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

Academic Program and Course Description Guide

Department of Communications and Intelligent Digital Systems Engineering

2025-2026

Introduction:

The academic program is considered a coordinated and organized package of courses that includes procedures and experiences arranged as study units, whose primary purpose is to build and refine graduates' skills, making them qualified to meet the requirements of the labor market. It is reviewed and evaluated annually through internal or external audit procedures and programs, such as the External Examiner Program.

The academic program description provides a concise summary of the key characteristics of the program and its courses, outlining the skills intended to be imparted to students, built in accordance with the academic program's objectives. The importance of this description lies in the fact that it represents the cornerstone in obtaining program accreditation. It is written collaboratively by the teaching staff under the supervision of the scientific committees within the academic departments.

This guide, in its first edition, includes a description of the academic program in light of the latest developments and updates in the educational system in Iraq, which incorporates the academic program description circulated pursuant to the letter of the Directorate of Studies No. T.M.3/2906 dated 3/5/2023, about programs that adopt the Bologna Process as the basis for their operation.

In this regard, we cannot but emphasize the importance of writing descriptions for academic programs and courses in order to ensure the smooth progress of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: **University of Mosul**

Faculty/Institute: **College of Engineering**

Scientific Department: **Department of Communications and Intelligent Digital Systems Engineering**

Academic or Professional Program Name: **Bachelor Science of Communications and Intelligent Digital Systems Engineering**

Final Certificate Name: **Bachelor Science of Communications and Intelligent Digital Systems Engineering**

Academic System: Bolonga

Description Preparation Date: Sept. 2025

File Completion Date: Sept. 2025

Signature:

Head of Department Name:
Asst. Prof. Dr. Mohammad Tariq Yaseen

Date: April, 7th, 2026

Signature:

Scientific Associate Name:
Assist. Prof. Dr. Ayman Talib Hamed

Date: 7-4-2026

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:
Asst. Prof. Rana Burhan Abdulrahman

Date: April/7th/2026

Signature:

Approval of the Dean

University of Mosul
Dean Office
College of Engineering

Prof Omar M. Hamdoon

7-4-2026

1. Program Vision

To achieve distinction and leadership in education, research, innovation, and community service in Communications and Intelligent Digital Systems, by advancing smart connectivity, digital transformation, and secure intelligent technologies that serve society and sustainable development.

2. Program Mission

To provide an educational program characterized **in communications and intelligent digital systems Engineering** and to generate and disseminate engineering knowledge through high-impact research and applied solutions. The Department also aims to support industrial and governmental projects via consultancy, training, and partnerships that address real technical challenges in the community.

3. Program Objectives

1. Preparing specialized engineering professionals in communications, intelligent digital systems, computer networks, signal processing, the Internet of Things, AI-supported communications, and information and communication security, in a manner that meets labor-market needs in modern technologies and contributes to national digital and electronic development.
2. Providing academic, scientific, applied, and consultancy services to the public and private sectors in intelligent systems technologies through cooperation agreements via the advisory structures of the College of Engineering.
3. Conducting applied and innovative research that contributes to solving engineering, industrial, and digital transformation problems, with measurable outcomes suitable for publication in reputable journals and conferences.
4. Disseminating and transferring the latest technological developments to engineers and practitioners through continuing education, professional training courses, workshops, and specialized short programs.
5. Developing the capabilities of the academic staff and enhancing international engagement through participation in conferences, joint research, seminars, collaborative workshops, academic exchange with Arab and international institutions, and contributing to the organization of scientific events locally and internationally.

4. **Program Accreditation**
The Program is under review by the National Council for Accreditation of Engineering Education (ICAEE)

5. **Other external influences**
None

6. **Program Structure**				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements	8	**17**	14%	
Department Requirements	49	107	86%	
Summer Training	1			
SUM	**58**	**124**	100%	

* This can include notes on whether the course is basic or optional.

7. **Program Description**						
Level 1 – Semester 1						
Requirement Type	**Req. Kind**	**Course Name (English)**	**Theoretical Hours**	**Practical Hours**	**Credit Units** ECTS	**Course Code**
Dept. Req.	Core	Electrical Circuits Analysis	3	2	6.00	CS111
	Basic	Mathematics	3		6.00	CS112
	Supplementary	Engineering Drawing	2	2	5.00	CS113
	Basic	Physics	2		6.00	CS114

University Req.	Supplementary	Democracy and Human Rights	2		2.00	UOM1040
	Supplementary	Arabic Language 1	2		2.00	UOM1011
	Basic	Computer 1	1		3.00	UOM1031
			15	**6**	**30**	
Total Hours						

Level 1 – Semester 2						
Requirement Type	**Req. Kind**	**Course Name (English)**	**Theoretical Hours**	**Practical Hours**	**Credit Units** ECTS	**Course Code**
Dept. Req.	Core	Physics 1	3	2	6.00	CS121
	Basic	Mathematics 1	3		6.00	CS122
	Core	Digital Techniques	2	2	5.00	CS123
	Supplementary	C Language Programming	2		6.00	CS124
	Basic	Principles of Artificial Intelligence	1	2	3.00	CS125
	Supplementary	Probability and Statistics	2		2.00	CS126
University Req.	Supplementary	English Language 1	2		2.00	UOM1021
Total			15	6	30	

8. Expected learning outcomes of the program

There are 7 Graduate learning outcomes according to ICAEE:

GO1	Ability to identify, formulate, and solve engineering problems in Communications Engineering and Smart Digital Systems by applying engineering, science, and mathematics principles.
GO2	Ability to apply the engineering design process to produce solutions meeting specified needs while considering public health and safety, and global, cultural, social, environmental, and economic factors relevant to the specialization.
GO3	Ability to develop and conduct appropriate experiments, analyze and interpret data, and use engineering judgment to draw conclusions.
GO4	Ability to communicate effectively with a wide range of audiences.
GO5	Ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments that consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
GO6	Ability to recognize the ongoing need to acquire new knowledge, select appropriate learning strategies, and apply this knowledge.
GO7	Ability to function effectively as a member or leader of a team that sets goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment.

Knowledge	
GO1	Ability to identify, formulate, and solve engineering problems in Communications Engineering and Smart Digital Systems by applying engineering, science, and mathematics principles.
GO2	Ability to apply the engineering design process to produce solutions meeting specified needs while considering public health and safety, and global, cultural, social, environmental, and economic factors relevant to the specialization.
GO3	Ability to develop and conduct appropriate experiments, analyze and interpret data, and use engineering judgment to draw conclusions.
GO6	Ability to recognize the ongoing need to acquire new knowledge, select appropriate learning strategies, and apply this knowledge.
Skills	
GO4	Ability to communicate effectively with a wide range of audiences.
GO7	Ability to function effectively as a member or leader of a team that sets goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment.
Ethics	
GO5	Ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments that consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

9. Teaching and Learning Strategies

- Power point lectures
- Whiteboard Lectures
- Tutorial
- Laboratory experiments
- Computer laboratories
- Video lectures
- Team works
- Case Studies

10. Evaluation methods

- Mid-Term and Final exams
- Quizzes
- Technical Reports and Projects
- Laboratory Reports and Exams

11. Faculty

Faculty Members

	Academic Rank	Specialization		Number of the teaching staff	
		General	Special	Staff	Lecturer
Dr. Saad A. Ayoob	Assistant Professor	Electrical Engineering	Communications Engineering	**1**	
Dr. Firas S. Alsharbaty	Assistant Professor	Electrical Engineering	Computer Networks & Communications	1	
Dr. Mohammad Tariq Yaseen	Assistant Professor	Electrical Engineering	Nanotechnology	1	
Dr. Mohammed Younis Thanoun	Assistant Professor	Electrical Engineering	Communications Engineering	1	

Dr. Farhad Ezzulddin Mahmood	Assistant Professor	Electrical Engineering	Electronics and Communications Engineering	1	
Dr. Shamil H. Hussein Alnajjar	Assistant Professor	Electrical Engineering	Electronics Engineering	1	
Dr. Abdulrhman Khalid Salih Alhafid	Lecturer	Electrical Engineering	Communications Engineering	2	
Dr. Yazen S. Sheet	Lecturer	Electrical Engineering	Computer Networks & Communications	2	
Dr. Omar Mustafa Ali Mustafa	Lecturer	Electrical Engineering	Electronics & Communications	2	
Dr. Azam Adnan	Lecturer	Electrical Engineering	Electronics	1	
Dr. Marwan Abdulkhaleq AL Yoonus	Lecturer	Electrical Engineering	Intelligent Digital Systems	1	
Huda Al Tayyar	Lecturer	Electrical Engineering	Antenna and Communications Engineering	1	
Ali Ghanim Saber	Assistant Lecturer	Electrical Engineering	Communications Engineering	1	
Joan Atheel Ahmed	Assistant Lecturer	Architecture Engineering	Smart Sustainability	1	
Lubna Albak	Assistant Lecturer	Computer Engineering	Computer Networks	1	
Karam Anan Al Ghadanfary	Assistant Lecturer	Electrical Engineering	Computer Networks	1	
Bilal Aqeel	Assistant Lecturer	Electrical Engineering	Electrical Engineering	1	
Mohammed Idrees Dawod	Assistant Lecturer	Electrical Engineering	Computer Networks	1	
Mustafa Ismael	Assistant Lecturer	Electrical Engineering	Electrical Engineering	1	
Ali Hadi Saeed	Assistant Lecturer	Electrical Engineering	Communications Engineering	1	

Alaa Abd kareem	Assistant Lecturer	Electrical Engineering	Computer Networks		1

Professional Development

Mentoring new faculty members

The academic program is designed to comprehensively enhance the knowledge and skills of new faculty members across various educational fields. It begins by focusing on equipping faculty with the fundamental ability to effectively manage their courses. It then progresses to encompass the processes and procedures necessary to ensure the successful achievement of targeted learning outcomes in diverse programs.

To achieve these goals, the program includes the following key components:

1. **Educational Courses:** New faculty members participate in educational courses aimed at improving the quality of the educational learning process. These courses cover a range of topics, including:
    - **Training on Teaching Methods:** Instruction on effective strategies for engaging students and delivering course content.
    - **Designing Course Outlines:** Guidance on structuring and organizing course materials to optimize student learning.
    - **Modern Trends in University Teaching:** Exploration of innovative approaches to teaching and learning in higher education.
    - **Evaluating Student Learning:** Techniques for assessing student performance and understanding.
    - **Preparing Tests:** Strategies for creating fair and rigorous assessments.
    - **University Policies:** Familiarization with relevant laws, regulations, instructions, and e-learning platforms.
2. **Continuous Evaluation:** Faculty members, both full-time and part-time, undergo continuous evaluation to identify areas for development throughout their educational careers. This process helps ensure that faculty are continually improving and adapting to meet the evolving needs of students and the university.
3. **Professional Development Opportunities:** Faculty members are encouraged to participate in teaching staff development courses offered by the department or the university's continuing education unit. These courses provide opportunities for faculty to enhance their skills, stay current with trends in education, and collaborate with colleagues.

Professional development of faculty members

The faculty members of the Department of Communications Engineering and Intelligent Digital Systems have links with key ministries in Iraq, including the Ministry of Higher

Education and Scientific Research, the Ministry of Communications, and others. These links provide faculty members with practical experience.

In this context, the Continuing Education Committee of the Department of Communications Engineering and Intelligent Digital Systems organized lectures and workshops for faculty members in various fields during the current academic year.

12.**Acceptance Criterion**

To be eligible for admission to the Electrical Engineering Department at the undergraduate level, applicants must meet certain requirements. The admissions process is overseen by the Ministry of Higher Education and Scientific Research, which electronically manages and allocates student admissions to government institutions and faculties based on their secondary school grades. Here are some of the key requirements for student acceptance:

A- Iraqi Nationality and Year of Birth: Applicants must hold Iraqi nationality and be born in 1999 or later.

B- Iraqi Secondary School Certificate: Applicants need to possess a certificate issued by an Iraqi secondary school that is authorized by the Ministry of Education.

C- Medical Certificate: Applicants must provide a medical certificate to demonstrate that they meet the necessary health requirements.

D- Full-Time Student: Applicants should commit to being full-time students, dedicating their time and efforts to their studies in the department.

E- Not acceptable and continues to study in another college.

F- Non-Iraqi students (arrivals) who obtained a certificate of an Iraqi secondary school admitted according to the central acceptance.

G- Admission 10% of the top graduates of technical institutes.

H- Acceptance of talented students.

13.**The most important sources of information about the program**

1. University Guide
2. College website: https://uomosul.edu.iq/engineering/54516-2/

14.Program Development Plan

To enhance the quality of education, elevate graduate outcomes, and meet the competencies required by increasingly complex societies, the department council has decided to adopt the "Bologna process system of Education." This system incorporates the European Credit Transfer and Accumulation System (ECTS) instead of the traditional course-based system, aligning with the department's commitment to continuous improvement. The adoption of the Bologna process is expected to yield several benefits:

- **Student-Centered Learning:** The system places students at the core of the learning process, enhancing the overall education system.
- **Increased Class Interaction:** The constant engagement between teachers and students promotes a more dynamic learning environment.
- **Focus on Professional and Practical Skills:** Emphasis is placed on acquiring practical skills relevant to professional development.
- **Opportunity for Continuous Learning:** Students will have the opportunity for ongoing learning, assessment, and feedback.
- **Biannual Performance Evaluation:** The system allows for the evaluation of student performance twice a year, providing more comprehensive feedback.
- **Enhanced Subject Understanding:** The system is expected to facilitate a deeper understanding of subjects among students.

Program Skills Outline										
				Required program Learning outcomes						
Year/ Level 2025	Course Code	Course Name	Basic or optional	Knowledge				Skills		Ethics
				GO 1	GO 2	G O3	G O6	G O4	GO 7	GO5
	CS111	Electrical Circuits Analysis	Specialized	✓		✓				
	CS112	Mathematics	Core	✓					✓	
	UOM1031	Engineering Drawing	Core	✓			✓		✓	
	CS113	Physics	Support	✓						
	CS114	Computer 1	Core	✓						
	UOM1040	Democracy and Human Rights	Support	✓						✓
	UOM1011	Arabic Language 1	Support	✓				✓		
	CS126	Probability and Statistics	Specialized	✓						
	CS122	Mathematics 1	Core	✓						
	CS123	Digital Techniques	Core	✓			✓			
	CS 124	C Language Programming	Specialized	✓		✓				
	CS 121	Physics 1	Specialized	✓		✓				
	CS125	Principles of Artificial Intelligence	Core	✓						
	UOM1021	English Language 1	Core					✓	✓	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information **معلومات المادة الدراسية**					
Module Title	**Democracy and Human Rights** **الديمقراطية وحقوق الانسان**			**Module Delivery**	
Module Type	Support			**☒ Theory** **☐ Lecture** **☐ Lab** **☐ Tutorial** **☐ Practical** **☐ Seminar**	
Module Code	**UOM1040**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		**UGI**	**Semester of Delivery**		**1**
Administering Department		**Department of Communications and Intelligent Digital Systems Engineering**	**College**	**Engineering**	
Module Leader	**Asst. Prof. Dr. Mohammad T. Yaseen**		**e-mail**	**mtyaseen@uomosul.edu.iq**	
Module Leader's Acad. Title		**Asst. Prof.**	**Module Leader's Qualification**		**Doctor**
Module Tutor			**e-mail**		
Peer Reviewer Name		**Asst. Prof. Dr. Saad Ahmed Ayoub**	**e-mail**	**sa_ah_ay@uomosul.edu.iq**	
Scientific Committee Approval Date		**1/2/2026**	**Version Number**	**1.0**	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The aim of studying the democracy and human rights topics is to: 1. **Understand** the concept of human rights and explore their sources, including international, regional, national, and religious sources. 2. **Define** administrative corruption, explore its types, and understand its detrimental effects on society. Study methods to combat administrative corruption and promote transparency, accountability, and good governance. 3. **Trace** the historical development and evolution of human rights, examining key milestones and movements that have shaped the modern understanding of human rights. 4. **Differentiate** between different categories of human rights, including civil and political rights, economic and social rights, and environmental, cultural, and developmental rights. 5. **Explore** legal, institutional, and societal guarantees to prevent human rights violations, including guarantees of human rights in Islam, national-level protections, and international safeguards. 6. **Comprehend** the concept of democracy, including its principles, values, and various forms of democratic governance such as direct, semi-direct, indirect, and digital democracy. Overall, studying these topics aims to develop a comprehensive understanding of human rights, democracy, and combating corruption, empowering individuals to actively promote and protect human rights and democratic values in society.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After these module aims, students should be able to: 1. Demonstrate a comprehensive understanding of the concept of human rights and their sources, including international, regional, national, and religious sources. 2. Identify and explain the fundamental characteristics of human rights, such as universality, indivisibility, interdependence, and inalienability. 3. Analyze the historical emergence and evolution of human rights, including key milestones and movements that have shaped their development. 4. Differentiate between different categories of human rights, including civil and political rights, economic and social rights, and environmental, cultural, and developmental rights. 5. Evaluate and apply legal, institutional, and societal guarantees to prevent human rights violations, considering guarantees in Islam, at the national level, and within the international framework. 6. Understand and discuss the concept of democracy, including its principles, values, and different forms of democratic governance. 7. Evaluate the Islamic stance on democracy and engage in critical analysis of the strengths and weaknesses of the democratic system. 8. Recognize and assess the impact of administrative corruption on society and propose methods to combat and prevent corruption in administrative systems. 9. Demonstrate critical thinking skills by analyzing and evaluating different perspectives on human rights, democracy, and corruption. 10. Apply acquired knowledge and skills to promote and protect human rights, democracy, and good governance in personal, professional, and civic contexts.

	Overall, students should have a solid understanding of democracy and human rights, democracy, and corruption issues, and be able to apply this knowledge to contribute to the advancement of human rights and democratic values in society.
Indicative Contents المحتويات الإرشادية	The indicative content includes: 1. Definition and sources of democracy and human rights (international, regional, national, religious). [3h] 2. Characteristics of democracy and human rights: universality, indivisibility, interdependence, inalienability. [3h] 3. Emergence and evolution of human rights: historical development, key milestones, influential movements. [3h] 4. Types of human rights: civil and political, economic and social, environmental, cultural, and developmental. [3h] 5. Guarantees to prevent human rights violations: legal, institutional, societal safeguards, Islamic guarantees, national and international levels. [3h] 6. Concept of democracy: principles, values, forms of governance (direct, semi-direct, indirect). [3h] 7. Islamic stance on democracy: compatibility, strengths, weaknesses. [3h] 8. Critique of the democratic system: analysis of strengths and weaknesses. [3h] 9. Administrative corruption: definition, types, societal impact. [3h] 10. Methods to combat administrative corruption. [3h]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	When it comes to learning and teaching strategies for a human rights module, there are several approaches can be taken to enhance understanding and engagement. Here are some effective strategies: 1. Interactive Discussions: Encourage students to actively participate in discussions, debates, and group activities. This promotes critical thinking, allows for different perspectives to be shared, and fosters a deeper understanding of human rights issues. 2. Case Studies: Present real-life case studies that highlight human rights violations or achievements. Analyzing these cases helps students apply theoretical concepts to practical situations and develops their problem-solving skills. 3. Research Projects: Assign research projects on specific human rights topics or issues. This encourages independent learning, critical analysis, and the development of research skills. 4. Collaborative Learning: Foster collaboration among students through group projects or assignments. This encourages teamwork, peer learning, and the exchange of diverse perspectives. 5. Assessment Variety: Use a variety of assessment methods, including essays, presentations, debates, and quizzes, to assess students' understanding of human rights concepts and their ability to apply them to real-world situations.
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
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation
تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	8% (16)	5, 10	LO #2, 4, 6 and 8
	Assignments	3	6% (12)	3, 5, 11	LO # 1, 3, 7, 6, 9 and 10
	Classwork	5	5% (5)	Continuous	ALL
	Report	7	7% (7)	11	LO # 2,4,5,7,9 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	12	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Definition of human rights and sources of rights (international sources / regional sources / national sources / religious sources).
Week 2	Characteristics of human rights.
Week 3	The emergence and evolution of human rights.
Week 4	Types of human rights / civil and political rights. Economic and social rights. Environmental, cultural, and developmental rights.
Week 5	Guarantees to prevent human rights violations / guarantees of human rights in Islam.
Week 6	Guarantees for the protection of human rights at the national level.
Week 7	Guarantees of human rights at the international level.
Week 8	The concept of democracy.
Week 9	Characteristics of a democratic system.
Week 10	Forms of democratic governance (direct democracy / semi-direct democracy / indirect democracy).
Week 11	Digital democracy / definition and advantages and disadvantages of digital democracy / manifestations of digital democracy.
Week 12	The Islamic stance on democracy.
Week 13	Critique of the democratic system.
Week 14	Administrative corruption / definition and types.
Week 15	Methods to combat administrative corruption.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	ضمانات حقوق الانسان وحمايتها وفقا للقانون الدولي والتشريع الوطني / نبيل عبد الرحمن ناصر الدين	No
Recommended Texts	الديمقراطية وحقوق الانسان / د. امير عبد العزيز	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 1** **الحاسوب 1**			**Module Delivery**	
Module Type	**Basic (B)**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOM1031**				
ECTS Credits	**3**				
SWL (hr./sem)	**75**				
Module Level		UGI	**Semester of Delivery**		1
Administering Department		Department of Communications and Intelligent Digital Systems Engineering	**College**	Engineering	
Module Leader	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title		Asst. Prof.	**Module Leader's Qualification**		PhD
Module Tutor	Asst. Prof. Dr. Mohammed Younis Thnoon		**e-mail**	myounisth@uomosul.edu.iq	
Peer Reviewer Name		Asst. Prof. Dr. Saad Ahmed Ayoub	**e-mail**	sa_ah_ay@uomosul.edu.iq	
Scientific Committee Approval Date		1/1/2026	**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. Provide Fundamental Computer Literacy: Equip students with essential skills to use computers for basic tasks, including hardware and software understanding. 2. Develop Practical Office Skills: Enable students to create documents, spreadsheets, and presentations using common software tools. 3. Foster Digital Communication and Research Skills: Teach effective use of the internet, email, and cloud-based tools for communication and collaboration. 4. Introduce Networking and Security Basics: Educate students on network types, components, and fundamental security practices. 5. Promote Problem-Solving and Troubleshooting: Develop skills to identify and resolve common hardware and software issues. 6. Introduce Artificial Intelligence (AI): Provide an overview of AI concepts, applications, ethical considerations, and its role in modern technology.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Operate a computer system by using an operating system's graphical interface and performing basic file management. 2. Identify and describe the main hardware components of a computer and their functions. 3. Create and format professional documents, spreadsheets, and presentations using office productivity software. 4. Utilize the internet for effective research, communication via email, and collaboration using cloud-based services. 5. Explain basic networking concepts and identify common security threats and protection methods. 6. Apply basic troubleshooting techniques to diagnose and resolve common hardware and software problems. 7. Define Artificial Intelligence (AI), outline its key characteristics, and discuss its applications, ethical challenges, and impact on society.
Indicative Contents المحتويات الإرشادية	**Part 1: Computer Fundamentals** Introduction to Computers: Concepts of hardware, software, data, and information. Computer Components: CPU, memory (volatile and non-volatile), I/O units, storage, and ports. Operating Systems: Basics of common OS, Graphical User Interface (GUI), file and folder management. **Part 2: Office Productivity Software** Word Processing: Document creation, formatting, tables, styles, spell check, and templates. Spreadsheets: Worksheet creation, formatting, formulas, functions, sorting, filtering, pivot tables, and charts.

	Presentation Software: Creating slides, using templates, inserting text/images, transitions, animations, and delivery techniques. **Part 3: Digital Literacy & Communication** Internet and Web Browsers: Computer networks (LAN, WAN), web concepts, search engines, URLs, and domain names. Email and Collaboration: Using electronic mail, sending/receiving messages, and document collaboration. Cloud Computing: Concepts of cloud services and using tools like Google Workspace (Docs, Sheets, Drive, Meet). **Part 4: Networking, Security & Troubleshooting** Networking Basics: Types of networks, basic components, and network security threats. Computer Troubleshooting: Identifying and solving common hardware and software problems, using diagnostic tools. **Part 5: Introduction to Artificial Intelligence (AI)** AI Fundamentals: Definition, history, key characteristics, techniques, and approaches. AI Applications: Uses in smartphones (virtual assistants, adaptive learning), healthcare, education, finance, marketing, and robotics. AI, Ethics & Society: Ethical considerations, privacy, impact on jobs, future trends, and societal impact.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	To ensure comprehensive student engagement and effective skill development, this computer course will employ a blended strategy combining theoretical instruction with extensive hands-on practical sessions. Teaching will utilize smart boards and presentation software to visually explain concepts, followed by guided laboratory exercises where students actively use computers to apply their knowledge in real-world tasks like document creation, spreadsheet analysis, and internet research. This practical approach is further reinforced by troubleshooting activities and explorations of emerging technologies like AI, fostering a problem-solving mindset and ensuring students achieve both digital literacy and a foundational understanding of key modern computing trends.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1

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**	**2**	**6% (12)**	**4,8,12**	**LO #1, 5, 7**
	Assignments	**2**	**2% (4)**	**2 to 12**	**LO #1, 2, 4, 6 7**
	Projects / Lab.	**1**	**50% (20)**	**Continuous**	**All**
	Classwork	**1**	**4% (4)**	**12**	**All**
Summative assessment	**Midterm Exam**	**2 hr.**	**(5+5)% (5+5)**	**8**	**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 Computer: Concepts of Hardware, Software, Data, and Information; Connecting I/O devices and peripherals.
Week 2	Computer Components: Computer portions, Hardware parts, I/O Units, and Memory Types.
Week 3	Computer Components (Cont.): Basic CPU Components, Computer Ports, and Personal Computer features/types.
Week 4	Operating System & GUI: OS basics; User Interface; Using Mouse techniques.

Week 5	Operating System & GUI (Cont.): Using Icons, Menus, Status Bars; Managing Folders/Directories; Creating Shortcuts.
Week 6	Word Processing: Word Processor basics; Creating, formatting text and paragraphs; Using Templates.
Week 7	Word Processing (Cont.): Creating and managing Tables; Using Styles, Spell Check, Headers, and Footers.
Week 8	Spreadsheet: Introduction to spreadsheets; Creating, formatting worksheets; Sorting, filtering data.
Week 9	Spreadsheet (Cont.): Using Formulas, Functions, Pivot Tables; Data validation and creating Charts.
Week 10	Presentation Software: Introduction to presentation tools; Creating slides with Templates, text, and images.
Week 11	Presentation Software (Cont.): Adding Transitions/Animations; Using Speaker Notes, Hyperlinks, and Action Buttons.
Week 12	Internet & Web Browsers: Computer Networks (LAN, WAN); Internet concepts and applications; Connecting online.
Week 13	Internet & Web Browsers (Cont.): World Wide Web; Web Browsing software; Search Engines; Understanding URLs & Domains.
Week 14	Communications and Emails: Basics of email; Getting an account; Sending, receiving, and managing emails.
Week 15	Cloud Computing & Services: Definition of Cloud Computing; Using Cloud-Based suites (Office 365, Google Workspace).
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Numerical Analysis Using MATLAB® and Excel® Third Edition, Steven T. Karris.	No
Recommended Texts	2- ELEMENTARY MATHEMATICAL and COMPUTATIONAL TOOLS for ELECTRICAL and COMPUTER ENGINEERS USING MATLAB, Jamal T. Manassah City College of New York,2011	No
Websites	References & Suggested Books 1. International Textbooks: • Brown, G., & Watson, D. (2020). *Cambridge IGCSE Information and Communication Technology* (3rd ed.). • Evans, A., Martin, K., & Poatsy, M. A. (2020). *Technology In Action Complete* (16th ed.). • Banafa, A. (2024). *Introduction to Artificial Intelligence (AI)* (1st ed.). • Frye, C., & Lambert, J. (2019). *Microsoft Office 2019 Step by Step* (1st ed.). 2. Arabic Textbooks:	

	• ع، الخضر. (2016). *اساسيات الحاسوب*[Computer Fundamentals]. • ع، عبدالنور. (2005). *مدخل إلى عالم الذكاء الاصطناعي*[Introduction to the World of Artificial Intelligence].

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	**Electrical Circuits Analysis** **تحليل الدوائر الكهربائية**			**Module Delivery**	
Module Type	**Core (C)**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS111**				
ECTS Credits	**6**				
SWL (hr./sem)	**150**				
Module Level		UGI	**Semester of Delivery**		1
Administering Department		Department of Communications and Intelligent Digital Systems Engineering	**College**	Engineering	
Module Leader	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title		Assist. Prof.	**Module Leader's Qualification**		Doctor
Module Tutor	Dr. Marwan A. Thnoon		**e-mail**	**marwanathy1972@uomosul.edu.iq**	
Peer Reviewer Name		Asst. Prof. Dr. Saad Ahmed Ayoub	**e-mail**	sa_ah_ay@uomosul.edu.iq	
Scientific Committee Approval Date		1/2/2026	**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	**(Theory)** 1. To develop problem solving skills and understanding of DC circuit theory through the application of techniques. 2. To understand voltage, current and power from a given DC circuit. 3. This course deals with the basic concept of DC electrical circuits. 4. This is the basic subject for all DC electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis. 7. To perform Thevenin and superposition theory. **(LAB):** 8. To handle laboratory equipment and electrical elements professionally and scientifically. 9. To analyze electrical circuits and comprehend their operational principles. 10. To cultivate a scientific mindset in the student by interpreting practical results based on theoretical concepts. 11. To enhance the student's capability to design basic electronic circuits in accordance with their scientific aptitude. 12. To analyze and simulate circuit processes using various software tools on electronic calculators and compare the analysis results with practical outcomes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**(Theory):** 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. Describe electrical voltage, current and power. 5. Define Ohm's law. 6. Identify the basic circuit passive and active elements and their applications. 7. Discuss the various properties of resistors. 8. Explain the two Kirchhoff's laws used in circuit analysis. 9. Explain the Analysis Methods used in Electrical Circuits. **(LAB):** 10. Dealing with laboratory equipment and electrical elements in a professional and scientific manner(i). 11. Ability to analyze electrical circuits and understand the nature of their work(ii). 12. Building a scientific mentality for the student through his ability to interpret the practical results according to theoretical concepts(iii). 13. Develop the student's ability to design simple electronic circuits in line with his scientific abilities(iv). 14. Analyze and simulate the process circuit using different software on the electronic calculator and match the results of the analysis with the practical results(v).
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **<u>Part A - Circuit Components and values</u>** DC circuits, Current and voltage definitions, Passive sign convention and circuit elements, Resistive networks, real and ideal elements, voltage and current sources. [9 hrs.] Lab. [6 hrs.] Revision problem and tutorial classes [6 hrs.] Quizzes [1 hr.] **<u>Part B- Circuit reduction</u>** combining sources, Combining resistive elements in series and parallel, delta and star transformation. [12 hrs.] Revision problem and tutorial classes [8 hrs.] Lab. [8 hrs.] Quizzes [1 hr.] **<u>Part C- Circuit Theory</u>** Kirchhoff's laws and Ohm's law. Introduction to mesh and nodal analysis, Introduction to Thevenin and Norton theory, maximum power transfer, introduction to superposition theory. [24 hrs.]

	Revision problem and tutorial classes [16 hrs.] Lab. [16 hrs.] Quizzes [1 hr.]

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 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	57	**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					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**2**	**6% (12)**	**4,8**	**LO #1, 5, 8 and 9**
	Assignments	**3**	**4% (12)**	**2 to 12**	**LO #1, 2, 4, 6 7, 8 and 9**
	Projects / Lab.	**1**	**30% (12)**	**Continuous**	**All**
	Classwork	**1**	**4% (4)**	**12**	**All**
Summative assessment	**Midterm Exam**	**2 hr.**	**(10%) (7 +3 lab)**	**13**	**LO # 1-5**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Basic Concept & Units: Electricity & atomic structure of substance, current and current density, current flow, electric circuit, E.M. F& potential difference
Week 2	international system of unit, abbreviation for multiples & sub-multiples, quantities derived from SI units, units of force-energy-torque and power, relation between energy and heat, electric units, efficiency & percentage efficiency, electromechanical equivalent of element
Week 3	Ohm's law, resistivity & conductivity
Week 4	temperature affect, internal resistance of a source, open circuit & short circuit
Week 5	equivalent resistance: Series-parallel-circulating current method-floating source method & grouping of E.M.F. sources, double subscript
Week 6	power calculation in D.C circuit
Week 7	Kirchhoff's laws: KVL-KCL
Week 8	Mid-term Exam
Week 9	introduction to network theorems, types of sources: independent and dependent voltage and current sources and their transformation
Week 10	Maxwell's circulating currents (mesh analysis)
Week 11	nodal analysis
Week 12	superposition theorem
Week 13	Thevenin's theorem and Norton's theorem
Week 14	maximum power transfer theorem
Week 15	millman theorem, substitution theorem and reciprocity theorem
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to lab. components
Week 2	Lab 2: Introduction to AVO meter (analog and digital)
Week 3	Lab 3: Introduction to resistance measurements (practical and color code)
Week 4	Lab 4: resistance temperature affect, internal resistance of a source, open circuit & short circuit
Week 5	Lab 5: ohm's Law
Week 6	Lab 6: series and parallel resistance
Week 7	Lab 7: resistance delta and star transformation
Week 8	Lab 8: Kirchhoff's Voltage Law
Week 9	Lab 9: Kirchhoff's Current Law
Week 10	Lab 10: implementation of Maxwell's circulating currents (mesh analysis)
Week 11	Lab 11: implementation of Nodal analysis
Week 12	Lab 12: implementation of Superposition theorem
Week 13	Lab 13: implementation of Thevenin's / Norton's Theorem

Week 14	Lab 14: implementation of maximum power transfer theorem
Week 15	Lab 15: DC power measurements (methods and instrumentations)

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Engineering Circuit Analysis 7th Edition by William Hayt , Jack Kemmerly , Steven Durbin	Yes
Recommended Texts	Schaum's Outline of Basic Circuit Analysis, Second Edition (Schaum's Outlines) 2nd Edition, by John O'Malley	No
Websites	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2017.	

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** **الرسم الهندسي**			**Module Delivery**	
Module Type	**Support (S)**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS113**				
ECTS Credits	**5**				
SWL (hr./sem)	**125**				
Module Level		UGI	**Semester of Delivery**		1
Administering Department		Department of Communications and Intelligent Digital Systems Engineering	**College**	Engineering	
Module Leader	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title		Asst. Prof.	**Module Leader's Qualification**		Doctor
Module Tutor	جوان اثيل احمد		**e-mail**	**joan.akrawi@uomosul.edu.iq**	
Peer Reviewer Name		Asst. Prof. Dr. Saad Ahmed Ayoub	**e-mail**	**sa_ah_ay@uomosul.edu.iq**	
Scientific Committee Approval Date		1/2/2026	**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	13. To develop the engineer's ability to imagine projections and their models. 14. Engineering drawing exercises hand movement to complete quick sketches. 15. This course deals with theory of Orthographic Projection. 16. This is the basic subject for isometric drawing. 17. To teach students engineering drawings using AutoCAD program, and this includes both theoretical lectures and Lab. 18. To help students to use AutoCAD for engineering drawings efficiently in their designs & projects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	15. Absorbing all the engineering characteristics of an object or a product in a clear manner. 16. Know the tools used in engineering drawing and how to use them correctly 17. understand and apply the basics of engineering processes. 18. Conclude projections and isometric for each geometric figure and recognize its dimensions. 19. students will be able to use AutoCAD commands to make drawings 20. create & insert symbols, dimension in a drawing, create blocks, and plot drawings with certain scales.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **<u>Part A – tools, lines, scale, Engineering processes (part 1) & getting started, view commands</u>** Introduction to engineering drawing, learn about engineering tools and how to use them. Types of pens, Billboard layout and address field preparation, Types of lines [3 hrs.] Classwork 1. [2 hrs.] Defining the drawing scale and its types, apply and draw engineering processes [3 hrs.] Classwork 2. [2 hrs.] Lab: Getting started, view Commands [10 hrs.] Quizzes [1 hr.] **<u>Part B- Engineering processes (part 2) , Orthographic Projection (part 1) &Drawing, modify I Commands</u>** Draw tangents, Types of projections resulting from vertical projection. [6 hrs.] Classwork 3. [2 hrs.] , Classwork 4. [2 hrs.] Lab: Drawing Commands, modify I Commands [10 hrs.] Quizzes [1 hr.] **<u>Part C- Orthographic Projection (part 2) , Isometric Drawing & Modify II, Dimensions, text Commands</u>** Arrangement and drawing of projections, draw the isometrically axis, Imagine and draw the isometrically body [8 hrs.] Classwork 5. [2 hrs.] , Classwork 6. [2 hrs.] Lab: Modify II Commands, Dimension Commands, Text Commands [8 hrs.] Quizzes [1 hr.]
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 محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
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	6% (12)	4,8,12	LO #1, 5
	Assignments	2	2% (4)	2 to 12	LO #1, 2, 4, 6
	Projects / Lab.	1	50% (20)	Continuous	All
	Classwork	1	4% (4)	12	All
Summative assessment	**Midterm Exam**	2 hr	10% (5+5 lab)	11	LO # 1-5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction and definition of engineering drawing, learn about engineering tools, Types of pens used, Drawing board layout
Week 2	Types of lines in engineering drawing, Defining the drawing scale and its types
Week 3	Classwork 1
Week 4	Engineering processes (part 1): Teaching students how to apply and draw line relationships

Week 5	Classwork 2
Week 6	Engineering processes (part 2): Making tangents, reverse curves
Week 7	Classwork 3
Week 8	Mid-term Exam
Week 9	Orthographic Projection (part 1): theory of Orthographic Projection, combination of views
Week 10	Classwork 4
Week 11	Orthographic Projection (part 1): Arrangement and drawing of projections
Week 12	Classwork 5
Week 13	Isometric Drawing, I: draw the isometrically axis, Imagine and draw the isometrically body
Week 14	Classwork 6
Week 15	Isometric Drawing II: isometric circles
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: start a new drawing, user Interface, units, limits
Week 2	Lab 2: grid, snap, absolute & relative coordinate system, ortho.
Week 3	Lab 3: zoom, pan, osnap, polar tracking
Week 4	Lab 4: pline, pedit, selecting object, erase
Week 5	Lab 5: ltype, ltscale.
Week 6	Lab 6: line, arc, circle, ellipse
Week 7	Lab 7: polygon, rectangle
Week 8	Lab 8: copy, move, mirror, trim, rotate
Week 9	Lab 9: scale, undo, redo, stretch, divide
Week 10	Lab 10: extend, offset.

Week 11	Lab 11: array, Lweight , Measure
Week 12	Lab 12: Fillet , Chamfer, Explode
Week 13	Lab 13: Text, Mtext, Area
Week 14	Lab 14: Dimensions & Leaders, color
Week 15	Lab 15: Block, plot.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Engineering Drawing and Graphic Technology , By French & Vierk , Steven Durbin , Twelve Edition	No
Recommended Texts	كتاب الرسم الهندسي تأليف : الأستاذ عبد الرسول الخفاف , 1986	No
Websites	دروس تعليم اوتوكاد 2014 : https://www.dailymotion.com/video/x31bg6x	

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	**Physics** **الفيزياء**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS 114**				
ECTS Credits	**6**				
SWL (hr./sem)	**150**				
Module Level		UGI	**Semester of Delivery**		1
Administering Department		Department of Communications and Intelligent Digital Systems Engineering	**College**	Engineering	
Module Leader	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title		Assist. Prof.	**Module Leader's Qualification**		Doctor
Module Tutor	Asst. Prof. Dr. Shamil Hamzah Hussein		**e-mail**	Shamil_alnajjar84@uomosul.edu.iq	
Peer Reviewer Name		Asst. Prof. Dr. Saad Ahmed Ayoub	**e-mail**	sa_ah_ay@uomosul.edu.iq	
Scientific Committee Approval Date		1/2/2026	**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	• **To establish** the fundamental principles of quantum mechanics and atomic models that underpin modern electronics. • **To explain** the energy-band theory of solids and classify materials as conductors, semiconductors, and insulators based on their electronic structure. • **To analyze** charge carrier behavior in semiconductors, including concepts of drift, diffusion, mobility, and conductivity in both intrinsic and extrinsic materials. • **To investigate** the formation and electrical characteristics of the p-n junction, which is the foundational building block of most semiconductor devices. • **To equip** students with the ability to solve practical problems related to carrier statistics, junction properties, and basic device parameters.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. **Explain** the historical development of atomic models and the principles of quantum mechanics relevant to electronics. 2. **Differentiate** between conductors, semiconductors, and insulators using energy-band theory. 3. **Calculate** key parameters such as electron energy, carrier velocity, and photon wavelength in atomic structures. 4. **Analyze** charge transport phenomena, including drift and diffusion currents, in semiconductors. 5. **Determine** the carrier density and Fermi level position in intrinsic and extrinsic semiconductors. 6. **Apply** the principles of the Hall effect to determine material properties like carrier type and density. 7. **Analyze** the formation, biasing, and electrical characteristics of a p-n junction diode. 8. **Compute** critical junction parameters such as barrier potential, depletion width, and junction capacitance.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A:** [**8 hrs**.] **Foundations of Electronics Physics (Approx. 25-30%)** • Atomic Models (Thomson, Rutherford, Bohr) • Quantum Concepts (De Broglie Hypothesis, Photon Energy) • Electron Energy Levels and Spectra • Energy-Band Theory of Solids (Metals, Semiconductors, Insulators) • Fermi-Dirac Statistics Revision problem and tutorial classes [**2 hrs**.] Quizzes [**1 hr**.] **Part B:** [**8 hrs**.] **Semiconductor Properties and Transport Phenomena (Approx. 35-40%)** • Intrinsic and Extrinsic Semiconductors • Carrier Concentration and Fermi Level • Electrical Conductivity, Resistivity, and Mobility • Drift and Diffusion Currents • Work Function and Electronic Emission

	• Hall Effect and its Applications Quizzes [**1 hr**.] **<u>Part C:</u>** [**8 hrs**.] **Semiconductor Devices and P-N Junction (Approx. 30-35%)** • Formation of the P-N Junction and Depletion Region • Barrier Potential and Energy Band Diagram • Junction Biasing (Forward and Reverse) and I-V Characteristics • Depletion Capacitance and Junction Parameters • Analysis and Problem-Solving for Diode Circuits Revision problem and tutorial classes [**4 hrs**.] Quizzes [**1 hr**.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module employs a multi-faceted pedagogical strategy to bridge fundamental physics and practical electronics. The learning journey begins with a conceptual foundation, exploring atomic models and quantum mechanics to establish the core principles governing electron behavior. This theoretical framework is systematically applied to the energy-band theory of solids, enabling students to classify materials and understand semiconductor physics. The strategy heavily emphasizes problem-based learning, requiring students to actively calculate key parameters from carrier densities and Fermi levels to barrier potentials and depletion widths thereby translating abstract concepts into quantitative analysis. This approach ensures that learners not only grasp the operational principles of semiconductor devices like the p-n junction diode but also develop the analytical skills necessary for device characterization and circuit application.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	102	**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**	**2**	**8% (16)**	**4,11**	**LO #1, 4, 6 and 7**
	Assignments	**3**	**4% (12)**	**2 to 13**	**LO #1, 2, 3, 4, 5 and 7**

	Projects	**---**	**----**	**----**	**-----**
	Report	**1**	**7% (7)**	**Continuous**	**All**
	classwork	**1**	**5% (5)**	**13**	**LO #1, 2, 3, 4, 5 and 7**
Summative assessment	**Midterm Exam**	**2 hr.**	**10% (10)**	**12**	**LO # 4-7**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Weeks	Material Covered	Key Contents
Week 1	Introduction to Atomic Models	Thomson's "Plum Pudding," Rutherford's Nuclear Model
Week 2	The Bohr Model	Bohr's Postulates, Electron Energy Levels for Hydrogen
Week 3	Quantum Foundations	De Broglie Hypothesis, Wave-Particle Duality
Week 4	Energy Band Theory	Band Formation, Conductors, Insulators, Semiconductors
Week 5	Fermi-Dirac Statistics	Fermi Function, Fermi Energy, Carrier Distribution
Week 6	Transport Phenomena I	Drift Current, Mobility, Conductivity
Week 7	Transport Phenomena II	Diffusion Current, Einstein Relation, Total Current Density
Week 8	Intrinsic & Extrinsic Semiconductors	Doping, n-type & p-type, Carrier Concentration
Week 9	**Mid-Term Exam** / The p-n Junction I	Depletion Region Formation, Built-in Potential
Week 10	The p-n Junction II	Biasing (Forward/Reverse), I-V Characteristics, Ideal Diode Equation
Week 11	The p-n Junction III	Depletion Capacitance, Junction Breakdown
Week 12	Work Function & Contacts	Electronic Emission Types, Metal-Semiconductor Contacts
Week 13	The Hall Effect	Principle, Hall Voltage & Coefficient, Determining Carrier Density
Week 14	Diode Applications	Rectifiers, Zener Diodes, LEDs, Photodiodes
Week 15	Course Review	Comprehensive Review & Problem-Solving

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Floyd, Thomas L. Electronics Fundamentals: Circuits, Devices and Applications (Floyd Electronics Fundamentals Series). Prentice-Hall, Inc., 2006.	Yes
Recommended Texts	Donald A. Neamen. (2003). "SEMICONDUCTOR PHYSICS AND DEVICES". 3rd Edition, ISBN 0-07-232107-05, USA. (can be downloaded from the Course web page/classroom).	Yes
Websites	Nashelsky, L., & Boylestad, R. L. (2021). Electronic Devices and Circuit Theory Eleventh Edition.	

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 اسم المنهج	**اللغة العربية 1** **Arabic Language 1**			**Module Delivery**	
Module Type نوع المنهج	**Support(داعمة)**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐**Practical** ☒ **Seminar**	
Module Code رمز المنهج	**UOM1011**				
ECTS Credits عدد الوحدات	**2**				
SWL (hr/sem) الحمل الكلي	**50**				
Module Level / المستوى		UGx11 UGI	**Semester of Delivery /** سحب المنهج		1
Administering Department القسم الإداري		Department of Communications and Intelligent Digital Systems Engineering	**College**	Engineering	
Module Leader اسم التدريسي	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title		Asst. Prof.	**Module Leader's Qualification**		Doctor
Module Tutor	هدى رعد شريف		**e-mail** البريد الالكتروني	huda. shareef@uomosul. edu. iq	
Peer Reviewer Name		Asst. Prof. Dr. Saad Ahmed Ayoub	**e-mail**	sa_ah_ay@uomosul.edu.iq	
Scientific Committee Approval Date		1/2/2026	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	الهدف من هذا الفصل الدراسي هو تمكين الطالب من القراءة الصحيحة، وأن يكتسب القدرة على استعمال اللغة استعمالاً صحيحاً في الاتّصال مع الآخرين؛ كالسرعة وجودة الإلقاء وحسن التعبير، وتعويده حسن الاستماع وتنمية الذوق الأدبي لدى الطالب وتعويده على التعبيرات السليمة الواضحة.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**CLO1:** تعريف الطالب بضرورة ممارسة قواعد الكتابة والكلام باللغة العربية الفصيحة. **CLO2:** تعريف الطالب بمستويات نظام اللغة العربية **CLO3:** تعميق اتصال الطالب بالتراث العربي والإسلامي. **CLO4:** تعزيز البحث العلمي في مجال اللغة العربية وعلومها لإعداد الدراسات والبحوث. **CLO5:** إظهار جمال اللغة العربية واتساع معانيها واساليبها الإنشائية. **CLO6:** تمكين الطالب من تجاوز الأخطاء اللغوية وتصحيحها. **CLO7:** تنمية الذوق الأدبي لدى الطالب لإدراك النواحي الجمالية في اسلوب الكلام وصوره ومعانيه. **CLO8:** التعريف بأبرز شعراء العصر العباسي.
Indicative Contents المحتويات الإرشادية	**الجزء الأول:** (6 ساعات) • قواعد اللغة العربية (النحو) • المبتدأ والخبر • نواسخ المبتدأ والخبر **الجزء الثاني:** (6 ساعات) • كان واخواتها • إن واخواتها • ظن واخواتها **الجزء الثالث:** (6 ساعات) • الامتحان الفصلي • الأسماء المنصوبة • المفعول المطلق **الجزء الرابع:** (4 ساعات) • الأخطاء اللغوية • الأملاء **الجزء الخامس:** (8 ساعات) • الادب في العصر العباسي • الشاعر المتنبي • الشاعر أبو تمام • الشاعر أبو فراس الحمداني

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies الاستراتيجيات	إنّ الغاية الأساسية من دروس اللغة العربية هو القضاء على الصعوبة والجمود الذي قد يصاحب مواضيع بعض هذه الدروس، بالإضافة إلى إيصال الأفكار والمعلومات المطلوبة إلى الطلاب بطرق مفهومة وتناسب الفروقات الفردية بينهم، ومن أبرز ما تم التركيز عليه في المحاضرات هو قواعد اللغة العربية والأدب وتتمثل الدراسة بالمحاضرات والامتحانات والواجبات داخل الصف والمناقشة والواجبات المنزلية.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**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 التقويم التكويني	**Quizzes** الكويز	**3**	**5% (15)**	**4,8 and 10**	**All**
	H.W Assignments الواجبات البيتية	**2**	**5% (10)**	**6, 7**	**CLO4, CLO5, and CLO6**
	Seminars السمنار	**1**	**5% (5)**	**12**	**All**
	On-site Assignment واجبات داخل الصف	**2**	**5% (10)**	**6, 10**	**CLO4, CLO5, and CLO6**
Summative Assessment التقويم التلخيصي	**Midterm Exam** امتحان نصف الفصل	**2 hrs**	**10% (10)**	**7**	**All**
	Final Exam الامتحان النهائي	**3 hrs**	**50% (50)**	**16**	**All**
			100% (100 Marks)		

Total Assessment / التقويم النهائي			

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered / المواضيع المغطاة
Week 1	قواعد اللغة العربية (النحو)
Week 2	المبتدأ والخبر
Week 3	نواسخ المبتدأ والخبر
Week 4	كان واخواتها
Week 5	إن واخواتها
Week 6	ظن واخواتها
Week 7	الامتحان الفصلي
Week 8	الأسماء المنصوبة
Week 9	المفعول المطلق
Week 10	الأخطاء اللغوية
Week 11	الأملاء
Week 12	الادب في العصر العباسي
Week 13	الشاعر المتنبي
Week 14	الشاعر أبو تمام
Week 15	الشاعر أبو فراس الحمداني
Week 16	الامتحان النهائي

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered / المواضيع المغطاة
Week 1	لا يوجد
Week 2	لا يوجد
Week 3	لا يوجد
Week 4	لا يوجد
Week 5	لا يوجد
Week 6	لا يوجد
Week 7	لا يوجد

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text الاسم	Available in the Library? هل متوفر في المكتبة؟
Required Texts المنهج المطلوب	النحو الوافي / عباس حسن	نعم
Recommended Texts المنهج الموصى به	في الأدب العباسي / محمد مهدي البصير	نعم
Websites المواقع الالكترونية	https://uomosul.edu.iq/en/engineering/environmental-engineering-dept/	

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	**Mathematics** **الرياضيات**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS112**				
ECTS Credits	**6**				
SWL (hr./sem)	**150**				
Module Level		UG I	**Semester of Delivery**		1
Administering Department		Department of Communications and Intelligent Digital Systems Engineering	**College**	Engineering	
Module Leader	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title		Asst. Prof.	**Module Leader's Qualification**		Doctor
Module Tutor	Dr. Azam Adnan Mohammed		**e-mail**	azam.al-kubaa@uomosul.edu.iq	
Peer Reviewer Name		Asst. Prof. Dr. Saad Ahmed Ayoub	**e-mail**	sa_ah_ay@uomosul.edu.iq	
Scientific Committee Approval Date		1/2/2026	**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	19. Student be able to solve simultaneous liner equations and inequalities involving the square root and modulus function. 20. know addition and double-angle formulas for trigonometric functions and use them to express values of trigonometric functions in the surds form. 21. Student be able to recognize odd, even, periodic, increasing, decreasing functions. 22. understand the operation of composition of functions and the concept of functional inverse. 23. recognize linear, quadratic, power, polynomial, algebraic, rational, trigonometric, exponential, hyperbolic and logarithmic functions and sketch their graphs. 24. be able to calculate limits by substitution and by eliminating zero denominators. 25. know derivatives of power, trigonometric, exponential, hyperbolic, logarithmic and inverse trigonometric functions. 26. know the basic rules of differentiation and use them to find derivatives of products and quotients. 27. know the chain rule and use it to find derivatives of composite functions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completion of this course students will be expected to 21. be able to solve algebraic equations and inequalities involving the square root and modulus function. 22. understand the difference between equations and identities, and be able to prove simple identities and inequalities. 23. know addition and double-angle formulas for trigonometric functions and use them to express values of trigonometric functions in the surds form. 24. be able to recognize odd, even, periodic, increasing, decreasing functions. 25. understand the operation of composition of functions and the concept of functional inverse. 26. to able to recognize linear, quadratic, power, polynomial, algebraic, rational, trigonometric, exponential, hyperbolic and logarithmic functions and sketch their graphs. 27. be able to calculate limits by substitution and by eliminating zero denominators. 28. be able to calculate limits at infinity of rational functions. 29. know derivatives of power, trigonometric, exponential, hyperbolic, logarithmic and inverse trigonometric functions. 30. know the basic rules of differentiation and use them to find derivatives of products and quotients. 31. know the chain rule and use it to find derivatives of composite functions.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A – Algebraic and Complex Numbers** Real Numbers and Their Properties (absolute value, inequalities); Exponents and Radicals; Polynomial and Rational Expressions (simplifying, factoring, and rationalizing); Review of Algebraic Equations (linear and quadratic); Introduction to Cartesian Coordinates. Introduction to Complex Numbers and Vectors: Definition of Complex Numbers; Real and Imaginary Parts; Algebra of Complex Numbers (addition, multiplication, conjugate, modulus); Polar Form and Euler's Formula (optional); Introduction to Vectors in the Plane and 3D Space; Magnitude, Direction, and Operations on Vectors. [8 hrs.]

	Revision problem and tutorial classes [2 hrs.] Quizzes [1 hr.] **Part B - Coordinates and Graphs in the Plane** Directions and Quadrants, Distance between Points, Graphs of Equations, Intercepts and More about Graphing, Slope and Equations for Lines: Slope of Non-vertical Lines, Lines that are Parallel or Perpendicular, Point – Slope Equations, Slope – Intercept Equations, Functions and their Graphs, Domains and Ranges are Often Intervals, Even Functions and Odd Functions, Functions Defined in Pieces, Shifts, Circles, and Parabolas: How to Shift a Graph, Equations for Circles in the Plane, Equations for Parabolas, A Review of Trigonometric Functions: Radian Measure, The Six Basic Trigonometric Functions, Calculating Sines and Cosines, Graphs of Trigonometric Functions, Limits and Continuity: Limits, Examples of Limits, The Sandwich Theorem and $(\sin\theta)/\theta$, Limits Involving Infinity, Continuous Functions.. [14 hrs.] Revision problem and tutorial classes [4 hrs.] Quizzes [2 hr.] **Part C- Derivatives** Slopes, Tangent Lines, and Derivatives, Defining Slopes and Tangent Lines, The Derivative of a function, The Slope of Lines, Differentiation Rules: Integer Powers, Multiples, Sums, and Differences, Second and Higher Order Derivatives, Negative Integer Powers of x, Velocity, Speed, and Other Rate of Change: Velocity, Speed, Acceleration, Derivatives of Trigonometric Functions: The Derivative of the Sine, The Derivative of the Cosine, The Derivative of the Other Basic Functions, The Chain Rule: Integer Powers of Differentiable Functions, Derivative Formulas that Include the Chain Rule, Implicit Differentiation and Fractional Powers: Lenses, Tangents, and Normal Lines, Using Implicit Differentiation to Find Derivatives of Higher Order, Fractional Powers of Differentiable Functions, Linear Approximations and Differentials. [24 hrs.] Revision problem and tutorial classes [6 hrs.] Quizzes [2 hr.]

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 محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem)	87	**Unstructured SWL (h/w)**	6

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

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	8% (16)	4,8,12	LO #2, 5, 8, 9 and 11
	Assignments	3	4% (12)	2 to 12	LO #1, 2, 4, 6 7, and 11
	Projects / Lab.	---	----	----	-----
	Report	1	7% (7)	Continuous	All
	Classwork	1	5% (5)	13	LO #1, 2, 3, 4, 5 and 7
Summative assessment	Midterm Exam	2hr	10% (10)	12	LO # 4-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Algebraic and Analytical Foundations:** Real Numbers and Their Properties (absolute value, inequalities); Exponents and Radicals; Polynomial and Rational Expressions (simplifying, factoring, and rationalizing); Review of Algebraic Equations (linear and quadratic); Introduction to Cartesian Coordinates.
Week 2	**Introduction to Complex Numbers and Vectors:** Definition of Complex Numbers; Real and Imaginary Parts; Algebra of Complex Numbers (addition, multiplication, conjugate, modulus); Polar Form and Euler's Formula (optional); Introduction to Vectors in the Plane and 3D Space; Magnitude, Direction, and Operations on Vectors.
Week 3	**Coordinates and Graphs in the Plane:** Directions and Quadrants, Distance between Points, Graphs of Equations, Intercepts and More about Graphing.
Week 4	**Slope and Equations for Lines:** Slope of Non-vertical Lines, Lines that are Parallel or Perpendicular, Point – Slope Equations, Slope – Intercept Equations.
Week 5	**Functions and their Graphs:** Domains and Ranges are Often Intervals, Even Functions and Odd Functions, Functions Defined in Pieces.
Week 6	**Shifts, Circles, and Parabolas:** How to Shift a Graph, Equations for Circles in the Plane, Equations for Parabolas.

Week 7	**A Review of Trigonometric Functions:** Radian Measure, The Six Basic Trigonometric Functions, Calculating Sines and Cosines, Graphs of Trigonometric Functions.
Week 8	**Limits and Continuity:** Limits, Examples of Limits, The Sandwich Theorem and $(\sin\theta)/\theta$, Limits Involving Infinity, Continuous Functions.
Week 9	**Derivatives:** Slopes, Tangent Lines, and Derivatives, Defining Slopes and Tangent Lines The Derivative of a function, The Slope of Lines.
Week 10	**Differentiation Rules:** Integer Powers, Multiples, Sums, and Differences Second and Higher Order Derivatives, Negative Integer Powers of x.
Week 11	**Velocity, Speed, and Other Rate of Change:** Velocity, Speed, Acceleration
Week 12	**Derivatives of Trigonometric Functions:** The Derivative of the Sine, The Derivative of the Cosine, The Derivative of the Other Basic Functions.
Week 13	**The Chain Rule:** Integer Powers of Differentiable Functions, Derivative Formulas that Include the Chain Rule.
Week 14	**Implicit Differentiation:** Lenses, Tangents, and Normal Lines Using Implicit Differentiation to Find Derivatives of Higher Order.
Week 15	**Fractional Powers:** Fractional Powers of Differentiable Functions, Linear Approximations and Differentials.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Calculus, Thirteenth Edition, by George B. Thomas,	Yes
Recommended Texts	Calculus, Mathematics for Engineers and Technologists, 2002, by Huw Fox and Bill Bolton.	No
Websites	Khan Academy math (https://www.khanacademy.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	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	**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** **التقنيات الرقمية**			**Module Delivery**	
Module Type	**Core (C)**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS 123**				
ECTS Credits	**5**				
SWL (hr./sem)	**125**				
Module Level		UGI	**Semester of Delivery**		2
Administering Department		Department of Communications and Intelligent Digital Systems Engineering	**College**	Engineering	
Module Leader	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title		Assist. Prof.	**Module Leader's Qualification**		Doctor
Module Tutor	Dr. Marwan A. Thnoon		**e-mail**	marwanathy1972@uomosul.edu.iq	
Peer Reviewer Name		Asst. Prof. Dr. Saad Ahmed Ayoub	**e-mail**	sa_ah_ay@uomosul.edu.iq	
Scientific Committee Approval Date		10/03/2026	**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	28. To develop problem solving skills and understanding of Digital circuit theory through the application of techniques. 29. To understand Digital circuit, latches and Flip-flops, asynchronous binary counters, synchronous binary counters. 30. This course deals with the basic concept of latches and Flip-flops, asynchronous binary counters, synchronous binary counters. 31. To construct data storage units/shift registers using flip flops 32. To analyze sequential logic circuits using appropriate tools. 33. To design and analyze synchronous binary, up/down counters.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	32. Recognize how combinational logic circuits works. 33. Design combinational logic circuits using combination logic design process. 34. Define and describe various latches and Flip-flops 35. Construct data storage units/shift registers using flip flops 36. Define asynchronous and synchronous Digital circuit 37. Identify how to design and analyze asynchronous binary counters. 38. Explain how to design and analyze BCD asynchronous counters 39. Explain the Synchronous counters Binary Counters 2: bit, 3-bit. 40. Explain the types of shift registers and Shift register counters Ring Counter.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A - Circuit Components and values** Introduction to Digital Technique, Basic Definitions, System of Numbers, General number formula: Binary, octal, decimal & hexadecimal numbers, Numbers Base Conversion (Arithmetic operation in different numbers complements, binary codes, BCD, Ex-3, gray codes). [9 hrs.] : Revision problem and tutorial classes [6 hrs.] : Quizzes [1 hr.] **Part B- Circuit reduction** Boolean algebra: (Basic definitions, basic theorem & properties, Boolean functions), Canonical & Standard Forms Digital Logic Gates. [12 hrs.]: Revision problem and tutorial classes [8 hrs.]: Quizzes [1 hr.] **Part C- Circuit Theory** Karnaugh Maps (AND & OR implementation, don't care condition), Adders Arithmetic Operation (Sub tractors, half & full adders & Subtractors, binary parallel adders), Code Conversion (Even and odd party logic, decoders, encoders comparator, multiplexers & demultiplexers), Sequential Logic (Flip Flops (RS, T, D, JK…) Master slave FF, Counters, Shift registers).. [24 hrs.]: Revision problem and tutorial classes [16 hrs.]: Quizzes [1 hr.]

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 محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
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**	**6% (12)**	**4,8,11**	**LO #1, 4, 6 and 7**
	Assignments	**3**	**4% (12)**	**2 to 13**	**LO #1, 2, 3, 4, 5 and 7**
	Projects / Lab.	**1**	**25% (10)**	**ALL**	**ALL**
	Classwork	**1**	**6% (6)**	**13**	**LO #1, 2, 3, 4, 5 and 7**
Summative assessment	**Midterm Exam**	**2 hr.**	**(10%) (7.5+2.5 lab)**	**12**	**LO # 4-7**
	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 Digital Technique, General number formula
Week 2	Numbers Base Conversion, Boolean algebra
Week 3	Canonical & Standard Forms Digital Logic Gates, Karnaugh Maps
Week 4	Adders Arithmetic Operation, Code Conversion

Week 5	Introduction to sequential logic circuit design Latches, S-R Latch, gated RS Latch
Week 6	Edge-triggered Flip-Flops, JK-FF and D-FF Flip-Flop Operating Characteristics
Week 7	Shift Register operation
Week 8	Mid-term Exam
Week 9	Types of shift registers, Shift register counters: Ring Counter
Week 10	Models of State Machines
Week 11	Asynchronous Counters: Ripple counter
Week 12	Synchronous counters: Binary Counters 2: bit, 3-bit
Week 13	BCD Counter
Week 14	Up/down counter
Week 15	Synchronous counters design
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Digital Fundamental: By Thomas L. Floyd 11th Edition Pearson Education Limited (2015)	Yes
Recommended Texts	Contemporary Logic Design, Randy Katz Addison Wesley Publishing Company1993	No
Websites	Introduction to Boolean algebra and logic design by Gerhard and Melvin	

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 1** **اللغة الانكليزية 1**			**Module Delivery**	
Module Type	**Support داعمة**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOM1021**				
ECTS Credits	**2**				
SWL (hr./sem)	**50**				
Module Level		UGI	**Semester of Delivery**		2
Administering Department		Department of Communications and Intelligent Digital Systems Engineering	College	Engineering	
Module Leader	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title		Asst. Prof.	**Module Leader's Qualification**		Doctor
Module Tutor	Asst. Prof. Dr. Farhad A. Mahmood		**e-mail**	farhad.m@uomosul.edu.iq	
Peer Reviewer Name		Asst. Prof. Dr. Saad Ahmed Ayoub	**e-mail**	sa_ah_ay@uomosul.edu.iq	
Scientific Committee Approval Date		10/03/2026	**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	34. To develop Communications skills in the English language. 35. To let the students able to read and write in correct Grammer.

	36. To develop the skills of writing professional writing 37. To develop the skills of writing emails for future Engineers
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	41. Learning Parts of Speech in English 42. Learn different tenses of verbs. 43. Learn active and passive voice. 44. Learn adjectives and adverbs. 45. Learn the correct prepositions. 46. Learn the correct articles
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A – learn parts of speech** Nouns, verbs, adjectives, articles, pronouns. [9 hrs.] Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.] **Part B-different tenses** Present simple, present perfect, present continuous, past simple, past perfect, past continuous. [9 hrs.] Revision problem and tutorial classes [6 hrs.] Quizzes [1 hr.] **Part C- active and passive voice** Active and passive voice, since and for [6 hrs.] Revision problem and tutorial classes [6 hrs.] Quizzes [1 hr.]

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 communications skills. This will be achieved through classes, interactive 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	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 التقويم التكويني	**Quizzes** الكويز	**3**	**5% (15)**	**4,8 and 10**	**All**
	H.W Assignments الواجبات البيتية	**2**	**5% (10)**	**6, 7**	**CLO4, CLO5, and CLO6**
	Seminars السمنار	**1**	**5% (5)**	**12**	**All**
	On-site Assignment واجبات داخل الصف	**2**	**5% (10)**	**6, 10**	**CLO4, CLO5, and CLO6**
Summative Assessment التقويم التلخيصي	**Midterm Exam** امتحان نصف الفصل	**2 hrs**	**10% (10)**	**7**	**All**
	Final Exam الامتحان النهائي	**3 hrs**	**50% (50)**	**16**	**All**
Total Assessment / التقويم النهائي			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction
Week 2	Part of speech: Verbs present
Week 3	Part of speech: Verbs past
Week 4	Part of speech: perfect tenses
Week 5	Part of speech: Noun
Week 6	Part of speech: preposition

Week 7	Part of speech: adVerbs
Week 8	Mid-term Exam
Week 9	Part of speech: passive and active
Week 10	Part of speech: since and for
Week 11	Part of speech: articles
Week 12	Part of speech: conjunctions
Week 13	Writing an email
Week 14	Writing an email exercises
Week 15	Technique to fix Grammers.
Week 16	**Preparing week before the Final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	NEW HEADWAY INTERMEDIATE	Yes
Recommended Texts	ENGLISH GRAMMAR IN USE	No
Websites	https://www.udemy.com/course/english-for-engineers/	

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	**Mathematics 1** **الرياضيات 1**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS122**				
ECTS Credits	**6**				
SWL (hr./sem)	**150**				
Module Level		UG I	**Semester of Delivery**		2
Administering Department		Department of Communications and Intelligent Digital Systems Engineering	**College**	Engineering	
Module Leader	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title		Asst. Prof. Dr.	**Module Leader's Qualification**		Doctor
Module Tutor	Dr. Azam Adnan Mohammed		**e-mail**	azam.al-kubaa@uomosul.edu.iq	
Peer Reviewer Name		Asst. Prof. Dr. Saad Ahmed Ayoub	**e-mail**	sa_ah_ay@uomosul.edu.iq	
Scientific Committee Approval Date		10/03/2026	**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.** Provide students with a strong support for basic learning calculus concepts: limits, derivatives, and integration. **2.** Help students communicate mathematical ideas through the practice of proper mathematical notations. **3.** Help students to verify mathematical ideas through the practice of proper mathematical proof techniques. **4.** Developing mathematical thinking and understanding in students by guiding them towards deep thinking rather than "memorizing all the rules". **5.** Increase students' awareness of alternate means of learning such as group study, as well as strategies that will enhance the learning of mathematics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the course, the student will be able to: **1.** How to calculate the area under and between curves. **2.** Interpret a volume of revolution of a function's graph around a given axis as a (Riemann) sum of disks or cylindrical shells, convert to definite integral form and compute its value. **3.** Express the length of a curve as a (Riemann) sum of linear segments, convert to definite integral form and compute its value. **4.** Express the surface area of revolution of a function's graph around a given axis as a (Riemann) sum of rings, convert to definite integral form and compute its value. **5.** Anti-differentiate products of functions by parts. **6.** Recognize and implement appropriate techniques to anti-differentiate products trigonometric functions. **7.** Devise and apply a trigonometric substitution in integrals involving Pythagorean Quotients. **8.** Decompose a rational integrand using partial fractions. **9.** Determine convergence of improper integrals with discontinuities in their domain or infinite limits of integration.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **<u>Definite Integrals</u>** **Areas between Curves**: The Basic Formula, Curves That Cross Boundaries with Changing Formulas, Integrating with Respect to y, Combining Integrals with Formulas from Geometry, **Volumes of Solids of Revolution:** Disc Method, Washer Method, Cylindrical Shells Method, **Lengths of Curves in the Plane:** The Basic Formula, Dealing with Discontinuities in dy/dx, The

	Short Differential Formula, **Area of Surfaces of Revolution:** The Basic Formula, Revolution about the y-axis, The Short Differential Form. [16 hrs.] Revision problem and tutorial classes [4 hrs.] Quizzes [2 hr.] **Techniques of Integration:** **Basic Integration Formulas:** Algebraic Procedures and Trigonometric Identities, **Integration by Parts:** The Formula, Repeated Use, Solving for the Unknown Integral, Tabular Integration, **Trigonometric Integrals:** Products of Sines and Cosines, Eliminating Square Roots, Integrals of Powers of tanx and secx, Integrals of Odd Functions, Definite Integrals of Even Functions, **Trigonometric Substitution:** Trigonometric Substitution for Combining Squares, Integrals involving $ax2+bx+c$,$a\neq0$, Two Useful Formulas, **Rational Functions and Partial Fractions:** General Description of the Method, The Substitution z=tan($x2⁄$). [24 hrs.] Revision problem and tutorial classes [6 hrs.] Quizzes [2 hr.] **Plane Curves and Polar Coordinates**: Polar Coordinates, Definition of Polar Coordinates, Negative Values of r, Changing to Radian Measure, The Use of Radian Measure, Elementary Coordinate, Equations and Inequalities, Cartesian Versus Polar Coordinates, **Graphing in Polar Coordinates:** Symmetry and Slope, Faster Graphing, Finding the Points Where Curves Intersect. [6 hrs.] Revision problem and tutorial classes [2 hrs.] Quizzes [1 hr.]

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 محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4

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	2	8% (16)	4,8,12	LO #2, 5, 8, and 9
	Assignments	3	4% (12)	2 to 12	LO #1, 2, 4, 6, and 9
	Projects / Lab.	---	----	----	-----
	Report	1	7% (7)	Continuous	All
	Classwork	1	5% (5)	13	LO #1, 2, 3, 4, 5 and 7
Summative assessment	Midterm Exam	2hr	10% (10)	12	LO # 4-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Calculus and Area:** Regions Bounded by Curves, Area under the Graph of a Nonnegative Continuous Function.
Week 2	**Definite Integrals:** Constant Functions, Area is Strictly a Special Case.
Week 3	**Indefinite Integrals:** The Indefinite Integral of a Function, Rules of Algebra, The Integrals of $sin2x$ and $cos2x$, Solving Initial Value Problems with Indefinite Integrals.
Week 4	**Integration by Substitution-Running the Chain Rule Backward:** The Generalized Power Rule in Integral Form, Sines and Cosines, The Substitution Method of Integration, Substitution in Definite Integrals.
Week 5	**Application of Definite Integrals: Areas between Curves**: The Basic Formula, derived from Riemann Sums, Curves That Cross Boundaries with Changing Formulas, Integrating with Respect to y, Combining Integrals with Formulas from Geometry.
Week 6	**Volumes of Solids of Revolution:** Disc Method, Washer Method, Cylindrical Shells Method.
Week 7	**Lengths of Curves in the Plane:** The Basic Formula, Dealing with Discontinuities in dy/dx, The Short Differential Formula.
Week 8	**Area of Surfaces of Revolution:** The Basic Formula, Revolution about the y-axis, The Short Differential Form.
Week 9	**Techniques of Integration: Basic Integration Formulas**: Algebraic Procedures and Trigonometric Identities.
Week 10	**Integration by Parts:** The Formula, Repeated Use, Solving for the Unknown Integral, Tabular Integration.
Week 11	**Trigonometric Integrals:** Products of Sines and Cosines, Eliminating Square Roots, Integrals of Powers of tanx and secx, Integrals of Odd Functions, Definite Integrals of Even Functions.

Week 12	**Trigonometric Substitution:** Trigonometric Substitution for Combining Squares, Integrals involving $ax2+bx+c$,$a\neq0$, Two Useful Formulas.
Week 13	**Rational Functions and Partial Fractions:** General Description of the Method, The Substitution $z=\tan(x2/)$.
Week 14	**Plane Curves and Polar Coordinates:** Polar Coordinates, Definition of Polar Coordinates, Negative Values of r, Changing to Radian Measure, The Use of Radian Measure, Elementary Coordinate, Equations and Inequalities, Cartesian Versus Polar Coordinates.
Week 15	**Graphing in Polar Coordinates:** Symmetry and Slope, Faster Graphing, Finding the Points Where Curves Intersect.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Calculus, Thirteenth Edition, by George B. Thomas,	Yes
Recommended Texts	Calculus, Mathematics for Engineers and Technologists, 2002, by Huw Fox and Bill Bolton.	No
Websites	Khan Academy math (https://www.khanacademy.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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Physics 1** **الفيزياء 1**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS 121**				
ECTS Credits	**4**				
SWL (hr./sem)	**100**				
Module Level		UGI	**Semester of Delivery**		2
Administering Department		Department of Communications and Intelligent Digital Systems Engineering	**College**	Engineering	
Module Leader	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title		Assist. Prof.	**Module Leader's Qualification**		Doctor
Module Tutor	Asst. Prof. Dr. Shamil Hamzah Hussein		**e-mail**	Shamil_alnajjar84@uomosul.edu.iq	
Peer Reviewer Name		Asst. Prof. Dr. Saad Ahmed Ayoub	**e-mail**	sa_ah_ay@uomosul.edu.iq	
Scientific Committee Approval Date		10/03/2026	**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	38. Understand the basic operation of semiconductor devices such as diodes and transistors.

أهداف المادة الدراسية	39. Study different diode models (ideal and practical) and how they are used in circuit analysis. 40. Analyze diode applications such as rectifiers, clippers, clampers, and logic circuits. 41. Understand the working principle of rectifier circuits (half-wave and full-wave) for converting AC to DC. 42. Identify different types of diodes and their uses in electronic circuits. 43. Learn the structure and operation of transistors (BJT) including npn and pnp types. 44. Analyze transistor currents, voltages, and biasing methods for amplifier and switching applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	47. Explain the operation of semiconductor devices such as diodes and transistors. 48. Differentiate between types of diodes and transistors and their characteristics. 49. Analyze diode circuits including rectifiers, clippers, and clampers. 50. Explain the structure and operation of BJT transistors. 51. Calculate transistor currents and voltages in basic circuits. 52. Apply biasing techniques for proper transistor operation. 53. Analyze simple electronic circuits used in amplification and switching.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A - Diode Fundamentals and Characteristics:** This part introduces the basic concept of semiconductor diodes, including their structure, operation, and electrical characteristics. It explains ideal and practical diode models and discusses important parameters such as forward voltage and current flow. Students learn how diodes behave under forward and reverse bias conditions. [**8 hrs**.] Revision problem and tutorial classes [**4 hrs**.] Quizzes [**1 hr**.] **Part B- Diode Applications in Electronic Circuits:** This section focuses on practical uses of diodes in circuits. It covers rectifier circuits (half-wave and full-wave), clipping and clamping circuits, and basic diode logic gates. The aim is to show how diodes are used to convert AC to DC and to control voltage levels in electronic systems. [**8 hrs**.] Revision problem and tutorial classes [**4 hrs**.] Quizzes [**1 hr**.] **Part C- Transistor Fundamentals and Circuit Analysis:** This part introduces the bipolar junction transistor (BJT), including its structure (emitter, base, collector) and types (npn and pnp). It explains transistor operation, current relationships, and biasing methods. Students also learn how to analyze transistor circuits and calculate currents and voltages for amplifier and switching applications. [**6 hrs**.] Revision problem and tutorial classes [**3 hrs**.] Quizzes [**1 hr**.]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The module is delivered through a combination of lectures, problem-solving sessions, and practical examples to help students understand semiconductor devices and electronic circuits. Lectures introduce the theoretical concepts, while tutorials and class exercises allow students to practice circuit analysis and calculations. Visual diagrams, circuit simulations, and discussion are used to improve understanding, and students are encouraged to participate actively and solve numerical problems to reinforce their learning.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	22	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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**	**6% (12)**	**4,8,11**	**LO #1, 4, 6 and 7**
	Assignments	**3**	**4% (12)**	**2 to 13**	**LO #1, 2, 3, 4, 5 and 7**
	Projects / Lab.	**1**	**25% (10)**	**ALL**	**ALL**
	Classwork	**1**	**6% (6)**	**13**	**LO #1, 2, 3, 4, 5 and 7**
Summative assessment	**Midterm Exam**	**2 hr.**	**(10%) (7.5+2.5 lab)**	**12**	**LO # 4-7**
	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 semiconductor materials and basic electronic devices.
Week 2	PN junction diode structure and operation.
Week 3	Diode characteristics and diode models (ideal and practical).
Week 4	Diode circuits and basic analysis methods.
Week 5	Rectifier circuits (half-wave rectifier).
Week 6	Full-wave rectifier and rectifier applications.
Week 7	Diode clipping circuits and applications.
Week 8	Diode clamping circuits and diode logic gates.
Week 9	Introduction to transistors and types of transistors.
Week 10	Bipolar Junction Transistor (BJT) structure and operation.
Week 11	Transistor current relationships and parameters (α and β).
Week 12	Transistor biasing and basic transistor circuits.
Week 13	Analysis of transistor currents and voltages in circuits.

Week 14	Applications of transistors in amplification and switching.
Week 15	Review of the course and problem-solving session.
Week 16	Diode characteristics and diode models (ideal and practical).

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Floyd, Thomas L. Electronics Fundamentals: Circuits, Devices and Applications (Floyd Electronics Fundamentals Series). Prentice-Hall, Inc., 2006.	Yes
Recommended Texts	Donald A. Neamen. (2003). "SEMICONDUCTOR PHYSICS AND DEVICES". 3rd Edition, ISBN 0-07-232107-05, USA. (can be downloaded from the Course web page/classroom).	Yes
Websites	Nashelsky, L., & Boylestad, R. L. (2021). Electronic Devices and Circuit Theory Eleventh Edition.	

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	**Principles of Artificial Intelligent** **اساسيات الذكاء الاصطناعي**			**Module Delivery**	
Module Type	**Basic** اساسية			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS125**				
ECTS Credits	4				
SWL (hr./sem)	**100**				
Module Level		UG I	**Semester of Delivery**		2
Administering Department		Department of Communications and Intelligent Digital Systems Engineering	**College**	Engineering	
Module Leader	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title		Asst. Prof.	**Module Leader's Qualification**		Doctor
Module Tutor	Dr. Yazen S. Sheet يزن صبحي شيت		**e-mail**	Yazenalnuaimi@uomosul.edu.iq	
Peer Reviewer Name		Asst. Prof. Dr. Saad Ahmed Ayoub	**e-mail**	sa_ah_ay@uomosul.edu.iq	
Scientific Committee Approval Date		10/03/2026	**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	Introduce the student to general artificial intelligence fundamentals. Specifically, the course aims to: 1- Introduce students to the basic concepts and terminology of Artificial Intelligence. 2- Develop an understanding of how intelligent systems perceive, reason, and learn. 3- Familiarize students with classical AI techniques such as search, logic, and knowledge representation. 4- Highlight the role of AI in communications and intelligent digital systems engineering. 5- Encourage ethical awareness and responsible use of AI technologies.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completion of this course students will be expected to: 1. To define Artificial Intelligence and its major subfields. 2. To describe intelligent agents and their operating environments. 3. To explain basic problem-solving and search strategies in AI. 4. To identify key machine learning paradigms and neural network concepts. 5. To analyze simple problems and represent them using AI concepts. 6. To apply logical reasoning to basic decision-making scenarios. 7. To relate AI principles to real-world engineering applications. 8. To recognize ethical, social, and safety considerations in AI systems. 9. To appreciate the future impact of AI on engineering and society.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **Part A – Foundations of Artificial Intelligence and Problem Solving** Definition and scope of Artificial Intelligence, Historical development and evolution of AI, Strong AI vs Weak AI, AI applications in modern engineering and daily life, Concept and characteristics of intelligent agents, Agent architecture and functionality, Types of intelligent agents, Philosophical and scientific foundations, AI as a problem-solving discipline, Problem formulation and representation [16 hrs.] Revision problem and tutorial classes [4 hrs.] Quizzes [1 hr.] **Part B – Uninformed and Informed Search Techniques** Breadth-First Search (BFS), Depth-First Search (DFS), Uniform Cost Search, Advantages, limitations, and performance comparison, Heuristic functions and evaluation strategies, Greedy Best-First Search, Engineering and navigation applications, Role of knowledge in intelligent systems, Semantic networks, Fundamentals of propositional logic, Logical operators and truth tables, Inference and rule-based reasoning systems, Logical decision-making in AI [10 hrs.] Revision problem and tutorial classes [3 hrs.] Quizzes [1 hr.]

	Part C – Machine Learning, AI Applications, and Artificial Intelligence Definition and importance of machine learning**,** Relationship between AI, Machine Learning, and Deep Learning**,** learning from data and pattern recognition**,** Supervised learning concepts**,** Unsupervised learning concepts**,** Reinforcement learning fundamentals**,** Engineering and communication system applications, Basic structure of feedforward neural networks, AI in wireless and adaptive communication systems, Intelligent routing and network optimization, AI applications in IoT and smart sensing systems, AI-based signal processing and data analysis, Ethical challenges in AI development, Bias, fairness, and transparency, Safety and security considerations, Future trends and societal impacts of AI [9 hrs.] Revision problem and tutorial classes [3 hrs.] Quizzes [1 hr.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures 2. Tutorials and Problem-Solving Sessions 3. Case Study-Based Learning 4. Student Presentations and Collaborative Learning 5. Independent and Self-Directed Learning 6. Technology-Enhanced Learning 7. Formative Feedback

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
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	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
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**
	Quizzes	**2**	**8% (16)**	**4,8,11**	**LO #1, 4, 6 and 7**

Formative assessment	**Assignments**	**3**	**4% (12)**	**2 to 13**	**LO #1, 2, 3, 4, 5 and 7**
	Projects	**---**	**----**	**----**	**-----**
	Report	**1**	**7% (7)**	**Continuous**	**All**
	classwork	**1**	**5% (5)**	**13**	**LO #1, 2, 3, 4, 5 and 7**
Summative assessment	**Midterm Exam**	**2 hr.**	**10% (10)**	**12**	**LO # 4-7**
	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 Artificial Intelligence**
Week 2	**Intelligent Agents and Environments**
Week 3	**Foundations of Artificial Intelligence**
Week 4	**Problem Solving and State Space Representation**
Week 5	**Uninformed Search Techniques**
Week 6	**Informed Search and Heuristic Methods**
Week 7	**Knowledge Representation Methods**
Week 8	**Logic and Reasoning in AI**
Week 9	**Midterm Examination**
Week 10	**Introduction to Machine Learning**
Week 11	**Types of Machine Learning**
Week 12	**Neural Networks (Conceptual Overview)**
Week 13	**AI Applications in Communications and Digital Systems**
Week 14	**Ethics, Safety, and Future Trends in AI**
Week 15	**Review and Student Presentations**
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Stuart J. Russell and Peter Norvig" Artificial Intelligence, A Modern Approach", 4th edition, 2022	Yes
Recommended Texts	David L. Poole and Alan K. Mackworth " Artificial Intelligence: Foundations of Computational Agents, 3rd Edition ", 2023	Yes

Websites	https://thecareergram.com/50-free-websites-to-learn-ai-skills-in-2026/
	https://learnartificialintelligence.ai/?utm_source=chatgpt.com

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	**Probability and statistics** **الاحتمالية والاحصاء**			**Module Delivery**	
Module Type	**Support داعمة**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS126**				
ECTS Credits	**4**				
SWL (hr./sem)	**100**				
Module Level		UG I	**Semester of Delivery**		2
Administering Department		Department of Communications and Intelligent Digital Systems Engineering	**College**	Engineering	
Module Leader	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title		Asst. Prof.	**Module Leader's Qualification**		Doctor
Module Tutor	Asst. Prof. Dr. Saad Ahmed Ayoub		**e-mail**	sa_ah_ay@uomosul.edu.iq	
Peer Reviewer Name		Asst. Prof. Dr. Farhad E. Mahmood	**e-mail**	Farhad.m@uomosul.edu.iq	
Scientific Committee Approval Date		**10/03/2026**	**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	The primary aim of this module is to provide engineering students with the theoretical foundation and practical skills required to analyze data and model uncertainty in engineering systems. Specifically, the course aims to: 45. Develop data analysis skills, enable students to collect, organize, visualize, and summarize engineering data using descriptive statistical measures (Mean, Variance, Histograms). 46. Model uncertainty, introduce the concepts of probability theory, random variables, and probability distributions (Discrete & Continuous) to model random phenomena such as noise in communication channels and component failures. 47. Understand theoretical distributions, familiarize students with standard probability distributions (Normal, Exponential, Binomial, Poisson) and their applications in signal processing and reliability engineering. 48. Apply statistical inference, teach students how to draw conclusions about a population based on sample data through estimation techniques (Confidence Intervals) and hypothesis testing. 49. Engineering application, bridge the gap between mathematical theory and practical engineering problems by applying statistical methods to quality control, error analysis, and system performance evaluation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completion of this course students will be expected to: 10. be able to distinguish between different types of data (nominal, ordinal, discrete, continuous) and summarize them using frequency tables and graphical representations like histograms and polygons. 11. be able to calculate and interpret measures of central tendency (mean, median, mode) and measures of dispersion (variance, standard deviation, coefficient of variation) for grouped and ungrouped data. 12. know the fundamental axioms of probability and counting techniques (multiplication rule, permutations, combinations) to solve problems involving mutually exclusive and independent events. 13. understand the concept of conditional probability and be able to apply Bayes' Theorem to solve complex probability problems related to engineering systems reliability. 14. be able to differentiate between discrete and continuous random variables, and construct Probability Mass Functions (PMF) and Probability Density Functions (PDF). 15. be able to calculate the mathematical expectation (mean) and variance for various random variables using summation (for discrete) and integration (for continuous). 16. know the properties and formulas of special discrete distributions (Binomial, Poisson) and continuous distributions (Uniform, Normal/Gaussian, Exponential) and apply them to model communication errors and signal noise. 17. be able to use the Standard Normal (Z) table to transform and calculate probabilities for normally distributed random variables. 18. understand joint probability distributions for two variables, and be able to calculate marginal distributions, covariance, and correlation coefficients to analyze the relationship between variables. 19. know the Central Limit Theorem and understand its role in sampling distributions and statistical approximation.

	20. be able to estimate population parameters by calculating Point Estimates and constructing Confidence Intervals for means. 21. be able to perform Hypothesis Testing for means and proportions, including formulating Null and Alternative hypotheses, determining critical regions, and identifying Type I and Type II errors.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **Part A – Descriptive Statistics and Probability Theory** Introduction to Statistics and Data Analysis: Populations, Samples, and Types of Variables (Discrete, Continuous, Nominal, Ordinal); Descriptive Statistics: Frequency Distributions and Sturges' Rule, Graphical Presentation of Data (Histograms, Frequency Polygons, Ogives); Measures of Central Tendency (Mean, Median, Mode); Measures of Dispersion (Range, Variance, Standard Deviation, Coefficient of Variation); Counting Techniques: The Multiplication Rule, Permutations, and Combinations; Probability Theory: Sample Space and Events, Axioms of Probability, Additive Rules, Conditional Probability, Independence, and Bayes' Theorem. [16 hrs.] Revision problem and tutorial classes [4 hrs.] Quizzes [1 hr.] **Part B – Random Variables and Probability Distributions** Random Variables: Concept of Discrete and Continuous Random Variables; Probability Functions: Probability Mass Functions (PMF) for discrete variables and Probability Density Functions (PDF) for continuous variables; Cumulative Distribution Functions (CDF); Mathematical Expectation: Mean and Variance of a Random Variable; Special Discrete Distributions: Bernoulli Trials, The Binomial Distribution (definition, mean, variance), The Poisson Distribution (modeling rare events, rates); Special Continuous Distributions: The Continuous Uniform Distribution, The Normal (Gaussian) Distribution (properties, standard normal Z-transform, applications in noise analysis), The Exponential Distribution and Memoryless Property. [10 hrs.] Revision problem and tutorial classes [3 hrs.] Quizzes [1 hr.] **Part C – Joint Distributions and Statistical Inference** Joint Probability Distributions: Joint PMF and PDF for two variables, Marginal Distributions, Statistical Independence, Covariance and Correlation; Sampling Distributions: Random Sampling, The Central Limit Theorem (CLT) and its applications; Statistical Estimation: Point Estimation vs. Interval Estimation, Confidence Intervals for the Mean (known and unknown variance); Hypothesis Testing: Null and Alternative Hypotheses, Type I and Type II Errors, Significance Levels, One-tailed and Two-tailed tests, Hypothesis tests concerning Single Means and Proportions. [9 hrs.] Revision problem and tutorial classes [3 hrs.] Quizzes [1 hr.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' active participation in bridging the gap between theoretical probability and practical data analysis, while at the same time refining and expanding their critical thinking skills regarding decision-making

	under uncertainty. This will be achieved through classes, interactive problem-solving tutorials, and by considering real-world engineering case studies—such as signal noise modeling and quality control—that demonstrate the practical value of statistics to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
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	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
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**	**8% (16)**	**4,8,11**	**LO #1, 4, 6 and 7**
	Assignments	**3**	**4% (12)**	**2 to 13**	**LO #1, 2, 3, 4, 5 and 7**
	Projects	**---**	**----**	**----**	**-----**
	Report	**1**	**7% (7)**	**Continuous**	**All**
	classwork	**1**	**5% (5)**	**13**	**LO #1, 2, 3, 4, 5 and 7**
Summative assessment	**Midterm Exam**	**2 hr.**	**10% (10)**	**12**	**LO # 4-7**
	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 Statistics and Data:** Definition of Statistics (Descriptive vs Inferential); Population vs. Sample; Types of Variables (Categorical, Numerical, Discrete, Continuous); Scales of Measurement (Nominal, Ordinal).
Week 2	**Descriptive Statistics (Visualization):** Organization of Data; Frequency Distributions and Sturges' Rule; Graphical Presentations: Histograms, Frequency Polygons, and Ogives (Cumulative Frequency Curves).

Week 3	**Measures of Central Tendency:** The Arithmetic Mean; The Median; The Mode; Relationship between Mean, Median, and Mode; Skewness (Positive and Negative).
Week 4	**Measures of Dispersion:** Range; Variance (Population vs Sample); Standard Deviation; Coefficient of Variation (C.V) for comparing variability; Quartiles and Percentiles.
Week 5	**Counting Techniques:** The Fundamental Counting Principle (Multiplication Rule); Permutations (Order matters); Combinations (Order doesn't matter); Applications in arrangements.
Week 6	**Fundamentals of Probability:** Sample Space and Events; Mutually Exclusive Events; Axioms of Probability; Addition Rules; Complementary Events (P(A') = 1 - P(A)).
Week 7	**Conditional Probability and Bayes:** Conditional Probability definition; Independent Events; The Multiplication Rule; Total Probability Theorem; Bayes' Theorem (Reversing conditional probabilities).
Week 8	**Midterm Examination:** Comprehensive review of Descriptive Statistics and Probability Theory followed by the Midterm Exam.
Week 9	**Discrete Random Variables:** Definition of Random Variables; Probability Mass Function (PMF); Cumulative Distribution Function (CDF) for discrete variables; Mathematical Expectation (Mean) and Variance.
Week 10	**Continuous Random Variables:** Probability Density Function (PDF); Area under the curve; CDF for continuous variables; Mean and Variance calculation using integration.
Week 11	**Special Discrete Distributions:** Bernoulli Trials; The Binomial Distribution (Parameters, Mean, Variance); The Poisson Distribution (Modeling rare events/rates.
Week 12	**Special Continuous Distributions:** The Uniform Distribution; The Normal (Gaussian) Distribution (Properties, Standard Normal Z-scores); The Exponential Distribution.
Week 13	**Joint Distributions:** Joint PMF and Joint PDF; Marginal Distributions; Conditional Distributions; Statistical Independence; Covariance and Correlation.
Week 14	**Sampling and Estimation:** Random Sampling; The Central Limit Theorem (CLT); Point Estimation; Confidence Intervals for the Mean (Large samples).
Week 15	**Hypothesis Testing:** Null and Alternative Hypotheses (H_0, H_1); Type I and Type II Errors; Level of Significance; Critical Regions; Tests concerning Single Means and Proportions.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Ross, S. M. "Introduction to Probability and Statistics", 2014	Yes
Recommended Texts	Devore, J. L. "Probability and Statistics for Engineering and the Sciences", 2012	Yes
Websites	https://www.scribd.com/document/974239731/Probability-and-Statistics-r20a0024-1	

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	**C Language Programming** **البرمجة بلغة سي**			**Module Delivery**	
Module Type	Support or related learning activity			☐ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CS124**				
ECTS Credits	5.0				
SWL (hr./sem)	**125**				
Module Level	UG I		**Semester of Delivery**	2	
Administering Department	Department of Communications and Intelligent Digital Systems Engineering		**College**	Engineering	
Module Leader	Asst. Prof. Dr. Mohammad T. Yaseen		**e-mail**	mtyaseen@uomosul.edu.iq	
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	Doctor	
Module Tutor	Dr. Yazen Subhi Sheet, Karam A. Abdulghani		**e-mail**	yazenalnuaimi@uomosul.edu.iq, karam.anan@uomosul.edu.iq	
Peer Reviewer Name	Asst. Prof. Dr. Saad Ahmed Ayoub		**e-mail**	sa_ah_ay@uomosul.edu.iq	
Scientific Committee Approval Date	1/4/2026		**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	**This module aims to:**

أهداف المادة الدراسية	1. Introduce students to the fundamental concepts of computer programming using the C programming language. 2. Develop students' problem-solving skills through the use of algorithms and flowcharts. 3. Provide students with the ability to design, write, compile, and debug basic C programs. 4. Enable students to use fundamental programming constructs such as variables, data types, operators, and expressions. 5. Develop students' understanding of control structures including selection and repetition statements. 6. Introduce the concept of modular programming through the use of functions. 7. Provide students with knowledge of arrays and basic data organization techniques. 8. Introduce the basic concepts of pointers and structures for managing and organizing data in programs. 9. Prepare students for more advanced courses in programming and data structures.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this module, students will be able to: 1. Explain the fundamental concepts of programming and the structure of C programs. 2. Analyze computational problems and design appropriate algorithms and flowcharts. 3. Implement C programs using variables, data types, constants, and operators. 4. Apply decision-making structures such as **if, if-else, and switch statements**. 5. Implement iterative structures, including **for, while, and do-while loops**. 6. Design and implement functions using **pass-by-value** and **return** techniques. 7. Develop programs that utilize **one-dimensional and two-dimensional arrays**. 8. Demonstrate an understanding of **pointers and memory addressing**. 9. Use **structures (struct)** to organize and manage related data. 10. Develop simple C programs to solve engineering and computational problems.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** □ Introduction to programming concepts and overview of data structures. □ Problem-solving techniques including algorithms, flowcharts, and program design.

	□ Basic elements of C including program structure, declarations, comments, variables, data types, and constants. □ Standard input and output operations. □ Expressions, operators, and operator precedence rules. □ Selection statements including **if, if-else, and switch**. □ Repetition statements including **for, while, and do-while**. □ Functions in C including **Definition and Pass by Value**. □ Arrays including **one-dimensional and two-dimensional arrays**. □ Basics of **pointers** and memory addressing. □ **Structures (struct)** and their applications in organizing data.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The following learning and teaching strategies are used in this module: 8. **Lectures:** Deliver theoretical knowledge of programming concepts, C syntax, and fundamental programming structures. 9. **Practical Examples and Demonstrations:** Explain programming concepts through sample programs and live coding demonstrations. 10. **Problem-Solving Sessions:** Encourage students to analyze problems and design algorithms and flowcharts. 11. **Programming Exercises:** Provide students with programming tasks to enhance coding skills and understanding. 12. **Interactive Discussions:** Promote student participation in understanding programming logic and debugging techniques. 13. **Laboratory Practice:** Enable students to apply theoretical knowledge by writing and executing C programs.

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

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
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**	**2**	**6% (12)**	**4,8,11**	**LO #1, 4, 6 and 7**
	Assignments	**2**	**2% (4)**	**2 to 13**	**LO #1, 2, 3, 4, 5 and 7**
	Projects/LAB	**---**	**50% (20)**	**Continuous**	**all**
	Report	**---**	**----**	**----**	**-----**
	classwork	**1**	**4% (4)**	**13**	**LO #1, 2, 3, 4, 5 and 7**
Summative assessment	**Midterm Exam**	**2 hr.**	**10% (10)**	**12**	**LO # 4-7**
	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 Programming Concepts & Overview of Data Structures**
Week 2	**Problem Solving Techniques: Algorithms, Flowcharts & Program Design**
Week 3	**Basic Elements of C Program Structure, Declarations & Comments**
Week 4	**Variables, Data Types & Constants**
Week 5	**Standard Input and Output Operations**
Week 6	**Expressions, Operators & Operator Precedence**
Week 7	**Selection Statements: if, if-else, switch**
Week 8	**Repetition Statements: for, while, do-while**
Week 9	**Functions: Definition and Pass by Value**
Week 10	**Arrays: One-Dimensional Arrays**
Week 11	**Arrays: Two-Dimensional Arrays**
Week 12	**Strings: Definition and Operations**
Week 13	**Basics of Pointers**
Week 14	**Structures (struct)**

Week 15	**Preparatory Week before the Final Examination**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	*أساسيات وتطبيقات لغة سي , د. عمر زرتي , جامعة طرابلس , 2006* C Programming Language, 2nd Edition 2nd Edition by Brian W. Kernighan , Dennis M. Ritchie	Yes
Recommended Texts	C Programming The ultimate way to learn the fundamentals of the C language by Harry H. Chaudhary, Published By First MIT-CreateSpace Inc. O-D-Publishing, LLC USA, 2014	Yes

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.