Electromagnetic Field
Week 2	Design Electrical Machine
Week 3	Single Phase Induction Motor
Week 4	Main and Auxiliary Windings the Doubt Revolving Field Theory
Week 5	The Equivalent Circuit-Performance Calculations.
Week 6	Three Phase Induction Motors-3-Phase
Week 7	Ac Winding-The Rotating Electromagnetic Field
Week 8	The Equivalent Circuit Performance,
Week 9	The Equivalent Circuit Performance,
Week 10	Torque Speed Curve and Torque Characteristics
Week 11	Torque Speed Curve and Torque Characteristics
Week 12	Torque Speed Curve and Torque Characteristics
Week 13	Starting of Induction Machine,
Week 14	Speed Control of Induction Motors
Week 15	Other Modes of Operation-Starting
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction of Electrical Machines.
Week 2	Lab 2: Introduction of Lab. Parts and Equipment
Week 3	Lab 3: Characteristics of The Single-Phase Induction Motor
Week 4	Lab 4: Starting of Single-Phase Induction Motor
Week 5	Lab 5: Laboratory Exam
Week 6	Lab 6: Introduction of Three Phase Induction Motors-3-Phase
Week 7	Lab 7: Connection and Rotational Direction of Three Phase Induction Motor.

Week 8	Lab 8: Torque Speed Curve and Torque Characteristics
Week 9	Lab 9: Efficiency, Current and Power Factor of Three Phase Induction Motor.
Week 10	Lab 10: No load and short circuit test of three phase induction motor
Week 11	Lab 11: mid. Exam
Week 12	Lab 12: Connection & Rotational Direction and Optimum Starting Resistance Test of Three Phase Induction Motor Fitted with Slip Ring Rotor.
Week 13	Lab 13: Characteristics of Three Phase Induction Motor Fitted with Slip Ring Rotor.
Week 14	Lab 14: Laboratory Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	B.L Thiraja, A.K Thiraja, " A text book of electrical technology, volume II	Yes
Recommended Texts	Chapman "Electric Machinery Fundamental", Fourth Edition	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Arabic Language II**			**Module Delivery**	
Module Type	**S**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**UOA002**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		UG3	**Semester of Delivery**		1
Administering Department		Electrical Engineering	**College**	Engineering	
Module Leader	Muanna W Naji		**e-mail**	muanna.naji@uoanbar.edu.iq	
Module Leader's Acad. Title		Assistant Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		02/10/2025	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course aims to build students' knowledge and competence in the Arabic language, rhetoric, and Arabic literature of all kinds, to increase their ability to appreciate literature and develop their awareness of its concepts through the study of poetry, novels, and short stories. story. C- thinking skills: 1. Work on developing the intellectual property of the student. 2. Ensuring the personal development of the student at the academic level.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Develop academic essay writing proficiency 2. Apply reading skills 3. Expand academic vocabulary through reading 4. Improve critical thinking skills 5. Developing the student's intellectual property in the field of the Arabic language, to acquire verbal and actual ability and skill.
Indicative Contents المحتويات الإرشادية	Study of the Holy Qur'an and analysis of its language, spelling, and grammar. [Two hours] Study of a text from the Prophet's Hadith and explain its rules and meanings. [Two hours] Rules for writing hamzas, writing Arabic literally, and numbers and numerical attributes. [Four hours] Punctuation. [Two hours] Dictionaries: A method for identifying words in Arabic dictionaries. [Two hours] Applications of grammar and language, including: the subject and its deputy. [Two hours] Intransitive verbs, the state, and exception. [Two hours] Ancient literary studies, defining literature and its importance, eras of historical Arabic literature - modern literary studies, studying texts of poetic eras (pre-Islamic, Islamic, Umayyad, Abbasid, Andalusian), studying ancient prose texts (sermons, letters), studying modern and contemporary poetry, studying modern prose texts (plays, novels, essays). [Six hours] Study of rhetoric. [Four hours] Language skills, common language mistakes [Four hours]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	e students' lir e importance 33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
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**	5	25% (25)	3,7, 10	LO #4, 6, 8 and 10
	Assignments	2	5% (6)	7	LO # 2
	Projects / Lab.	0			
	Report	1	10% (10)	13	LO # 5, 7 and 13
Summative assessment	**Midterm Exam**	2 hr	10% (10)	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	The Holy Qur'an/ 1. From Surah Al-Isra'/ Verses (23-29). 2. From Surah Yusuf/ Verses (1-7).
Week 2	The Noble Prophetic Hadith / From the Noble Prophetic Hadith: 1. The Messenger of Allah, peace be upon him and his family: "Indeed, Allah loves that when any one of you does a job, he perfects it." 2. "Do not envy one another, do not artificially raise prices, and do not hate one another..." (The full hadith on the morals of the Muslim).
Week 3	Arabic Literature/ 1. Verses from al-Sharif al-Radi's poem lamenting his mother. 2. Abu al-Ala al-Ma'arri's Daliyah:
Week 4	Arabic Literature/ 1. Verses by each of: Al-Jawahiri, Al-Sayyab. 2. Verses from Al-Mu'ammiyya of Al-Mutanabbi:
Week 5	Arabic Grammar/ 1. The Present Tense Verb (Accusative and Jussive). 2. The Genitives.
Week 6	Arabic Grammar: 3. The Accusative Cases. 4. Number and its Rules.
Week 7	Mid-term Exam
Week 8	Provisions for writing the open and tied tāʾ. Provisions for writing the extended and restricted alif.
Week 9	Writing of Ḍād and Ẓā'.
Week 10	Stages of Language Collection. Dictionaries of Words and Meaning. The Method of My School . And Practice in Extracting Words.
Week 11	❖ The Science of Rhetoric and Its Impact on the Eloquence of Speech
Week 12	Moral devices (pun, antithesis, contrast, good reasoning, emphasizing praise with something resembling blame).
Week 13	(Pun, rhyme, quotation, inclusion).
Week 14	Declension of nouns in terms of: masculinity and femininity, simple and augmented forms, singular, dual, and plural.
Week 15	Common linguistic errors. Some linguistic differences
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Lectures in the Arabic language.	Yes
Recommended Texts	❖ Meanings of grammar / Prof. Dr. Fadel Al-Samarrai ❖ Arabic language lessons collection / written by Mustafa Al-Ghailani. ❖ Clarification in the Sciences of Rhetoric / Al-Khatib Al-Qazwini. ❖ Linguistic differences / Abu Hilal Al-Askari.	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Computer Networks III			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE020				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UG3	Semester of Delivery		5
Administering Department		Electrical	College	College of Engineering	
Module Leader	Ahmed Shakir Abdullah		e-mail	Ahmed.s.abd@uoanbar.edu.iq	
Module Leader's Acad. Title		Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		10/oct/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This course deals with the basic concept of data communications. 2. To understand the layered architecture of communication protocols 3. To learn digital signal transmission and encoding techniques. 4. To understand multiplexing techniques. 5. This course deals with concepts and techniques in error detection and correction. 6. To understand LAN architectures and systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Describe the general principles of data communication. 2. Describe how signals are used to transfer data between nodes. 3. Describe how packets in the Internet are delivered. 4. Explain the concept of dividing a job into layered tasks, the functions of the various layers of the OSI Mode. 5. Explain the basics of TCP/IP model, functions of the different layers and protocols involved, addressing mechanisms used under the TCP/IP, IPv4 and importantly IP address and IP header format. 6. Define the transmission medium and its types, understand various network strategies and topologies. 7. Describe how routing protocols work. 8. Design and implement a network protocol. 9. Explain multiplexing techniques. 10. Explain network security and cryptography. 11. Discuss the internet elements and their applications.
Indicative Contents المحتويات الإرشادية	• Network communications, and data networking. • Data transmission: concepts and terminology. transmission media. • Signal encoding techniques, and digital data communications techniques. • Network topologies, network types, computer communications networks. • LAN protocol architecture, topologies and transmission media. • Wireless LAN Technology, IEEE 802.11 architecture and services, physical layer. • OSI reference model and its layers, physical layer. • Data link control protocols. Network layer. • TCP / IP and its layers. • Internetwork protocols. • Circuit switching and packet switching. • Routing in switched networks. • Transport protocols. • Network security and cryptography. • Internet applications: electronic mail and network management, internet directory service and World Wide Web.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
Summative assessment	Midterm Exam	2hr	20% (15)	7	LO # 1-7
	Final Exam	2hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to data communications and networking
Week 2	Data transmission: Data, signals, transmission impairments & their parameters
Week 3	Signal encoding techniques: (digital data, digital signals), (digital data, Analog signals), & (analog data, analog signals).
Week 4	Network topologies, network types, & computer communication networks.
Week 5	Transmission media: Introduction, guided media, applications, optical fiber, unguided media, wireless channels, & satellite microwave.
Week 6	Wireless LANs: Wireless LAN Technology, IEEE 802.11 Architecture and Services, IEEE 802.11 Medium Access Control, & IEEE 802.11 Physical Layer.
Week 7	Introduction, OSI model with its layers and physical layers
Week 8	Midterm Exam
Week 9	Data Link Control & Protocols Data Link Layer: Framing, character-oriented protocols, bit-oriented protocols, flow and error control & protocols.
Week 10	Introduction, TCP/IP model & its layers
Week 11	Switching networks: Circuit switching, packet switching, message switching, virtual circuit, cell switching, & ATM virtual connections.
Week 12	Routing: Introduction, Path determination & routing algorithms
Week 13	Multiplexing: Frequency division multiplexing, synchronous time division multiplexing, statistical time division multiplexing, & digital subscriber line
Week 14	Network security: Introduction, security architecture, security attacks, & achieving network security.
Week 15	Internet applications: electronic mail and network management, internet directory service & World Wide Web.
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• Behrouz A. Forouzan, “data communications and networing’’4th ed., 2007, Mc Graw Hill.	Yes
Recommended Texts	• William Stallings ‘’Data and computer communications’’ 8th edition, 2007, Pearson Education, Inc.	Yes
Websites	1. http://eti2506.elimu.net/Introduction/Books/Data%20Communications%20and%20Networking%20By%20Behrouz%20A.Forouzan.pdf 2. https://memberfiles.freewebs.com/00/88/103568800/documents/Data.And.Computer.Communications.8e.WilliamStallings.pdf	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electric Power I			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE21				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UG3	Semester of Delivery		5
Administering Department		Electrical	College	College of Engineering	
Module Leader	Mushtaq Najeeb Ahmed		e-mail	mushtaq.najeeb@uoanbar.edu.iq	
Module Leader's Acad. Title		Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		1/Oct/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE04	Semester	4
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is designed to introduce elements of power system, generation unit, thermal plants, Hydro plants, Steam plants, nuclear plants. Explain principle of Load factor, capacity factor, transmission line constants, resistance, inductance, single phase two wire, three phase, symmetrical distance, unsymmetrical distance, flat arrangement, horizontal arrangement, hexagonal arrangement. Give an overview of Capacitance, single phase two wire, three phase, symmetrical distance, unsymmetrical distance, flat arrangement, horizontal arrangement, earth effect. Performance design of T.L, short T.L, equivalent circuit, voltage regulation, phasor diagram, Medium T.L, equivalent circuit, voltage regulation, phasor diagram, T model, pi model, Long T.L, equivalent circuit, voltage regulation, phasor diagram.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Energy resources, various types of power stations, 2. Load factor and capacity factor. 3. Constants of transmission line. 4. Symmetrical and unsymmetrical distance. 5. Flat, horizontal, and hexagonal arrangements. 6. Three phase, symmetrical distance, and unsymmetrical distance. 7. Performance of transmission line. 8. Short transmission line. 9. Medium transmission line. 10. Long transmission line.
Indicative Contents المحتويات الإرشادية	1. Explain the basic concept of power generation. 2. Explain the electrical power generations methods. 3. Understand the electrical design of transmission line. 4. Design a transmission line system by applying mathematical methods.

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 type of simple experiments involving some sampling activities that are interesting to the students.

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	4.133
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25%		1,8
	Assignments	1	5 %		2,3
	Activities	1	5 %		4.5
	Report	1	5 %		6,7
Summative assessment	Midterm Exam	1hr	10 %		1,2,4,7
	Final Exam	3hr	50 %		all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	General Background
Week 2	Power Stations (Steam, Hydro-electric, and Diesel)
Week 3	Variable Load on Power Station
Week 4	Variable Load on Power Station
Week 5	Constants of T.L (Resistance and Inductance derivation due to internal and external fluxes)
Week 6	Constants of T.L (Resistance and Inductance derivation due to internal and external fluxes)
Week 7	Inductance of (single-phase, one conductor in a group, and composite conductor)
Week 8	Inductance of (single-phase, one conductor in a group, and composite conductor)
Week 9	Inductance of 3-phase Line Symmetrical and Unsymmetrical Spacing
Week 10	Inductance of (Bundled Conductors and Parallel-circuit 3-phase lines)
Week 11	Capacitance of Transmission Line (single-phase and three-phase with symmetrical spacing)
Week 12	Capacitance of 3-phase with unsymmetrical spacing, bundle conductors, and effect of earth on capacitance
Week 13	Equivalent Circuit of Short Transmission Line
Week 14	Equivalent Circuit of Medium Transmission Line (Nominal T method)
Week 15	Equivalent Circuit of Medium Transmission Line (Nominal pi method)
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	W. Stevenson, element of power system analysis, McGraw- Hill Pub., 2005.	No
Recommended Texts	Principles of power system, V.K Mehta, S. Chand & company ltd., 2004.	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electronic I			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE009				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UG3	Semester of Delivery		5
Administering Department		Electrical	College	College of Engineering	
Module Leader	Omar Khaldoon Adulrahman		e-mail	okabdulrahman@uoanbar.edu.iq	
Module Leader's Acad. Title		Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		30/nov/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE004	Semester	4
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces Multistage and compound Configurations , Log and antilog amplifiers, Amplifier frequency response, Differential amplifier , Application to CMOS and BIMOS circuits , Operational amplifier Characteristics , Op -Amp applications : Constant-Gain Multiplier, Voltage Summing, Voltage Buffer, Controlled Sources, Comparator , Active Filters.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand and analyze the Amplifiers and power amplifier in both the time and frequency domains. 2- Understand the principles of operational amplifier, and application. 3- Understand the Active filter.
Indicative Contents المحتويات الإرشادية	•Amplifier Frequency Response. • Multistage Frequency Effects. • Differential Amplifier Circuits, BIMOS and CMOS Differential Amplifier circuits . • Operational Amplifier (op-amp) Circuits: • Op-Amp Specifications – DC offset parameters and Frequency parameters. • Differential and common – mode operation. • Op-Amp Applications • Controlled Sources, Instrumentation Circuits. •Active Filters

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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	3	10% (10)	5, 10	1
	Assignments	2	5% (5)	2, 12	2
	Projects / Lab.	1	10% (10)		3
	Report	1			1
Summative assessment	Midterm Exam	2hr	15% (15)	8	2
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Amplifier Frequency Response, log , and Antilog
Week 2	Low-Frequency Response—BJT Amplifier.
Week 3	Low-Frequency Response— JFET Amplifier
Week 4	High-Frequency Response—BJT Amplifier
Week 5	High-Frequency Response—JFET Amplifier.
Week 6	Multistage Frequency Effects
Week 7	Differential Amplifier Circuits, BIMOS and CMOS Differential Amplifier circuits .
Week 8	Operational Amplifiers Basics.
Week 9	Operational Amplifier (op-amp) Circuits: Inverting and non-Inverting amplifier, , Summing amplifier, Integrator and Differentiator.
Week 10	Op-Amp Specifications – DC offset parameters and Frequency parameters.
Week 11	Differential and common – mode operation
Week 12	Op-Amp Applications: Multiple – stage gains, Voltage Subtraction, Voltage Buffer.
Week 13	Controlled Sources, Instrumentation Circuits.
Week 14	Voltage Comparator
Week 15	Active Filters: low – pass filter, High – pass filter and Band pass filter.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	CE Amplifier – Setting up the Rest Point (part 1)
Week 2	CE Amplifier – Setting up the Rest Point (part 2)
Week 3	CE Amplifier – R_i measurements
Week 4	CE Amplifier –R_o measurements
Week 5	Frequency response of C.E. Amplifier (part 1)
Week 6	Frequency response of C.E. Amplifier (part 2)
Week 7	Multistage Amplifiers (part 1)
Week 8	Multistage Amplifiers (part 2)
Week 9	Operational Amplifiers. Inverting characteristics
Week 10	Operational Amplifiers. Non-Inverting characteristics
Week 11	Differential amplifiers

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	R. Boylestad and L. Nashelsky, “Electronic Devices and Circuit Theory”, 11th edition , 2013	No
Recommended Texts	Electronic devices : electron flow version / Thomas L. Floyd.— 9th edition.	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Signals and Systems I			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE011				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	3		Semester of Delivery	5	
Administering Department	Electrical		College	College of Engineering	
Module Leader	Adnan Salih Suhail		e-mail	adnansaheluoanbar.edu.iq	
Module Leader's Acad. Title	Dr.		Module Leader's Qualification	Ph.D.	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date	30/oct/2025		Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG009	Semester	4
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of the continuous signals and systems. It studies the linear time-invariant (LTI) systems and their impulse response, convolution. The Fourier transform, and series of continuous signals. The course teaches the frequency response and its applications in the electrical systems and signals communication.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Understand the basic types of analog signals and systems. 2-Understand the causality and stability of continuous LTI systems. 3-Understand and deploy the Fourier transform/series of continuous-time signals and Systems in the electrical engineering.
Indicative Contents المحتويات الإرشادية	• Introduction to C.T system, impulse response, and convolution. • Classification of system. • types of signals, and classification of signals. • Frequency response of LTI system, • system function and transfer function using Laplace Transform. • Block diagram characterization of LTI system. • solution of system differential equation using LT.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	150	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	10
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	238		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	8% (8)	5, 10	1
	Assignments	2	5% (5)	3, 11	2
	Projects	1	5% (5)		3
					2
Summative assessment	Midterm Exam	2hr/2	20% (22)	8, 14	3,2
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to signals and Definition of Signals & Systems
Week 2	Classification of Signals
Week 3	Operations on signals
Week 4	Properties of linear system
Week 5	Analysis of responses, and convolution
Week 6	Representation of Fourier Series
Week 7	Properties of Fourier series, Trigonometric Fourier Series
Week 8	Midterm Exam
Week 9	Fourier Transform, Properties of Fourier Transforms
Week 10	LTI-System Function & Impulse Function
Week 11	block diagram representation of a LTI continuous-time system described by a differential equation.
Week 12	characterize LTI CT systems in the time domain using impulse response and differential equations.
Week 13	use the transfer function of a LTI CT system and the inverse Laplace-transform to obtain the system output.
Week 14	Midterm Exam
Week 15	The Frequency Response of Continuous Time LTI Systems
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	#Oppenheim; Willsky; Hamid; “Signals and Systems” 2nd ed.	No
Recommended Texts	#Hsu; “Schaum’s Outline of Signals and Systems” 3ed.	No
Websites	https://www.tutorialspoint.com/signals_and_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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Digital Communications			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE014				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	UG3		Semester of Delivery	6	
Administering Department	Electrical		College	College of Engineering	
Module Leader	Mohammed Ali Hussein		e-mail	Mohammed.almahamdy@uoanbar.edu.iq	
Module Leader's Acad. Title	Dr.		Module Leader's Qualification	Ph.D.	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date	30/oct/2025		Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE013	Semester	5
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of the digital communication systems. It discusses different techniques of transmitting analog signals in form of discrete/binary signals. Different carrier modulation methods of the binary data are presented.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the principles of sampling and encoding of analog signals. 2. Understand the TDM. 3. Understand the principles of digital modulation.
Indicative Contents المحتويات الإرشادية	• The sampling theory, Nyquist sampling and aliasing in reconstruction. • PCM. • Delta PCM, Deferential PCM, Delta Modulation. • PAM-TDM, PCM-TDM, ISI & Eye Diagram. • M-ary baseband signaling. • Digital modulation: BASK, BFSK, BPSK. • M-ary Modulation, QPSK, QAM.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	202		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	1
	Assignments	2	5% (5)	2, 12	2
	Projects / Lab.	1	10% (10)		3
	Report	1			2
Summative assessment	Midterm Exam	2hr	15% (15)	8	1,2
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	The Sampling Theory, Nyquist Sampling Rate & Aliasing in Reconstruction
Week 2	PCM
Week 3	Examples & Problems
Week 4	Non-Uniform Quantization, SNR in PCM
Week 5	Delta PCM, Deferential PCM, DM Systems, Noise in DM, Adaptive DM
Week 6	PAM-TDM, Crosstalk and Guard Times, PCM-TDM, ISI & Eye Diagram
Week 7	Channel Capacity, Multi-Level Baseband Signaling (M-ary)
Week 8	Midterm Exam
Week 9	Probability of Error at Reception
Week 10	Examples & Problems
Week 11	Introduction Digital Modulation, BASK
Week 12	BFSK
Week 13	BPSK
Week 14	M-ary Modulation, QPSK
Week 15	QAM
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	LAB1: RF oscillators
Week 2	LAB2: 2nd order filter
Week 3	LAB3: AM-DSB-LC Modulation
Week 4	LAB4: Frequency Modulation
Week 5	LAB5: PCM
Week 6	LAB6: PWM
Week 7	LAB7: ASK
Week 8	LAB8: FSK

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• Lathi, and Ding. “Modern Digital and Analog Communication Systems”, 2010.	No
Recommended Texts	• Proakis, and Salehi. “Communication Systems Engineering”. 2002.	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**AC Machines II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ELE018**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		UG3	**Semester of Delivery**		6
Administering Department		Electrical	**College**	College of Engineering	
Module Leader	Name Dr. Mustafa Lateef Hasan		**e-mail**	E-mail: mustafa.lateef@uoanbar.edu.iq	
Module Leader's Acad. Title		lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/11/2025	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE017	**Semester**	5
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This course is designed to enable the students to understanding synchronous machines and transformers to the standard required at department level. 2. The course integrates Introduction of SG and SM definition of all types, operation and control of Synchronous machines and transformer for students of the third year in electrical engineering department. Students, in this course, will deals with operation principle of synchronous generator, equivalent circuit of SG and efficiency calculation. 3. Study motor operation mode and its equivalent circuit. Efficiency calculation of SM, starting and stopping of SM. 4. introduction of transformers and its several types. Power transformer and distribution transformer.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge of synchronous machines type in general. 2. Deals with synchronous generators and its control. 3. Deals with parallel operation of SG. 4. Deals with synchronous motors and its control and applications. 5. Deals with single phase and three phase transformer and its operation and application in industry life. 6. Theoretical preparation of students to work in the field of electrical machine design, operation, fault detection and control. 7. Applying numerical method to solve industrial problem
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction of Three phase synchronous machines. Basic theory of operation of synchronous generator. (6 hours) Voltage & torque equations for cylindrical rotor of SG. Voltage and - torque equations for salient pole of SG. Parallel operation of SG. (12 hours) Basic theory of operation of synchronous motor. Efficiency and losses of SG. (6 hours) Voltage & torque equations of SM. Efficiency and losses of SM. Starting and stopping of SM. (12 hours) Transformer principle: Single phase transformer, Transformer-types of transformer, construction, phasor diagram, no-load and short circuit tests. (6 hours) losses in transformers, the equivalent circuit of the transformer, efficiency, regulation, auto-transformer. (6 hours) Three phase transformers. Efficiency and maximum efficiency condition of transformer. Parallel operation of transformer. (6 hours)

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 the exercises, while improving and expanding their critical thinking skills at the same time. This will be achieved through classes and interactive educational programs and by thinking about the type of simple experiments that include some theoretical and practical activities that include calculating some important values and selection methods for different types of synchronous motors, generators and transformers. and using theoretical information to identify and predict malfunctions that occur to motors in work sites

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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**	2	10% (10)	5, 10	LO #1, 2, and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of Three phase synchronous machines
Week 2	basic theory of operation of synchronous generator
Week 3	voltage & torque equations for cylindrical rotor of SG
Week 4	voltage and -torque equations for salient pole of SG
Week 5	Parallel operation of SG
Week 6	basic theory of operation of synchronous motor
Week 7	Efficiency and losses of SG
Week 8	voltage & torque equations of SM
Week 9	Efficiency and losses of SM
Week 10	Starting and stopping of SM
Week 11	Transformer principle
Week 12	Three phase transformers
Week 13	Efficiency and maximum efficiency condition of transformer
Week 14	Parallel operation of transformer
Week 15	Parallel operation of transformer
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1Introduction of Synchronous Machines.
Week 2	Lab 2: Connection and Rotational Direction Test of Synchronous Generator.
Week 3	Lab 3: No load characteristics of synchronous generator
Week 4	Lab 4: Load characteristics of synchronous generator
Week 5	Lab 5: Mains synchronization and control characteristics of the synchronous generator
Week 6	Lab 6: connection and rotational direction test and load characteristics of synchronous motor.
Week 7	Lab 7: V- curve of the syn. Motor

Week 8	Lab 8 : Open circuit & short circuit tests of single phase transformer.
Week 9	Lab 9: Regulation and efficiency of three phase transformer by direct load.
Week 10	L ab 10: Polarity making and conversion of two winding transformer into auto transformer
Week 11	Lab 11: Back to back test on single phase transformer.
Week 12	Lab 12: SCOTT connection of transformer
Week 13	Laboratory Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	B.L Thiraja, A.K Thiraja, " A text book of electrical technology, volume II	Yes
Recommended Texts	Chapman "Electric Machinery Fundamental", Fourth Edition	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electric Power II			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE022				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UG3	Semester of Delivery		6
Administering Department		Electrical	College	College of Engineering	
Module Leader	Mushtaq Najeeb Ahmed		e-mail	mushtaq.najeeb@uoanbar.edu.iq	
Module Leader's Acad. Title		Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		1/Feb/2026	Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE021	Semester	5
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is designed to introduce the 2-port network, ABCD constants, power circle diagram, power flow through T.L. Give an overview of Overhead T.L insulators, string insulators, voltage distribution, and corona. Explain Sag and stress calculations, parabola equation, effect of ice and wind, different level supports, economic operation, and underground cables.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Parameters of 2-port networks 2. Load ability and power flow through T.L. 3. Mechanical design of O.H.T.L. insulators. 4. Voltage distribution on string insulator. 5. Sag calculations through same and different supports. 6. Corona phenomena study. 7. Parameters of underground cables. 8. Economic dispatch of power system.
Indicative Contents المحتويات الإرشادية	• To understand the 2-port networks parameters. • To explain the load ability and power flow through T.L. • To understand O.H.T.L insulators. • To understand the basic concept of sag calculation • To understand underground cables. • To know the principle of economic dispatch of power system.

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 type of simple experiments involving some sampling activities that are interesting to the students.

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	4.133
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25%		1,2,3
	Assignments	1	5 %		4,5,6
	Activities	1	5 %		7,8
	Report	1	5 %		1,2,5,8
Summative assessment	Midterm Exam	1hr	10 %		8,7,3,4,5
	Final Exam	3hr	50 %		all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	2-Port Networks and Determination Short T.L. Parameters
Week 2	ABCD Method for Medium Transmission Lines
Week 3	ABCD method for long transmission lines and 2-Cascaded T.L
Week 4	Power Flow through T.L., Sending and Receiving Circle Diagrams
Week 5	Power Flow through T.L., Sending and Receiving Circle Diagrams
Week 6	Overhead T.L Components, Conductor Materials, and Line Supports
Week 7	Overhead T.L Components, Conductor Materials, and Line Supports
Week 8	Potential Distribution over Suspension Insulator String
Week 9	Potential Distribution over Suspension Insulator String
Week 10	Corona and Sag in Overhead Transmission Lines
Week 11	Corona and Sag in Overhead Transmission Lines
Week 12	Underground Cables
Week 13	Underground Cables
Week 14	Economic Operation of Power Generation (without line losses)
Week 15	Economic Operation of Power Generation (with line losses)
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	W. Stevenson, element of power system analysis, McGraw- Hill Pub., 2005.	No
Recommended Texts	Principles of power system, V.K Mehta, S. Chand & company ltd., 2004.	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electronic II			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE010				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UG3	Semester of Delivery		6
Administering Department		Electrical	College	College of Engineering	
Module Leader	Omar Khaldoon Adulrahman		e-mail	okabdulrahman@uoanbar.edu.iq	
Module Leader's Acad. Title		Dr.	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		30/nov/2025	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE009	Semester	4
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the Power Amplifiers: Definitions and Amplifier Types . Feedback Circuits: Feedback Concepts, Feedback Connection Types .Linear Oscillators : Basic Principles of Sinusoidal Oscillators , Positive Feedback and Oscillation, The oscillation Criterion . RC Oscillator: RC Phase-Shift Oscillator and Wien-Bridge oscillator. LC and Crystal Oscillator . Non-Sinusoidal Oscillators and Tim Circuits. Schmitt Trigger Oscillator, The 555 Circuit and applications (Monostable ultivibrator, Astable Multivibrator). Power Supplies (Voltage Regulators) and Practical Applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the Amplifiers types, and analyze the feedback circuit and feedback conniction 2-Understand the principles of Oscillation, and its circuits and application. 3- Understand the Power supplies and voltage regulation.
Indicative Contents المحتويات الإرشادية	• Power Amplifiers: Definitions, Amplifier Classes and Efficiency •Feedback Circuits: Feedback Concepts. Feedback Connection Types. • Practical Feedback Circuits: Voltage –shunt, Voltage- series configuration. • Practical Feedback Circuits: Current –shunt, Current - series configuration. • Linear Oscillators: Basic Principles of Sinusoidal Oscillators, • Power Supplies (Voltage Regulators) and Practical Applications.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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	3	10% (10)	5, 10	1
	Assignments	2	5% (5)	2, 12	2
	Projects / Lab.	1	10% (10)		3
	Report	1			1
Summative assessment	Midterm Exam	2hr	15% (15)	8	2
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	• Power Amplifiers: Definitions, Amplifier Classes and Efficiency
Week 2	• Class A amplifiers.
Week 3	• Class B amplifiers and Class- (AB), Class- (C)
Week 4	•Feedback Circuits: Feedback Concepts. Feedback Connection Types.
Week 5	• Practical Feedback Circuits: Voltage –shunt, Voltage- series configuration.
Week 6	• Practical Feedback Circuits: Current –shunt, Current - series configuration.
Week 7	• Linear Oscillators: Basic Principles of Sinusoidal Oscillators, Positive Feedback and Oscillation,
Week 8	• RC Phase-Shift Oscillator and Wien Bridge Oscillator
Week 9	• LC Oscillator, Crystal Oscillator,
Week 10	• Non-Sinusoidal Oscillators and Timer Circuits Schmitt Trigger Oscillator.
Week 11	• The 555 Circuit and applications (Monostable Multivibrator)
Week 12	• Astable Multivibrator
Week 13	• Power Supplies (Voltage Regulators) and Practical Applications.
Week 14	• Discrete Transistor Voltage Regulation
Week 15	• IC Voltage Regulators.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	Differential amplifiers
Week 2	Active filter.
Week 3	The triangle- square wave generator.
Week 4	Applying Negative Feedback on Amplifiers part
Week 5	RC Phase – shift Oscillators(part 1)
Week 6	RC Phase – shift Oscillators(part 2)
Week 7	LC Oscillator(part 1)
Week 8	LC Oscillator(part 2)
Week 9	Voltage Regulator
Week 10	Current Regulator
Week 11	Laboratory Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	R. Boylestad and L. Nashelsky, “Electronic Devices and Circuit Theory”, 11th edition , 2013	No
Recommended Texts	Electronic devices : electron flow version / Thomas L. Floyd.— 9th edition.	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Programming**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ELE019**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	UG3		**Semester of Delivery**	6	
Administering Department	Electrical		College	College of Engineering	
Module Leader	Dr. Mohammad Khaleel Awsaj		**e-mail**	Mohammed.awsaj@uoanbar.edu.iq	
Module Leader's Acad. Title	Ass. Professor Dr.		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	01/11/2025		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course provides introduction to MATLAB. Programming in MATLAB includes input and output of data, algebraic and logical expressions, all data types including complex numbers and strings, array indexing and array operations, matrices and matrix operations, control structures, graphics and plots. Applications of MATLAB to solutions of engineering problems include solutions of systems of linear equations. Introduction to Simulink.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Become familiar with fundamental operations in Matlab. 2. Use matrix forms to describe and solve linear systems of equations. 3. Programming with MATLAB to solve mathematical and engineering problems. 4. Use MATLAB to generate graphics. 5. Use the Simulink simulation package to simulate some electric circuits.
Indicative Contents المحتويات الإرشادية	• General introduction to MATLAB. • Numeric, Cell, and Structure Arrays. • Matrix and Array Operations. • Matrix Methods for solving linear equations. • Script Files and Functions. • Programming in MATLAB. • Control flow and operators. • Plotting, creating multiple plot types and three-dimensional plots. • Introduction to Simulink and its instruments.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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**	2	10% (10)	5, 10	1,2,3
	Assignments	2	10% (10)	2, 12	4,1,2
	Projects / Lab.	1	10% (10)	Continuous	1.3
	Report	1	10% (10)	13	1.3
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	1,4,5
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General introduction to MATLAB.
Week 2	Numeric, Cell, and Structure Arrays.
Week 3	Matrix and Array Operations.
Week 4	Matrix Methods for solving linear equations.
Week 5	Script Files and Functions.
Week 6	Programming in MATLAB.

Week 7	Programming Exercises
Week 8	Programming Exercises
Week 9	**Mid – term Exam**
Week 10	Control flow and operators.
Week 11	Control flow and operators.
Week 12	Plotting, creating multiple plot types and three dimensional plots.
Week 13	Plotting, creating multiple plot types and three dimensional plots.
Week 14	Introduction to Simulink and its instruments.
Week 15	Introduction to Simulink and its instruments.
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to MATLAB program.
Week 2	Lab 2: Matrix and Array arithmetic operations in MATLAB
Week 3	Lab 3: Solving Linear Equations in MATLAB
Week 4	Lab 4: Programming in MATLAB
Week 5	Lab 5: Control Flow and Operators in MATLAB
Week 6	Lab 6: Plotting in MATLAB
Week 7	Lab 7: Introduction to Simulink in MATLAB

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Introduction to MATLAB for Engineers by William J. Palm III, McGraw-Hill, 3rd Edition, 2011.	No
Recommended Texts	Introduction To MATLAB For Engineering Students by David Houcque, Northwestern University, (version 1.2, August 2005)	No
Websites		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Signals and Systems II			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ELE012				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	3		Semester of Delivery	6	
Administering Department	Electrical		College	College of Engineering	
Module Leader	Adnan Salih Suhail		e-mail	adnansaheluoanbar.edu.iq	
Module Leader's Acad. Title	Dr.		Module Leader's Qualification	Ph.D.	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date	30/0ct/2025		Version Number	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE011	Semester	5
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of the discrete-signals and systems. It studies the linear time-invariant (LTI) systems and their impulse response, convolution. The Discrete-Fourier transform, and series of Discrete-Time signals. The course teaches the frequency response and its applications in the electrical systems and signals communication.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Understand the basic types of discrete signals and systems. 2-Understand the causality and stability of D-T LTI systems. 3-Understand and deploy the Fourier transform/series of Discrete-time signals and Systems in the electrical engineering.
Indicative Contents المحتويات الإرشادية	• Introduction to D.T system, impulse response, and convolution. • Classification of D-T LTI system. • types of D-Tsignals, and classification of signals. • Frequency response of D-T LTI system, • system function and transfer function using Z-Transform. • Block diagram characterization of LTI system. • solution of system difference equation using Z-Transform.

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	150	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	10
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	238		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	8% (8)	5, 10	2
	Assignments	2	5% (5)	3, 11	1
	Projects	1	5% (5)		3
					2
Summative assessment	Midterm Exam	2hr/2	20% (22)	8, 14	1
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to Discrete-Time (D-T) signals and Definition of Signals & Systems
Week 2	Classification of D-TSignals
Week 3	Operations on D-T signals
Week 4	Properties of D-T LTI system
Week 5	Analysis of responses, and convolution
Week 6	Representation of Discrete Fourier Series
Week 7	Properties of D-T Fourier series, Complex Fourier Series
Week 8	Midterm Exam
Week 9	Discrete-Time Fourier Transform, Properties of Fourier Transforms
Week 10	LTI-System Function & Impulse Function
Week 11	block diagram representation of a LTI Disctere-time system described by a difference equation.
Week 12	characterize LTI D-T systems in the time domain using impulse response and difference equations.
Week 13	Z-Transform, properties of Z-T, invers Z-T, Z-T of basic D-T signals.
Week 14	Midterm Exam
Week 15	use the transfer function of a LTI D-T system and the inverse Z-transform to obtain the system output
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	#Oppenheim; Willsky; Hamid; “Signals and Systems” 2nd ed.	No
Recommended Texts	#Hsu; “Schaum’s Outline of Signals and Systems” 3ed.	No
Websites	https://www.tutorialspoint.com/signals_and_systems	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
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	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.

Course Description Form

Review the performance of higher education institutions ((review of the academic program))

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve. Prove whether he has made the most of the available learning opportunities. It must be linked to the description of program.

1. Educational institution	University of Anbar / College of Engineering
2. University Department / Center	Electrical Engineering Department
3. Course Name/Code	Control Theory I/ EE4332
4. Programs in which he enters	
5. Available Attendance Forms	E- presence
6. Semester / Year	First Semester 2025-2026
7. Number of Credit Hours (Total)	90
8. The preparation date of this description	1/9/2025
9- Course Objectives :	
A. The correct understanding of the working methods of control systems.	
B. Theoretical andsimile study on computers of control theories.	
C. Design for conventional controllers for all control systems	

10. Learning outcomes and teaching, learning and assessment methods

To familiarize the student with the history of control science and the most important scientists who made shifts in this science
The student should familiarize himself with the basic units of controlling dealing
The student should know the general structure of the control problem
The student should be introduced to the methods of dealing with traditional control problems
The student should know the goals of control in reducing cost with the largest exit and the fastest response

B - Subject-specific skills
B1 – Scientific Reports
B2 – Graduation Research

Teaching and learning methods

- Continuous sudden and weekly daily tests.
- Exercises and activities in the classroom.
- Guiding students to some sources that contain examples and exercises to benefit from them.

Evaluation methods

Participation in the classroom.
Submission of activities
Quarterly tests, activities and activities.

C- Thinking skills
C1 - Developing the student's ability to work on performing duties and delivering them on time.
C2- Try to apply concepts by solving different types of exercises.
C3- Developing the student’s ability to dialogue and discussion.

Teaching and learning methods
• Exercises and sports problems • Assigning the student some group activities and duties. • Allocate a percentage of the grade for daily assignments and tests.
Evaluation methods
• Active participation in the classroom is a guide to student commitment and responsibility. • Commitment to the deadline in submitting assignments and research. • Quarterly and final exams express commitment and achievement of knowledge and skills. • Apps, exercises and daily assignments
D - General and transferred skills (other skills related to employability and personal development). D1- Developing the student's ability to deal with the means of technology. D2- Developing the student's ability to deal with the Internet. D3- Developing the student's ability to deal with multiple means. D4- Developing the student's ability to dialogue and discussion.

11. Course Structure					
The week	**Hours**	**Required Learning Outcomes**	**Name of the unit/course or topic**	**Method of education**	**Evaluation method**
First	3	Introduction to control system:		Theoretical + Discussion	General questions and discussion
Second	3	Mathematical Representation of physical systems:		Theoretical + Discussion	General questions and discussion or exam I
Third	3	transfer functions		Theoretical + Discussion	General questions and discussion
Fourth	3	electrical systems; mechanical translation system		Theoretical + Discussion	I'm examined.
Fifth	3	Thermal systems; Liquid Systems; Component Systems		Theoretical + Discussion	General questions and discussion or exam I
Sixth	3	Steady Space representation of physical systems		Theoretical + Discussion	General questions and discussion
Seventh	3	Interchange between Transfer function and Steady Space		Theoretical + Discussion	General Questions
Eighth	3	Block diagrams Processing		Theoretical + Discussion	Group duties
Ninth	3	Signal flow graphs:		Theoretical + Discussion	General Questions
Tenth	3	Transient response analysis:		Theoretical + Discussion	Monthly exam
Eleventh	3	Transient response analysis:		Theoretical + Discussion	General Questions
Twelfth	3	Steady – state error in unity- feedback control system		Theoretical + Discussion	Discussion and exam I
Thirteenth	3	Steady – state error in unity- feedback		Theoretical +	General Questions

		control system:		Discussion	
Fourteenth	3	Routh's stability criterion.		Theoretical + Discussion	Group Duties+ discussion
Fifteenth	3	Routh's stability criterion.		Theoretical + Discussion	Monthly exam

12. Infrastructure	
Required readings: ▪ Course Books ▪ Other	Modern control Engineering Katsuhiko Oqata1 Linear Control System Analysis and Design with MATLAB/ John J. D'Azzo and Constantine 2 – Automatic Control Systems / BENJAMIN C. KUO.
Special requirements	
Social services (e.g. guest lectures, vocational training and field studies)	Practical application in graduation research projects.

13. Acceptance	
Prerequisites	***EE2209, EE2311, EE3320 and EE3325***
Minimum number of students	10
The largest number of students	40

Course Description Form

Review the performance of higher education institutions ((review of the academic program))

Course Description

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve. Prove whether he has made the most of the available learning opportunities. It must be linked to the description of program.

1. Educational institution	University of Anbar / College of Engineering
2. University Department / Center	Electrical Engineering Department
3. Course Name/Code	Control Theory II/ EE4333
4. Programs in which he enters	
5. Available Attendance Forms	E- presence
6. Semester / Year	Second Semester 2025-2026
7. Number of Credit Hours (Total)	90
8. The preparation date of this description	1/9/2025
9. Course Objectives:	
A. The correct understanding of the working methods of control systems.	
B. Theoretical and simulation study on computers of control theories.	
C. Design for conventional controllers for all control systems	

9. Learning outcomes and teaching, learning and assessment methods

To familiarize the student with the history of the science of control and the most important scientists who made shifts in this science
The student should be familiar with the basic units of the dominant transaction
The student should recognize the general structure of the control problem
The student should be introduced to the methods of dealing with traditional control problems
The student should know the goals of control in reducing the cost with the largest exit and the fastest response

B - Subject-specific skills
B1 – Scientific Reports
B2 – Graduation Research

Teaching and learning methods

- Continuous sudden and weekly daily tests.
- Exercises and activities in the classroom.
- Guiding students to some sources that contain examples and exercises to benefit from them.

Evaluation methods

Participation in the classroom.
Submission of activities
Quarterly tests, activities and activities.

C- Thinking skills
C1- Developing the student's ability to work on performing duties and delivering them on time.
C2- Try to apply concepts by solving different types of exercises.
C3- Developing the student's ability to dialogue and discuss.

Teaching and learning methods
• Exercises and sports problems • Assigning the core to some collective activities and duties. • Allocate a percentage of the grade for daily assignments and tests.
Evaluation methods
• Active participation in the classroom Evidence of student commitment and responsibility. • Commitment to the deadline in submitting assignments and research. • Quarterly and final exams express commitment and achievement of knowledge and skills. • Apps, exercises and daily assignments
d. General and transferable skills (other skills related to employability and personal development). D1- Developing the student's ability to deal with technical means. D2- Developing the student's ability to deal with the Internet. D3- Developing the student's ability to deal with multiple means. D4- Developing the student's ability to dialogue and discuss.

10. Course Structure					
The week	**Hours**	**Required Learning Outcomes**	**Name of the unit/course or topic**	**Method of education**	**Evaluation method**
First	3	***Root Locus:***		Theoretical + Discussion	General questions and discussion
Second	3	***Control system design by the root locus method***		Theoretical + Discussion	General questions and discussion or exam I
Third	3	***Bode diagram***		Theoretical + Discussion	General questions and discussion
Fourth	3	***Polar plots.***		Theoretical + Discussion	I'm examined.
Fifth	3	***Nyquist stability criterion.***		Theoretical + Discussion	General questions and discussion or exam I
Sixth	3	***Nyquist stability criterion.***		Theoretical + Discussion	General questions and discussion
Seventh	3	***Three term controllers : First Order system***		Theoretical + Discussion	General Questions
Eighth	3	***Three term controllers* : Second order System**		Theoretical + Discussion	Group duties
Ninth	3	Modified PID Controller		Theoretical + Discussion	General Questions
Tenth	3	Modified PID Controller		Theoretical + Discussion	Monthly exam
Eleventh	3	***Sampled data system.***		Theoretical + Discussion	General Questions
Twelfth	3	***Sampled data system.***		Theoretical + Discussion	Discussion and exam I
Thirteenth	3	***Analysis of control systems in state space:***		Theoretical + Discussion	General Questions
Fourteenth	3	***Analysis of control***		Theoretical +	Group Duties+

		systems in state space:		Discussion	discussion
Fifteenth	3	**Controllability and Observability**		Theoretical + Discussion	Monthly exam

11. Infrastructure	
Required readings: ▪ Course Books ▪ Other	Modern control Engineering Katsuhiko Oqata1 Linear Control System Analysis and Design with MATLAB/ John J. D'Azzo and Constantine 2 – Automatic Control Systems / BENJAMIN C. KUO.
Special requirements	
Social services (e.g. guest lectures, vocational training and field studies)	Practical application in graduation research projects.

12. Acceptance	
Prerequisites	***EE4332***
Minimum number of students	10
The largest number of students	40

Course Description Form

1. Course Name: control lab
2. Course Code: ***EE4331***
3. Semester / Year: second semester/ 2025-2025
4. Description Preparation Date: 24-9-2025
5. Available Attendance Forms: attendance
6. Number of Credit Hours (Total) 45 Number of Units (Total): 1
7. Course administrator's name (mention all, if more than one name)
Name: lecturer –yasameen kamil najm Email: yknajm@uoanbar.edu.iq

8. Course Objectives

Course Objectives	**This course aims to:** **1- Laboratory application to study the foundations analog control** **2- Laboratory application to study the foundations how to deal with control systems** **3- The semester provides an experimental basis understanding the control of feedback systems** **4- The semester provides an experimental basis for mathematical representation of many phys systems**…..

9. Teaching and Learning Strategies

Strategy	1. Understand the main principles of control systems operation

Course Description Form

	2. Study mathematical models of control systems 3. Theoretical study and implementation of applications in the laboratory 4. Design some control systems and apply them practically 5. Practical application of the most important control systems in th laboratory 6. Link the theoretical study of some applications to the practical si

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Compensator	Lec 1	Practical	Report+ quize
2	3	Phase lag compensator Part 1	Exp-9-part1	practical	Report
3	3	Phase lag compensator Part 2	Exp-9-part2	practical	Report
4	3	Phase lead compensator Part1	Exp 10- part 1		
5	3	Phase lead compensator Part12	Exp 10- part 2	practical	Report
6	3	Phase lead -lag compensator	Exp 11	practical	Report
7	3	Examination	Examination	examination	examination
8	3	Integral controller	Exp-12	practical	report
9	3	Derivative controller	Exp-13	practical	report
10	3	Proportional + integral controller part 1	Exp-14-part1	practical	report
11	3	Proportional + integral controller part 2	Exp-14-part2	practical	report
12	3	Proportional +Derivative controller	Exp-15	practical	report
13	3	examination	Examination	practical+ theoretical	practical+ theoreti
14	3	Proportional + integral + derivative controller	Exp-16	practical	report

Course Description Form

15	3	final examination	examination	practical+ theoretical	practical+ theoreti

11. Course Evaluation

Active participation during the lecture is evidence of the student's commitment and responsibility.
- Commitment to the deadline for submitting assignments and daily reports.
- Midterm and final exams express commitment and knowledge and skill attainment.
- Applications, exercises and daily assignments

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Laboratory sheet prepared by department lecturers
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name: control lab
2. Course Code: ***EE4330***
3. Semester / Year: first semester/ 2025-2026
4. Description Preparation Date: 24-9-2025
5. Available Attendance Forms: attendance
6. Number of Credit Hours (Total) 45 Number of Units (Total): 1
7. Course administrator's name (mention all, if more than one name)
Name: lecturer –yasameen kamil najm Email: yknajm@uoanbar.edu.iq

8. Course Objectives

Course Objectives	**This course aims to:** **1- Laboratory application to study the foundations analog control** **2- Laboratory application to study the foundations how to deal with control systems** **3- The semester provides an experimental basis understanding the control of feedback systems** **4- The semester provides an experimental basis for mathematical representation of many phys systems**…..

9. Teaching and Learning Strategies

Strategy	1. Understand the main principles of control systems operation

Course Description Form

	2. Study mathematical models of control systems 3. Theoretical study and implementation of applications in the laboratory 4. Design some control systems and apply them practically 5. Practical application of the most important control systems in th laboratory 6. Link the theoretical study of some applications to the practical si

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Definition for control system and the part the system models -1000- ACS	Lec 1	Practical	Report+ quize
2	3	Laplace transformer Part 1	Exp-1-part1	practical	Report
3	3	Laplace transformer Part	Exp-1-part2	practical	Report
4	3	Introduction to MAT-LAB- Simulink -pa	Lec2	practical	Report
5	3	Introduction to MAT-LAB- Simulink -pa	Lec3	practical	Report
6	3	First order system	Exp-2-part1	practical	report
7	3	Examination	Examination	examination	examination
8	3	Second order system	Exp-3	practical	report
9	3	transient Response Specifications	Exp-4	practical	report
10	3	Steady State Error Part1	Exp-5-part1	practical	report
11	3	Steady State Error Part1	Exp-5-part1	practical	report
12	3	System simulation	Exp-6	practical	report
13	3	dominant pole of second order system	Exp-7	practical	

Course Description Form

14 15	3 3	proportional control final examination	Exp-8 examination	practical practical	report

11. Course Evaluation

Active participation during the lecture is evidence of the student's commitment and responsibility.
- Commitment to the deadline for submitting assignments and daily reports.
- Midterm and final exams express commitment and knowledge and skill attainment.
- Applications, exercises and daily assignments

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Laboratory sheet prepared by department lecturers
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

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

University of Anbar
College of Engineering
Department of Electrical Engineering

Course Description Form

1. Course Name: Advanced Communication
2. Course Code: **EE4335**
3. Semester / Year: Second / Fourth Academic Year (2025 -2026)
4. Description Preparation Date: 28-12-2025
5. Available Attendance Forms: Traditional class/ Blended
6. Number of Credit Hours (Total) : 45 Number of Units (Total): 45
7. Course administrator's name (mention all, if more than one name)
Name: Assist Prof. Dr. Naser Al-Falahy Email: naser.falahy@uoanbar.edu.iq
8. Course Objectives

Course Objectives	• **Understand the spread spectrum system** • **Study satellite communication system** • **Study Radar** • **Design a link through understanding link budget**
9. Teaching and Learning Strategies	
Strategy	• **Sudden daily and weekly continuous tests.** • **Exercises and activities in the classroom.** • **Guiding students to some sources that contain examples and exercises to benefit from them.**

Course Description Form

10.
11. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Direct Seque Spread Spectrum	-	Theoretical Discussion	General questions discussion
2	3	Frequency Hopp Spread Spectrum	-	Theoretical Discussion	General written oral questi and discussi
3	3	Tutorials Of Sp Spectrum	-	Theoretical Discussion	discussion
4	3	Pseudo Rand Number Generation	-	Theoretical Discussion	Exam I general questions discussion
5	3	Spectrum Spread Scenario	-	Theoretical Discussion	General questions discussion exam I
6	3	Advantages, Jamming/Noise Immunity Of Pse Noise	-	Theoretical Discussion	General questions discussion

Course Description Form

7	3	Tutorials Of Pseudo Noise	-	Theoretical Discussion	Monthly exa
8	3	Introduction Of Satel Communications	-	Theoretical Discussion	Discussion with to g collective duties
9	3	Satellite Applications	-	Theoretical Discussion	General Questions
10	3	Uplink/Downlink Propagati	-	Theoretical Discussion	General questions discussion
11	3	Orbits Of Satellites	-	Theoretical Discussion	General Questions
12	3	Path Loss and Link budget	-	Theoretical Discussion	General questions discussion
13	3	Introduction To RAD Systems	-	Theoretical Discussion	General Questions

Course Description Form

14	3	Transmitter & Rece Architecture	-	Theoretical Discussion	Monthly ex
15	3	Fundamental Of GPS Sys (Space, Control, U Segment	-	Theoretical Discussion	General questions discussion

12. Course Evaluation

- Daily exams (10)
- Submission of assignments (5)
- Participation inside the hall (5)
- monthly exams (20)
- Final Exam (60)

13. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	• **Communication-Systems 4ed by Haykin** • **Satellite Communications- 4th Edition by *Dennis Roddy***
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name: Information Theory
2. Course Code: **EE4334**
3. Semester / Year: First / Fourth Academic Year (2025 -2026)
4. Description Preparation Date: 28-12-2025
5. Available Attendance Forms: Traditional class/ Blended
6. Number of Credit Hours (Total) : 45 Number of Units (Total): 45
7. Course administrator's name (mention all, if more than one name)
Name: Assist Prof. Dr. Naser Al-Falahy Email: naser.falahy@uoanbar.edu.iq
8. Course Objectives

Course Objectives	• **Understand the digital communication system** • **Theoretical and simulation of Information theory** • **Design algorithm for source and channel** • **Data protection with channel coding**
9. Teaching and Learning Strategies	
Strategy	• **Sudden daily and weekly continuous tests.** • **Exercises and activities in the classroom.** • **Guiding students to some sources that contain examples and exercises to benefit from them.**

Course Description Form

10.

11. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Model communication system, Eleme of a dig communication system	-	Theoretical Discussion	General questions discussion
2	3	Measure Information, Information content of message, Avera information content [Entropy	-	Theoretical Discussion	General written oral questi and discussi
3	3	Entropy information rate Markov sour Encoding of source output.	-	Theoretical Discussion	discussion
4	3	Shannon's Encoding Algorithm	-	Theoretical Discussion	Exam I general questions discussion
5	3	Fano Encod Algorithm	-	Theoretical Discussion	General questions discussion exam I

Course Description Form

6	3	Huffman Encod Algorithm	-	Theoretical Discussion	General questions discussion
7	3	LZ Algorithm	-	Theoretical Discussion	Monthly exa
8	3	Channels, capacity discrete memoryl channel	-	Theoretical Discussion	Discussion with to g collective duties
9	3	Channel analysis	-	Theoretical Discussion	General Questions
10	3	Examples	-	Theoretical Discussion	General questions discussion
11	3	Error detection correction	-	Theoretical Discussion	General Questions
12	3	linear block codes (er correction & detection)	-	Theoretical Discussion	General questions discussion

Course Description Form

13	3	binary cyclic co (syndrome calculat error detection & er correction)	-	Theoretical Discussion	General Questions
14	3	Examples	-	Theoretical Discussion	Monthly exa
15	3	convolutional co (encoding, decoding a performance), the vite algorithm (optim decoding),	-	Theoretical Discussion	General questions discussion

12. Course Evaluation

- Daily exams (10)
- Submission of assignments (5)
- Participation inside the hall (5)
- monthly exams (20)
- Final Exam (60)

13. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	● S. Haykin; "Communication Systems", 4th ed. ● Glavieux, "Channel Coding in Communication Networks", ISTE, 2007.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name: Optical Communication System
2. Course Code: ELE024
3. Semester / Year: Second / Fourth Academic Year (2025 -2026)
4. Description Preparation Date: 28-10-2025
5. Available Attendance Forms: Traditional class/ Blended
6. Number of Credit Hours (Total) : 45 Number of Units (Total): 45
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Mohammad Khaleel Awsaj Email: Mohammed.awsaj@uoanbar.edu.iq
8. Course Objectives

Course Objectives	This course provides introduction to fiber optics communication and General communication system and optical communication bands.. Explain the types of fiber optics cable and amplifiers. Transmissio characteristics of fiber optics and Find solutions to the problems of signal attenuation, signal dispersi in optical fiber. Explain the concept of the effect of low power received by optical detectors on the overall system performance.
9. Teaching and Learning Strategies	
Strategy	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 type of simple experiments involving some sampling activities that are interesting to the students.

Course Description Form

10.

11. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3		General introduction to optical communicat	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**
2	3		General communication system, opt communication bands.	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**
3	3		Ray Transmission Theory.	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**
4	3		Modes Theory of optical fiber.	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**
5	3		Optical fiber types.	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**
6	3		Amplifier classes, performance parameter.	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**

Course Description Form

7	3		Amplifiers types.	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**
8	3		Single Modes and Multimode Fiber	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**
9	3		**Mid – term Exam**	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**
1	3		Transmission Characteristics, Attenuation.	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**
1	3		Dispersion.	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**
1	3		Dispersion Compensating Fiber.	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**
1	3		General Characteristics of Optical Sources.	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**

Course Description Form

1	3		Light Emitting Diodes LEDs.	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**
1	3		Laser Diodes.	**Theory, Lecture, a Tutorial**	**Quizzes , Assignmen Activities**

12.Course Evaluation

- Daily exams (10)
- Submission of assignments (5)
- Participation inside the hall (5)
- monthly exams (20)
- Final Exam (60)

13.Learning and Teaching Resources

Required textbooks (curricular books, if any)	[1] T. Schneider, *Nonlinear Optics in Telecommunications*. Springer-Verlarg, 2004. [2] G. P. Agrawal, *Applications of Nonlinear Fiber Optics*, 2 nd. Academic Press, 2008.
Main references (sources)	C. Headley and G. P. Agrawal, *Raman Amplification in Fiber Opt Communication Systems*. USA: Elsevier, 2005.
Recommended books and references (scientific journals, reports...)	

Course Description Form

1. Course Name: English IV
2. Course Code: EE3107
3. Semester / Year: 2025-2026
4. Description Preparation Date: 1/10/2025
5. Available Attendance Forms: Traditional class/ Blended
6. Number of Credit Hours (Total) 3 Number of Units (Total): 30
7. Course administrator's name (mention all, if more than one name)
Name: Ehsan H. Sabbar Email: Ehsan.sabbar@uoanbar.edu.iq
8. Course Objectives

Course Objectives	• This course is designed to enable students achieve academic oral and writt communication in accordance with t standards required at the university level.. • The course integrates all language skills w an emphasis on writing, stimulates studer imagination, and enhances perso expression.. • In thiscourse, students are trained to ap critical thinking skills to a wide range challenging topics from diverse scient subjects. Course activities include writ various types of academic essays, acquir advanced academic vocabulary, a

Course Description Form

	participating in group discussions a debates.

9. Teaching and Learning Strategies

Strategy	- Sudden daily and weekly continuous tests. - Exercises and activities in the classroom. - Guiding students to some sources that contain examples and exerci to benefit from them.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Forget Questions Using a bilingual dictionary Social expressions -1	Unit-1	Theoretical + Discussion	General questions and discussion
2	2	Present tenses Have/ have got Collection: daily life Making conversation	Unit-2	Theoretical + Discussion	General written and oral questions and discussion
3	2	Past tenses Word formation Time expressions Personal	Unit-3	Theoretical + Discussion	discussion

Course Description Form

		information			
4	2	Much/ many- some/ any a few, a little, a lot of Articles Shopping Prices	Unit-4	Theoretical + Discussion	Exam I am general questions and discussion
5	2	Verb patterns-1 Future forms Hot verbs How do you feel?	Unit-5	Theoretical + Discussion	General questions and discussion or exam I
6	2	What ..... Like? Comparatives and superlatives Synonyms and antonyms Directions	Unit-6	Theoretical + Discussion	General questions and discussion
7	2	Progressive Exam-I		Theoretical + Discussion	Monthly exam
8	2	Present perfect For, since Adverbs word pairs Short answers	Unit-7	Theoretical + Discussion	Discussion with to give collective duties
9	2	Have (go) to Should/ must	Unit-8	Theoretical + Discussion	General Questions

Course Description Form

		Words that go together At the doctor's			
10	2	Time clauses If Hot verbs In the hotel	Unit-9	Theoretical + Discussion	General questions and discussion
11	2	Verb patterns-2 Manage to, used to -ed/ -ing adjectives Exclamations	Unit-10	Theoretical + Discussion	General Questions
12	2	Passives Verbs and nouns that go together Notices	Unit-11	Theoretical + Discussion	General questions and discussion
13	2	Second conditional Might Phrasal verbs Social expressions -2	Unit-12	Theoretical + Discussion	General Questions
14	2	Progressive Exam-II		Theoretical + Discussion	Monthly exam
15	2	Practical session (oral exam)		Theoretical + Discussion	Oral exam
1	2	Forget Questions Using a	Unit-1	Theoretical + Discussion	General questions and discussion

Course Description Form

		bilingual dictionary Social expressions -1			

11. 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

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	• John & Liz Soars, "New Headway Plus- Intermediate Student's Book", 10th ed 2012
Main references (sources)	• John & Liz Soars, "New Headway Plus- Intermediate Student's Book", 10th ed 2012
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	https://elt.oup.com/student/headway/preint4/?cc=global&selL guage=en

Course Description Form

1. Course Name: electrical power 3
2. Course Code: EE 4336
3. Semester / Year: first semester 2025 -2026
4. Description Preparation Date:2025/10/2
5. Available Attendance Forms: Attendance
6. Number of Credit Hours (Total) 3 Number of Units (Total):3
7. Course administrator's name (mention all, if more than one name)
Name: omar kamil dahham alazzawi Email: omar.dahham@uoanbar.edu.iq
8. Course Objectives

Course Objectives	A – Introducing the student to the power system and extracting variables to prepare him to be an engineer capable of design and calculating all requirements.

9. Teaching and Learning Strategies

Strategy	Daily surprise tests and continuous weekly tests. - Exercises and activities in the classroom. - Guiding students to some sources that contain examples a exercises to benefit from them

10. Course Structure

Course Description Form

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction of power system	Unit 1	Theoretical + Discussion	General questions and discussion
2	3	Per unit system	Unit 1	Theoretical + Discussion	General written and oral questions and discussion
3	3	Balanced fault	Unit 2	Theoretical + Discussion	discussion
4	3	Calculation of balance fault	Unit 2	Theoretical + Discussion	Exam I am general questions and discussion
5	3	Z- bus	Unit 3	Theoretical + Discussion	General questions and discussion or exam I
6	3	Symmetrical components	Unit 3	Theoretical + Discussion	General questions and discussion
7	3	Calculation of Symmetrical components	Unit 3	Theoretical + Discussion	Monthly exam
8	3	unbalanced faults	Unit 3	Theoretical + Discussion	Discussion with to give collective duties
9	3	L-G fault	Unit 3	Theoretical + Discussion	General Questions
10	3	L-L fault	Unit 3	Theoretical + Discussion	General questions and discussion
11	3	L-L-G fault	Unit 3	Theoretical + Discussion	General Questions
12	3	Calculation of unbalanced faults	Unit 3	Theoretical + Discussion	General questions and discussion
13	3	Calculation of unbalanced faults	Unit 3	Theoretical + Discussion	General Questions
14	3	Calculation of unbalanced faults	Unit 3	Theoretical + Discussion	Monthly exam
15	3	summary		Theoretical + Discussion	Oral exam

Course Description Form

11. 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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	(**Elements of power systems analysis by Stevenson** **Modern power system**
Main references (sources)	(**Elements of power systems analysis by Stevenson** **Modern power system**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name: **Programmable Logic Controller**
2. Course Code: **E4345**
3. Semester / Year: Second / Fourth Academic Year
4. Description Preparation Date: 1/12/2025
5. Available Attendance Forms:
6. Number of Credit Hours (Total) 45 Number of Units (Total): 45
7. Course administrator's name (mention all, if more than one name)
Name: Maath Jasem Mahammad Email: math.mahammad@uoanbar.edu.iq
8. Course Objectives

Course Objectives	• The goals of this course are to introduce students to fundamentals of Programmable Logic Controllers (PL and Industrial Automation. • Upon this course, students will be able to describe P components, interface transducer and actuator to PLC p and create PLC ladder logic diagrams.

9. Teaching and Learning Strategies

Strategy	- Describe the basic properties of PLC architecture and recognize different types of communications techniques with PLC. - Identify the important transducer and actuator devices used with PLC. - Learning the programming of PLC via ladder logic diagrams.

Course Description Form

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3	Introduction to Programmable logic controllers	Introduction to Programmable logic controllers	Theoretical + Discussion	General questions and discussion
2	3	Internal architecture of PLC	Internal architecture of PLC	Theoretical + Discussion	General written and oral questions and discussion
3	3	Input-output devices	Input-output devices	Theoretical + Discussion	discussion
4	3	I/O processing	I/O processing	Theoretical + Discussion	Exam I am general questions and discussion
5	3	Ladder programming	Ladder programming	Theoretical + Discussion	General questions and discussion or exam I
6	3	functional block programming	functional block programming	Theoretical + Discussion	General questions and discussion
7	3	PLC Program examples	PLC Program examples	Theoretical + Discussion	Monthly exam
8	3	PLC Program examples	PLC Program examples	Theoretical + Discussion	Discussion with to give collective duties
9	3	Exam	Exam	Theoretical + Discussion	General Questions
10	3	Internal relays	Internal relays	Theoretical + Discussion	General questions and discussion
11	3	Types of timers	Types of timers	Theoretical + Discussion	General Questions
12	3	Programming timers	Programming timers	Theoretical + Discussion	General questions and discussion

Course Description Form

13	3	Forms of counter	Forms of counter	Theoretical + Discussion	General questions and discussion
14	3	Programming counter	Programming counter	Theoretical + Discussion	General questions and discussion
15	3	Exam	Exam	Theoretical + Discussion	Monthly exam

11. Course Evaluation

- Daily exams
- Submission of assignments
- Participation inside the hall
- Semi-semester and monthly exams

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	- W. Bolton, " Programmable Logic Controllers " - Dag H. Hanssen, "Programmable Logic Controllers"
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	https://ladderlogicworld.com https://www.rockwellautomation.com

Course Description Form

1. Course Name: Power system analysis
2. Course Code: EE4426
3. Semester / Year: second semester fourth 2025-2026
4. Description Preparation Date:2025/10/2
5. Available Attendance Forms: Attendance
6. Number of Credit Hours (Total) 3 Number of Units (Total):3
7. Course administrator's name (mention all, if more than one name)
Name: omar kamil dahham alazzawi Email: omar.dahham@uoanbar.edu.iq
8. Course Objectives

Course Objectives	– A – Introducing the student to the power system a extracting its variables to prepare him to be an engineer capa of designing and calculating all requirements.

9. Teaching and Learning Strategies

Strategy	Daily surprise tests and continuous weekly tests. - Exercises and activities in the classroom. - Guiding students to some sources that contain examples a exercises to benefit from them

10. Course Structure

Course Description Form

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introduction of power system analysis	Unit 1	Theoretical + Discussion	General questions and discussion
2	3	Y-bus	Unit 1	Theoretical + Discussion	General written and oral questions and discussion
3	3	Introduction of load flow	Unit 2	Theoretical + Discussion	discussion
4	3	Load flow	Unit 2	Theoretical + Discussion	Exam I am general questions and discussion
5	3	Newton Raphson method	Unit 2	Theoretical + Discussion	General questions and discussion or exam I
6	3	Calculation of Newton Raphson method	Unit 2	Theoretical + Discussion	General questions and discussion
7	3	G.S method	Unit 2	Theoretical + Discussion	Monthly exam
8	3	Calculation of G.S method	Unit 2	Theoretical + Discussion	Discussion with to give collective duties
9	3	Introduction of power system stability	Unit 3	Theoretical + Discussion	General Questions
10	3	Stady stat stability	Unit 3	Theoretical + Discussion	General questions and discussion
11	3	Calculation of study stat stability	Unit 3	Theoretical + Discussion	General Questions
12	3	Transient stability	Unit 3	Theoretical + Discussion	General questions and discussion
13	3	Calculation of study Transient stability	Unit 3	Theoretical + Discussion	General Questions
14	3	Power system protection	Unit 3	Theoretical + Discussion	Monthly exam
15	3	Power system protection	Unit 3	Theoretical + Discussion	Oral exam

Course Description Form

11. 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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	(**Elements of power systems analysis by Stevenson** **Modern power system**
Main references (sources)	(**Elements of power systems analysis by Stevenson** **Modern power system**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name: Engineering Numerical Methods
2. Course Code: EE3211
3. Semester / Year: First / Fourth Academic Year 2025-2026
4. Description Preparation Date:15/9/2025
5. Available Attendance Forms: Traditional class/ Blended
6. Number of Credit Hours (Total) 45 Number of Units (Total):3
7. Course administrator's name (mention all, if more than one name)
Name: Ass. Prof. Eng. Falah Shallal Khaleefah mail: f.sh.khalifa@uoanbar.edu.iq
8. Course Objectives

Course Objectives	**-The numerical methods course involves solving engineering problems dra from all fields of engineering.** **-The numerical methods include: Error analysis, roots of nonlinear algebr equations, solution of linear and transcendental simultaneous equations, ma and vector manipulation, curve fitting and interpolation, numerical integrat and differentiation, solution of ordinary and partial differential equations..**

9. Teaching and Learning Strategies

Strategy	- Sudden daily and weekly continuous tests. - Exercises and activities in the classroom. -Guiding students to some sources that contain examples a exercises to benefit from them.

Course Description Form

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Numerical	Error analysis	Theoretical Discussion	General questions and discussion
2	2	Numerical	Roots of nonlinear Algebraic equations.	Theoretical Discussion	General questions and discussion
3	2	Numerical	Roots of nonlinear Algebraic equations	Theoretical Discussion	General questions and discussion
4	2	Numerical	Solution of linear a simultaneous equation	Theoretical Discussion	General questions and discussion
5	2	Numerical	Solution of lin equations.	Theoretical Discussion	General questions and discussion
6	2	Numerical	Matrix and vec manipulation	Theoretical Discussion	General questions and discussion
7	2	Numerical	Matrix and vector manipulation	Theoretical Discussion	General questions and discussion
8	2	Numerical	Curve fitting a	Theoretical Discussion	General questions and discussion
9	2	Numerical	interpolation.	Theoretical Discussion	General questions and discussion
10	2	Numerical	Curve fitting a interpolation	Theoretical Discussion	General questions and discussion
11	2	Numerical	Numerical integration	Theoretical	General questions and discussion
12	2	Numerical	Numerical integration	Theoretical Discussion	General questions and discussion
13	2	Numerical	Numerical differentiati	Theoretical Discussion	General questions and discussion
14	2	Numerical	Numerical differentiati	Theoretical Discussion	General questions and discussion
15	2	Numerical	Solution of differen equations	Theoretical Discussion	General questions and discussion

11. Course Evaluation

Course Description Form

- Daily exams - Submission of assignments - Participation inside the hall - Semi-semester and monthly exams	
12. Learning and Teaching Resources	
Required textbo (curricular books, any)	1. Applied numerical analysis, Curtis F. Gerald and Patr O. wheatley 2. Chapra & Canale "Numerical Methods for Engineers". 3. Numerical analysis, purna Chandra Biswal
Main referen (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websi	Internet and YouTube

Course Description Form

1. Course Name:
Management and Leadership Skills
2. Course Code:
EE4108
3. Semester / Year:
Fourth academic year/first semester
4. Description Preparation Date:
01/10/2025
5. Available Attendance Forms:
Attendance education
6. Number of Credit Hours (Total) Number of Units (Total):
30 2
7. Course administrator's name (mention all, if more than one name)
Name: Dr.muanna waleed naji Email: muanna.naji@uoanbar.edu.iq
8. Course Objectives
➢ Raising the student's personal level and building his intellectu renaissance by demonstrating the importance of management, leadersh and professional ethics in his professional and social life. ➢ Develop awareness of the challenges he faces in his daily and practical life ➢ Develop awareness of management and leadership.
9. Teaching and Learning Strategies
➢ After completing this course, students will be able to: 1. Explain the basic concepts of management, leadership and professio ethics. 2. Build personal power and influence decision-making. 3. Give and receive feedback, listen actively, provide supporti communication, and coach and mentor team members. 4. Developing intellectual capacity in the field of leadership ethics a administrative ethics, to acquire intellectual and verbal ability and skill.

Course Description Form

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	Fundamentals of professional ethics	A brief overview of professional ethics and its impact on building civilization in the field of professional production	theoretical	General questions and discussion
Second	2	Fundamentals of professional ethics	Defining professional ethics and explaining the most important values and principles related to it	Theoretical	General questions, discussion and exam
Third	2	Professional Ethics Strategies	Goals and sources of professional ethics	Theoretical	General questions and discussion
Fourth	2	Professional Ethics Strategies	Means of establishing professional ethics and determinants that contribute to developing and enhancing values among its employees	Theoretical	General questions and discussion
Fifth	2	Management and Leadership	Introducing leadership, leadership and leader skills	Theoretical	General questions and discussion
Sixth	2	Management principles	Planning and organizing	Theoretical	Monthly exam
Seventh	2	Management principles	Censorship And guidance	Theoretical	Collective assignments
Eighth	2	Management principles	project management	Theoretical	General questions & discussion
Ninth	2	Management and Leadership	The rights of the employee from the workplace, and an explanation of the most important pillars of work ethics, along with an explanation of the stages through which an individual often develops ethical standards.	Theoretical	General questions & discussion
Tenth	2	Management and Leadership	The steps through which an individual can demonstrate work ethics, and explain the impact of employee moral	Theoretical	General questions & discussion

Course Description Form

			corruption and the deviation it causes in his personal behavior and actions related to his field of work and profession.		
Eleventh	2	Management and Leadership	Employee rights from the employer, and its impact on achieving the strategic goals of the institution	Theoretical	Monthly exam
Twelfth	2	Distinctive leadership	The most important qualities of a leader and successful leadership	Theoretical	Daily exam and activities
Thirteenth	2	Traits of a leader and manager	Effective team leadership	Theoretical	Discussion and exam
Fourteenth	2	Leadership Success	Creating leaders and leaders of change.	Theoretical	General questions and discussion
Fifteenth	2	Personal building for the manager, leader and employee	Factors of personal construction of the engineer in his professional and social life	Theoretical	General questions and discussion

11. Course Evaluation

The grade is distributed out of 100 according to the tasks assigned to the student, such as:

- Daily participation, reports.
- Tests (daily sometimes, monthly, final)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Lectures on management, leadership skills and professi ethics
Main references (sources)	➢ Benator, Barry and Thumann, Albert "Project Management and Leadership Skills for Engineering and Construction Projects." 2003, The Fairmont Press, Inc., USA Fleddermann, C. B. (2012). Engineering Ethics.
Recommended books and references (scientific journals, reports...)	Code of Ethics - Iraqi Engineers Syndicate
Electronic References, Websites	**1. Management:** • **Title:** Management: Modern Principles and Foundations • **Author:** Richard L. Daft (Arabic Translation)

Course Description Form

	2. Leadership: • **Title:** The Comprehensive Reference for Leadership and Leader-Building • **Books:** *The Leader Who Had No Title* or *The Greatness Guide* • **Author:** Robin Sharma (Arabic Translation)

Course Description Form

1. Course Name: Power electronics
Power electronics
2. Course Code: EE4337
3. Semester / Year: Second Semester 2025-2026
4. Description Preparation Date: 1/12/2026
5. Available Attendance Forms: E- presence
6. Number of Credit Hours (Total) 60 Number of Units (Total):4
7. Course administrator's name (mention all, if more than one name)
Name: Ass. Prof. Falah Shallal Khaleefah Email: f.sh.khalifa@uoanabr.edu.iq
8. Course Objectives

Course Objectives	**A. The student acquires detailed information about the electronic elements and t properties that qualify them to be used in power electronics……** **B. The course aims to study some of the three-phase controlled units, where th units convert the alternating source voltage and has a constant effective value int variable continuous face, where it is controlled by ignition motors of electronic k used in this circuit.** **C- The course aims to study some DC sections, as these sections aim to conve voltage constant source to constant voltage variable value and can be controlled controlling circuits Ignition of electronic keys used in section wires at the time separating and closing electronic keys.** **D- The course aims at some single-phase inverters, where these inverters are use convert the constant source voltage into a constant alternating voltage or variable va where this voltage is controlled by controlling the closing and disconnection time of electronic keys used in these inverters and also by controlling the value of the required to separate and close these electronic switches.**

Course Description Form

9. Teaching and Learning Strategies

Strategy	-Continuous sudden and weekly daily tests. - Exercises and activities in the classroom. - Guiding students to some sources that contain examples a exercises to benefit from them.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Introduction to Electronics Capability	Power Electronics	Theoretical + Discussion	General questions and discussion
2	4	Semiconductors and their properties.	Power Electronics	Theoretical + Discussion	General questions and discussion or
3	4	Semiconductors and their properties.	Power Electronics	Theoretical + Discussion	General questions and discussion
4	4	Semiconductors and their properties.	Power Electronics	Theoretical + Discussion	General questions and discussion.
5	4	AC TO DC CONVERTER (RECTIFIERS)	Power Electronics	Theoretical + Discussion	General questions and discussion or
6	4	AC TO DC CONVERTER (RECTIFIERS	Power Electronics	Theoretical + Discussion	General questions and discussion
7	4		Power Electronics		Mid-term exam
8	4	DC TO AC CONVERTER (INVERTERS)	Power Electronics	Theoretical + Discussion	General questions and discussion
9	4	DC TO AC CONVERTER (INVERTERS	Power Electronics	Theoretical + Discussion	General questions and discussion
10	4	DC to DC Convertor	Power Electronics	Theoretical + Discussion	General questions and discussion exam
11	4	DC to DC Convertor	Power Electronics	Theoretical + Discussion	General Questions
12	4	AC to AC Controller	Power Electronics	Theoretical + Discussion	Discussion and exam I

Course Description Form

13	4	AC to AC Controller	Power Electronics	Theoretical + Discussion	General Questions
14	4	Revision	Power Electronics	Theoretical + Discussion	Group Duties+ discussion
15	4		Power Electronics		Monthly exam

11. 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

12. Learning and Teaching Resources

Required textbo (curricular books, if any	(1) M.H. Rashid, 'Power Electronics: Circuits, Devices and Applications', Pearson Education, PHI Third Edition, New Delhi, 2004 (2) Power Electronics DanielW. Hart Valparaiso University Valparaiso, Indi (3) Interactive of Power Electronic
Main references (sourc	
Recommended books and references (scientific journals, reports…)	
Electronic Referenc Websites	

Course Description Form

1. Course Name: Digital communication lab.

2. Course Code:EE329

3. Semester / Year: Second/2025-2025

4. Description Preparation Date:1/12/2026

5. Available Attendance Forms:

6. Number of Credit Hours (Total) 45 Number of Units (Total):4

7. Course administrator's name (mention all, if more than one name)

Name: Ass. Prof. Falah Shallal Khaleefah
mail: F.sh.khalifa@uoanabar.edu.iq

8. Course Objectives

Course Objectives	**Carrying out various experiments in digital communication modulation schemes using prepared modules. Some modulations schemes are simulate using Matlab.**

9. Teaching and Learning Strategies

Strategy	- Sudden daily and weekly continuous tests. - Exercises and activities in the classroom. - Guiding students to some sources that contain examples a exercises to benefit from them.

Course Description Form

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	ADC DAC	Experiment 1	Theoretical + practical	Report+ Discussion
2	3	PCM	Experiment 2	Theoretical + practical	Report+ Discussion
3	3	PCDEMOD	Experiment 3	Theoretical + practical	Report+ Discussion
4	3	PW Modulation	Experiment 4	Theoretical + practical	Report+ Discussion
5	3	PW Demodulation	Experiment 5	Theoretical + practical	Report+ Discussion
6	3	TDM	Experiment 6	Theoretical + practical	Report+ Discussion
7	3	ASK	Experiment 7	Theoretical + practical	Monthly exam
8	3	Mid-term exam		Theoretical + practical	
9	3	ASK	Experiment 8	Theoretical + practical	Report+ Discussion
10	3	FSK	Experiment 9	Theoretical + practical	Report+ Discussion
11	3	FSK	Experiment 10	Theoretical + practical	Report+ Discussion
12	3	PSK	Experiment 11	Theoretical + practical	Report+ Discussion
13	3	PSK	Examination 12	Theoretical + practical	Report+ Discussion

Course Description Form

14	3	MPSK	Experiment 13	Theoretical + practical	Report+ Discussion
15	3	Final course exam	-	Theoretical + practical	Oral + practical exam

11. 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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Laboratory sheet prepared department lecturers
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	