

**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

2026

Introduction:

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

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

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

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

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



Faculty / Institute: College of science

Scientific department: Mathematics and computer applications

Academic or professional name: B.Sc.s. in Mathematics and computer applications

Final certificate name: B.Sc.s. in Mathematics and computer applications

Academic system: Bologna

Description preparation date: 9-2-2026

Signature :

Head of department:

Dr.Aws Nidhal Dheyab

Date : 10/2/2026



Signature

Dean's assistance for scientific affairs:

Dr.Sala Abdul-Khudhar Hassan

Date : 10/2/2026



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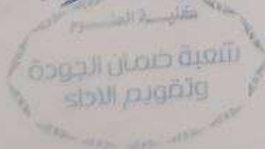
Department of quality assurance and university performance

Director quality assurance and university performance

M.Sc Salih A. Lazam

Date

10/2/2026



Dean's approval

1. Program Vision

The department aspires to be a leader in providing innovative education that integrates theory and practice, while striving to achieve academic and research excellence in mathematics and information technology, to prepare graduates capable of competing in the labor market and contributing to sustainable development.

2. Program Mission

The department's mission is to provide high-quality education in the fields of mathematics and its applications, with the aim of preparing scientifically and practically qualified graduates by providing an educational environment that stimulates learning and creativity.

3. Program Objectives

The Department of Mathematics and Computer Applications aims to provide high-quality education that is consistent with recent developments in mathematics and information technology, with a focus on preparing a generation of academically and practically distinguished graduates capable of meeting academic and professional challenges. The department also seeks to promote scientific research and partnerships with the community and industry. To achieve these goals, the department works to achieve the following objectives:

1. Providing high-quality education: Offering distinguished academic programs that meet the needs of the labor market and enhance students' ability to solve complex problems in mathematics and computer applications. Efforts are made to instill a love of the specialty in students by highlighting the importance of mathematics and its applications in all scientific fields.
2. Preparing outstanding students for graduate studies: Preparing outstanding students as a first step toward completing their graduate studies to obtain master's

and doctoral degrees, in response to the community's need for this rare specialization.

3. Qualifying specialized personnel for the labor market: Preparing qualified personnel to work in various government institutions in the fields of mathematics, computers, operations research, and statistics. Graduates are also qualified to work as research assistants in mathematics and computer science departments at universities, a demand for them in secondary education.

4. Promoting Scientific Research: Encouraging faculty members and students to conduct innovative scientific research in pure and applied mathematics, and publishing the results of this research in prestigious scientific journals.

5. Developing Applied Skills: Enhancing students' practical skills through applied graduation projects and training programs, enabling them to effectively contribute to the application of mathematics in information technology and industry.

6. Building Partnerships with Community and Industry: Encouraging cooperation with the local community and industry by providing mathematical and technical solutions that contribute to improving quality of life and supporting sustainable development.

7. Stimulating Professional Development: Encouraging faculty members to enhance their academic and research level and work towards obtaining prestigious academic titles.

8. Establishing Graduate Programs: Working to develop the department to enable it to offer advanced graduate programs in mathematics and its applications, to meet the needs of the academic and professional community.

9. Improving the learning environment: Creating a stimulating learning environment based on innovation and interaction, enhancing the learning experience and preparing students for academic and professional excellence.

10. Developing critical and creative thinking skills: Training students to develop critical and creative thinking skills, while enhancing their ability to innovate in solving mathematical and technical problems.

4. Program Accreditation

Does the program have program accreditation? And from which agency?

Not accreditation yet

5. Other external influences

Ministry of higher education and scientific research

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	8	12	12%	
College Requirements	11	27	15–20%	
Department Requirements	34	106	63–68%	
Summer Training		pass		
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
The first	Math1101	Calculus I	#	
The first	Math1102	Foundations of Mathematics I	#	
The first	Math1103	Finite Mathematics	#	
The first	COS1101	General Mechanic	#	#
The first	UOM1101	Human Rights and Democracy	#	
The first	UOM1102	Computer I	#	#
The first	Math1214	CalculusII	#	

The first	Math1215	Foundations of Mathematics II	#	
The first	COS1202	Pascal Programming	#	#
The first	UOM1203	English Language I	#	
The first	COS1203	Electeical Physics	#	#
The first	COS1204	Logic Design for Computer	#	
the second	Math2318	Advance Calculus I	#	
the second	Math 2319	Ordinary Differential EquationsI	#	
the second	Math23010	Group Theory	#	
the second	Math 23111	Linear Algebra	#	
the second	COS2305	Programming C++	#	#
the second	UOM2314	Computer II	#	
the second	Math 24114	Advance Calculus II	#	
the second	UOM2405	Ordinary Differential EquationsII	#	
the second	Math 24016	Arabic Language	#	
the second	COS2406	Probability and statistics	#	
the second	COS2407	Matlab	#	#
Third	Math35118	Mathematical Analysis I	#	
Third	Math35119	Numerical Analysis I	#	#
Third	Math35120	Ring Theory I	#	
Third	Math35121	Partial Differential Equations	#	
Third	Math35122	Mathematical StatisticsI	#	
Third	COS3518	Visual Basic	#	#
Third	Math36123	Mathematical Analysis II	#	
Third	Math36124	Numerical Analysis II	#	#
Third	Math36125	Ring Theory II	#	
Third	Math36126	Mathematical Statistics II	#	
Third	Math36027	Algorithms	#	
Third	UOM3616	English Language II	#	
Fourth	Math 47128	Topology I	#	
Fourth	Math47129	Complex Analysis I	#	
Fourth	Math47130	Functional Analysis	#	
Fourth	Math47031	Encryption	#	
Fourth	Math47132	Artificial Intelegant	#	
Fourth	UOM4707	Professional Ethics	#	
Fourth	Math48133	Topology II	#	

Fourth	Math 48134	Complex Analysis II	#	
Fourth	Math48135	Dynamical Systems II	#	
Fourth	Math48036	Operations Research	#	
Fourth	Math48137	Approximation Theory	#	
Fourth	Math48038	Graduation Project	#	

8. Expected learning outcomes of the program

Knowledge & Understanding	
Upon successful completion of the program, graduates will be able to:	• Comprehend Core Mathematical Theories: Understand and interpret the fundamental principles of pure and applied mathematics (such as algebra, mathematical analysis, probability and statistics, and differential equations). • Understand Computer Science Fundamentals: Grasp the structural concepts of computer science, including algorithms, data structures, and databases. • Bridge Mathematics and Programming: Understand how to translate mathematical models and equations into executable programming algorithms. • Data Security and Cryptography: Comprehend the mathematical foundations of cryptography, network security, and data protection.
Cognitive (Intellectual) Skills	
These are the thinking, analytical, and problem-solving skills graduates will develop:	• Mathematical Proof & Analysis: Ability to think logically, construct sound mathematical proofs, and deconstruct complex problems into manageable parts. • Mathematical Modeling: Ability to formulate real-world problems (in economics, physics, engineering, or biology) into mathematical models to solve them computationally. • Algorithmic Analysis: Evaluate the efficiency of algorithms in terms of time and space complexity to select the optimal solution for programming problems. • Critical Thinking & Problem Solving: Ability to analyze big data, extract statistical patterns, and make data-driven decisions.
Practical & Professional Skills	
These skills ensure graduates are ready for the workforce:	• Proficiency in Programming Languages: Ability to write and develop code using modern languages strong in mathematics and statistics (such as Python, R, MATLAB, and

	C++). • Software Design & Development: Apply mathematical and numerical methods to solve complex problems that do not have direct analytical solutions. • Use of Specialized Software: Efficiently use and develop software for simulation, statistical analysis, and database management. • Artificial Intelligence Applications: Apply mathematical algorithms in machine learning and deep learning, which rely heavily on linear algebra, probability, and calculus.
General & Transferable Skills	
Supporting skills that enhance graduate efficiency in any work environment:	• Teamwork: Ability to work effectively within multidisciplinary teams (such as software development or operations research teams). • Effective Communication: Explain complex mathematical and technical concepts clearly to non-specialists. • Continuous Self-Learning: Ability to independently keep pace with rapid advancements in computer technology and programming languages.

9. Teaching and Learning Strategies

Theoretical applied lectures, scientific seminars, laboratory applications, in addition to the training courses held by the department

10. Evaluation methods

Through weekly and quarterly examinations, in addition to scientific reports.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Assistant lecture	Mathematics and computers	Types of specializations			#	
lecturer	Mathematics and computers	Types of specializations			#	
Assistant Professor	Mathematics and computers	Types of specializations			#	
Professor	Mathematics and computers	Types of specializations			#	

Professional Development

Mentoring new faculty members

Personal development is planned by involving them in committees and also by examining modern scientific sources, in addition to participating in training courses inside and outside the country in the field of scientific specialization.

Professional development of faculty members

Personal development is planned through reviewing modern scientific sources, in addition to participating in training courses inside and outside the country in the field of scientific specialization.

12. Acceptance Criterion

central

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Development is planned by reviewing modern scientific sources in the field of scientific specialization.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

المرحلة الاولى

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Calculus I</u>		Module Delivery
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>Math1101</u>		
ECTS Credits	<u>7</u>		
SWL (hr/sem)	<u>175</u>		
Module Level	1	Semester of Delivery	1
Administering Department	Mathematics	College	Science
Module Leader	Malik saad	e-mail	Maliksaad@mu.edu.iq
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	Maliksaad@mu.edu.iq
Peer Reviewer Name	Name	e-mail	Maliksaad@mu.edu.iq
Scientific Committee Approval Date	01/10/2024	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Students learn the concept of functions and their partial derivatives and their applications and repeated integrals and their applications 2. This course deals with the basic concept of calculus I. 3. This is the basic subject for all functions with types.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Define Limits and Continuity: State the rigorous and intuitive definitions of a limit, and explain the conditions required for a function to be continuous at a point. • Explain the Concept of a Derivative: Define the derivative as both the limit of a difference quotient (the slope of a tangent line) and as an instantaneous rate of change. • Understand Derivative Rules: Identify and explain foundational differentiation rules, including the Product, Quotient, and Chain Rules. • State the Fundamental Theorem of Calculus (FTC): Describe how differentiation and integration are inverse operations, and explain how the theorem connects definite integrals with antiderivatives.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • معدل التغير في الدالة (The Rate of Change of Function) • ميل قطعة المستقيم (Slope of the straight line)، الإحداثيات (Coordinates)، معادلات القطعة المستقيمة (Equations of straight lines)، الزيادات والمسافة (Distance) • المتباينات (Inequalities)، الفترات (Intervals)، القيمة المطلقة (Absolute value) • الدوال والرسوم البيانية (Functions and graphs)، المجال المقابل (Codomain)، المجال (Domain)، نقاط التقاطع مع المحاور (Axes intercept points)، التناظر (Symmetry)، المحاذيات (Asymptotes) • نظريات النهايات (Theorems of limits)، النهايات والاستمرارية (Limits and continuity)، من اتجاه واحد (One sided and two-sided limits)، النهاية عند اللانهاية (Limit at infinity)، المحاذيات المائلة (Oblique asymptote)، نظرية ساندوتش (Sandwich theorem)، واتجاهين، النهايات الدوال المستمرة (Continuous functions). • ميل المنحنى (The slope of the curve and derivatives)، تعريف المشتقة (differentiation)، والمشتقات • قواعد المشتقات (Rules of derivatives)، الاشتقاق الضمني (Implicit derivatives) • المشتقات من الرتبة الثانية والرتب العليا (Second and higher order differentiation) • قاعدة السلسلة (Chain rule)، المعادلات المعلمية (Parametric equations) • قاعدة لوبيتال (L'Hopital rule) • الدوال المثلثية (Trigonometric functions)، الدوال المتسامية (Transcendental Functions)، الدوال (Properties and derivatives)، الخواص والمشتقات الدوال (Inverse of trigonometric functions)، معكوس الدوال المثلثية (Logarithmic) • معكوس الدوال (Inverse of Hyperbolic Functions)، الدوال الزائدية (Hyperbolic functions)، الخصائص والمشتقات (properties and derivatives) • تطبيقات المشتقات (Applications and Derivatives) • مسائل النهايات العظمى والصغرى (Maxima and minima)، رسم المنحنى (Curve sketching) • مبرهنات رول والقيمة المتوسطة (Roll's and mean value theorems) • السرعة والتسارع (Velocity and acceleration)، معدل الارتباط (Related rate)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	97	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

	Material Covered
Week 1	معدل التغير في الدالة (The Rate of Change of Function)
Week 2	(Increments and Distance) ميل قطعة المستقيم، (Slope of the straight line)، الإحداثيات (Coordinates) معادلات القطعة المستقيمة (Equations of straight lines). الزيادات والمسافة
Week 3	المتباينات (Inequalities) الفترات، (Intervals) القيمة المطلقة، (Absolute value)
Week 4	الدوال والرسوم البيانية (Functions and graphs) المجال المقابل، (Codomain)، المجال (Domain) (Asymptotes) نقاط التقاطع مع المحاور، (Axes intercept points) التناظر، (Symmetry)، المحاذيات
Week 5	نظريات النهايات، (Theorems of limits) النهايات والاستمرارية، (Limits and continuity) من اتجاه واحد واتجاهين، (One sided and two-sided limits) النهاية عند اللانهاية، (Limit at infinity) (Continuous functions). المحاذيات المائلة، (Oblique asymptote) نظرية ساندوتش، (Sandwich theorem) النهايات الدوال المستمرة
Week 6	ميل المنحنى والمشتقات (The slope of the curve and derivatives)، تعريف المشتقة (differentiation) قواعد المشتقات، (Rules of derivatives) الاشتقاق الضمني، (Implicit derivatives)
Week 7	المشتقات من الرتبة الثانية والرتب العليا، (Second and higher order differentiation) قاعدة السلسلة، (Chain rule) المعادلات المعلمية، (Parametric equations)
Week 8	قاعدة لوبيتال (L'Hopital rule)
Week 9	(Properties and derivatives) الدوال المثلثية، (Trigonometric functions)، الدوال المتسامية (Transcendental Functions) (Logarithmic)، معكوس الدوال المثلثية، (Inverse of trigonometric functions) الخواص والمشتقات الدوال،
Week 10	(properties and derivatives) معكوس الدوال الزائدية (Inverse of Hyperbolic Functions)، الدوال الزائدية (Hyperbolic functions) الخصائص والمشتقات
Week 11	تطبيقات المشتقات (Applications and Derivatives)
Week 12	مسائل النهايات العظمى والصغرى، (Maxima and minima)، رسم المنحنى، (Curve sketching)
Week 13	مبرهنات رول والقيمة المتوسطة (Roll's and mean value theorems)
Week 14	السرعة والتسارع، (Velocity and acceleration) (problems) معدل الارتباط، (Related rate)
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Calculus Stanley – Grossman	Yes
Recommended Texts	Calculus and analytic Geometry – thomas	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Calculus II</u>		Module Delivery
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>Math1214</u>		
ECTS Credits	<u>6</u>		
SWL (hr/sem)	<u>150</u>		
Module Level	1	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader	Malik Saad	e-mail	Maliksaad@mu.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	Maliksaad@mu.edu.iq
Peer Reviewer Name	Name	e-mail	Maliksaad@mu.edu.iq
Scientific Committee Approval Date	01/10/2024	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Students learn the concept of integrals and their applications . 2. This course deals with the basic concept of integrals. 3. This is the basic subject for all integral techniques.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Explain Advanced Integration Techniques: Identify and explain when to use integration by parts, trigonometric substitution, and partial fractions for complex integrals. • Understand Infinite Series and Convergence: Distinguish between sequences and series, and define the mathematical criteria for absolute and conditional convergence. • Formulate Geometric Applications: Understand the geometric principles behind calculating areas between curves, arc lengths, and volumes of solids of revolution. • Select Optimal Integration Strategies: Analyze an integrand and systematically determine the most efficient integration technique to solve it. • Assess Series Convergence: Evaluate infinite series using appropriate convergence tests (e.g., Ratio Test, Integral Test, Comparison Tests). • Analyze Approximations: Evaluate functions using Taylor and Maclaurin series, and estimate the error margin of these polynomial approximations. •
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. التكاملات (Integration) • التكاملات غير المحددة (Indefinite integrals) ، التكاملات المحددة (Definite integrals) • المبرهنات الأساسية للتكاملات (The fundamental theorems of integrals) • صيغ التكامل الأساسية (Basic Integration Formulas) 2. (Methods of Integrations) طرق إيجاد التكاملات • التكامل بالتعويض (Integration by substitution) • تكامل لقوى (Integration of certain powers of trigonometric and hyperbolic functions) معينة من الدوال المثلثية والزاينية • التكاملات التي تتضمن التعويضات المثلثية (Integrals involving trigonometric substitutions) • التكاملات التي تتضمن التعويضات التربيعية (Integrals involving quadratic substitution) • التكامل بالتجزئة (Integration by parts) • تكامل الدوال النسبية أو الكسرية (Integration of Rational Functions) • تعريف التكامل المعتل وامثلة (Definition of improper integral) • Test for convergence and (divergence of improper integrals) • تطبيقات التكاملات المحددة (Application of Definite Integrals) • مبرهنة القيمة المتوسطة للتكاملات (Mean value theorem of integration) 3. (Volume of solid of revolution) ، (Area under the curve) (Area of surface of revolution) طول المنحني (Arc length) مساحة السطوح الدورانية ،

	- المساحة باستخدام الاحداثيات القطبية. (Area in polar coordinates). - القيمة (Average value of functions) العزوم ومركز الكتلة ، (Moments and center of mass) المتوسط للالة
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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.
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Student Workload (SWL)

الحمل الدراسي للطالب

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Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

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Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	التكاملات (Integration) (Definite integrals) التكاملات المحددة ، (Indefinite integrals) التكاملات غير المحددة
Week 2	المبرهنات الأساسية للتكاملات (The fundamental theorems of integrals) صيغ التكامل الأساسية (Basic Integration Formulas)
Week 3	طرق إيجاد التكاملات (Methods of Integrations) التكامل بالتعويض (Integration by substitution) تكامل لقوى معينة من الدوال المثلثية والزاوية (Integration of certain powers of trigonometric and hyperbolic functions)
Week 4	تكامل لقوى معينة من الدوال المثلثية والزاوية (Integration of certain powers of trigonometric and hyperbolic functions) التكاملات التي تتضمن التعويضات المثلثية (Integrals involving trigonometric substitutions)
Week 5	التكاملات التي تتضمن التعويضات التربيعية (Integrals involving quadratic substitution) التكامل بالتجزئة (Integration by parts)
Week 6	تكامل الدوال النسبية أو الكسرية (Integration of Rational Functions) تعريف التكامل المعطل وامثلة (Definition of improper integral)
Week 7	تطبيقات التكاملات المحددة (Application of Definite Integrals) مبرهنة القيمة المتوسطة للتكاملات (Mean value theorem of integration)
Week 8	المساحة تحت المنحني (Area under the curve) ، الحجم الدورانية ، (Volume of solid of revolution)
Week 9	المساحة تحت المنحني (Area under the curve) ، الحجم الدورانية ، (Volume of solid of revolution)
Week 10	طول المنحني (Arc length) ، مساحة السطوح الدورانية ، (Area of surface of revolution)
Week 11	المساحة باستخدام الاحداثيات القطبية . (Area in polar coordinates)
Week 12	المساحة باستخدام الاحداثيات القطبية . (Area in polar coordinates)
Week 13	القيمة المتوسطة للدالة (Average value of functions) ، العزوم ومركز الكتلة ، (Moments and center of mass)
Week 14	القيمة المتوسطة للدالة (Average value of functions) ، العزوم ومركز الكتلة ، (Moments and center of mass)
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
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Required Texts	Calculus Stanley – Grossman	Yes
Recommended Texts	Calculus and analytic Geometry – thomas	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Foundation of Mathematics I</u>		Module Delivery
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	Math1102		
ECTS Credits	<u>6</u>		
SWL (hr/sem)	<u>150</u>		
Module Level	1	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader	Zanab haydar	e-mail	Zanabhaydar@mu.edu.iq
Module Leader's Acad. Title	Asst. Lect	Module Leader's Qualification	MSc.
Module Tutor	Name (if available)	e-mail	Zanabhaydar@mu.edu.iq
Peer Reviewer Name	Name	e-mail	Zanabhaydar@mu.edu.iq
Scientific Committee Approval Date	01/10/2024	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	- Students learn the concept of The principles of logic Mathematical their applications - This course deals with the basic concept of Sets algebra. - This is the basic subject for all Relations and their kinds and Maps and their kinds.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Explain Propositional and Predicate Logic: Define logical connectives, truth tables, tautologies, contradictions, and quantifiers Describe Fundamental Set Theory: Define sets, subsets, power sets, Cartesian products, and operations (union, intersection, difference, symmetric difference). Understand Relations and Functions: Distinguish between relations and functions,

	and define key properties such as injectivity (one-to-one), surjectivity (onto), bijectivity, and equivalence relations. • Define Cardinality: Understand the concept of set size, differentiating between finite, countably infinite (e.g., integers), and uncountably infinite sets (e.g., real numbers).
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Compound conditional and Biconditional Statements ,Tautologies , Contradictios and Arguments ,open sentences , Quantified statements , Arguments forms , Mathematical proof methods . • The concept of set ,Equal sets , subsets , set complement , operations on sets , (Intersection and union sets , Distrbutive law , ete ...) , De – Morgans law , the Cartesian product of sets. • Relatios and their kinds : Reflexive , symmetric , Transitive • Relations and Equivalence relation , Equivalence classes and the quotient set partitions , the partially and totally order sets.. • Maps ,(Definitons and examplies ,Graph of a map , one to one Maps, on to Maps, on to one correspondence) , the kinds of Maps, (Restriction of a Map, composition of Maps and their properties , the inverse Map), the image and the inverse image of Map. Cardinal numbers, Infinte sets , countable sets , cardinal arithmetic

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

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)	97	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5

الحمل الدراسي غير المنتظم للطلاب خلال الفصل		
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	175	

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The principles of logic Mathematical
Week 2	Compound conditional and Biconditional Statements ,Tautologies , Contradictions and Arguments ,open sentences ,
Week 3	Quantified statements , Arguments forms , Mathematical proof methods .
Week 4	Sets algebra
Week 5	The concept of set ,Equal sets , subsets , set complement , operations on sets , (Intersection and union sets
Week 6	Distributive law , etc ...) , De – Morgans law , the Cartesian product of sets.
Week 7	Relations and their kinds
Week 8	Relations and their kinds : Reflexive , symmetric , Transitive Relations and Equivalence relation
Week 9	Equivalence classes and the quotient set partitions , the partially and totally order sets..
Week 10	Maps and their kinds
Week 11	Maps ,(Definitons and examples ,Graph of a map , one to one Maps, on to Maps, on to one

	correspondence),
Week 12	the kinds of Maps, (Restriction of a Map, composition of Maps and their properties , the inverse Map), the image and the inverse image of Map.
Week 13	Cardinal numbers
Week 14	Cardinal numbers, Infinte sets , countable sets , cardinal arithmetic
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Theory and problems of set Theory and Related topics , Seymour lipchutz	Yes
Recommended Texts	Introduction to the foundation of mathematic , Wildel R	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Foundations of Mathematics II</u>		Module Delivery
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>Math1215</u>		
ECTS Credits	<u>7</u>		
SWL (hr/sem)	<u>125</u>		
Module Level	1	Semester of Delivery	2
Administering Department	Mathematics	College	Science
Module Leader	Zainab haydar	e-mail	Zanabhaydar@mu.edu.iq
Module Leader's Acad. Title	Lect	Module Leader's Qualification	MSc.
Module Tutor	Name (if available)	e-mail	Zanabhaydar@mu.edu.iq
Peer Reviewer Name	Name	e-mail	Zanabhaydar@mu.edu.iq
Scientific Committee Approval Date	01/02/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	- Students learn the concept of The natural numbers. - This course deals with the basic concept of The integers , rational and real numbers. - This is the basic subject for all theory of numbers .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Explain Modular Arithmetic: Describe the properties of congruences, modular inverses, and the structures of cyclic groups under modular addition and multiplication Define Algebraic Structures: Understand and state the axioms that define fundamental algebraic structures: Groups, Rings, and Fields. Describe Prime Distribution and Divisibility: Explain the Fundamental Theorem of Arithmetic, Euclidean Algorithm, Bézout's Identity, and Fermat's Little Theorem. Identify Combinatorial Principles: Master foundational counting rules, including the Pigeonhole Principle, permutations, combinations, and binomial coefficients.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - The natural numbers - The integers - The rational numbers and The real numbers - An introduction to the theory of numbers - Fundamental of theorem of arithmetic

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

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	97	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem)	175		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The natural numbers
Week 2	The natural numbers as a well – ordered set , peano axioms for natural numbers .
Week 3	the construction of the natural numbers Mathematical induction
Week 4	The integers
Week 5	the division Algorithm for integers.
Week 6	The rational numbers and The real numbers
Week 7	The rational numbers , The real numbers and relation between them
Week 8	The construction of The complex numbers , geometry of complex numbers , the argument of a complex number , fundamental of Algebra .
Week 9	An introduction to the theory of numbers
Week 10	Divisibility of integers , the greatest common divisor
Week 11	Euclid's lemma , Relatively prime numbers
Week 12	prime numbers and the distribution of them
Week 13	Fundamental of theorem of arithmetic
Week 14	Perfect numbers
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Theory and problems of set Theory and Related topics , Seymour lipchutz	Yes
Recommended Texts	Introduction to the foundation of mathematic , Wildel R	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Finite Mathematics</u>		Module Delivery
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>Math1103</u>		
ECTS Credits	<u>5</u>		
SWL (hr/sem)	<u>125</u>		
Module Level	1	Semester of Delivery	2
Administering Department	Mathematics	College	Science
Module Leader	Rafid Habib	e-mail	RafidHabib@mu.edu.iq
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	
Peer Reviewer Name	Name	e-mail	
Scientific Committee Approval Date	01/10/2024	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Students learn the concept of The complex numbers , Polynomials , Linear systems, Matrices. 2. This is the basic subject for all theory of The complex numbers , Polynomials , Linear systems, Matrices. And its applications
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Explain Systems of Linear Equations and Matrices: Understand how to represent complex systems of equations using matrices and explain methods for solving them (e.g., Gauss-Jordan elimination, matrix inversion). • Describe Linear Programming Concepts: Define objective functions, constraints, the feasible region, and the mathematical logic of the Simplex Method. • Understand Finite Probability Models: Explain basic probability concepts, including sample spaces, conditional probability, Bayes' Theorem, and independent events. • Identify Markov Chains and Game Theory: Understand the properties of stochastic processes (Markov chains), transition matrices, and basic two-person zero-sum games.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • An introduction to the complex numbers • Polynomials • Linear systems • Matrices

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

	Material Covered
Week 1	An introduction to the complex numbers
Week 2	An introduction to the complex numbers and their properties
Week 3	Geometric representation of complex numbers , the roots of a complex numbers
Week 4	Polynomials
Week 5	Polynomials and their properties, the relation between the coefficients of a Polynomial and its roots
Week 6	solving methods for Polynomial equation of ($1^{st} - 4^{th}$) degree
Week 7	Linear systems
Week 8	Consistent , inconsistent and homogenous Linear systems and their solutions
Week 9	Consistent , inconsistent and homogenous Linear systems and their solutions
Week 10	Matrices
Week 11	Special types of matrices , Algebraic operations on matrices
Week 12	the transpose of a matrix , Symmetric and skew Symmetric matrices with some of their properties , Reduced row echelon form , row equivalent matrices
Week 13	Solving a system of Linear equations using matrices , Gauss –Jordan method , Singular and nonsingular , the inverse of a nonsingular matrix
Week 14	Determinants and their properties, Using Cofactor expansion method to find the determinants , the adjoint matrix , Solving a system of Linear equations by Gamers Rule and the matrix inverse method

Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	طرق رياضية جامعة البصرة , العراق 1985 الطبعة الاولى رياض شاكر نعيم واخرون	Yes
Recommended Texts	المصفوفات جامعة المستنصرية , العراق 1978 الطبعة الاولى عادل زينل البياتي	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Pascal Programming</u>		Module Delivery
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>Math1206</u>		
ECTS Credits	<u>5</u>		
SWL (hr/sem)	<u>125</u>		
Module Level	1	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader	Sadiq Sahib	e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/02/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	اعطاء فكرة عامة عن البرمجة وماهية البرامج وكيف يتم التعامل معها في البرمجة. كيفية التعامل مع البرامج الفرعية (الاجراءات والدوال) وكذلك الشروط وعبارات التكرار.. كيفية التعامل مع المصفوفات. التعرف على السجلات والملفات . وكيفية تمثيلها بلغة الباسكال.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Explain Structured Programming Principles: Describe the core concepts of top-down design, modularity, and structured control flow. • Identify Pascal Syntax & Structure: Recognize the strict, block-structured layout of a Pascal program (including program headers, declaration blocks, and execution blocks bounded by begin and end). • Define Primitive & Structured Data Types: Distinguish between basic Pascal data types (such as Integer, Real, Char, Boolean) and user-defined structured types (like Arrays, Records, Sets, and Files). • Understand Variable Scope: Explain the difference between global variables and local variables within nested procedures and functions.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • التعرف على واجهة البرنامج - الاوامر الاساسية • - الاوامر الاساسية المستخدمه في اللغة . • التعامل مع الشروط • طرق التكرار • المصفوفات • السجلات • الملفات • البرامج الفرعية -الاجراءات • التعامل مع الدوال

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	واجهة البرنامج، التعرف على هيكلية البرنامج- القراءة والطباعة
Week 2	بعض الاوامر المستخدمة في باسكال والتعرف على الكلمات المحجوزة
Week 3	if-then , if – then –else , nested if استخدام
Week 4	If- then else –if then else ,, case of
Week 5	التعرف على عبارات التكرار-عمليات المقارنة بين عبارات التكرار
Week 6	التكرار
Week 7	التكرار
Week 8	تعريف المصفوفه في البرنامج
Week 9	التعامل مع المصفوفات ذات البعد الواحد وتمثيلها برمجيا
Week 10	التعامل مع المصفوفات ذات البعدين وتمثيلها برمجيا
Week 11	كيف يتم تعريف السجلات بالبرمجة والتعامل معها
Week 12	تعريف الملفات بالبرمجة والتعامل معها برمجيا
Week 13	ماهو الاجراء .

Week 14	تمثيلها بالبرمجة وتعريفها برمجا
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	كتاب (باسكال وتربو باسكال للدكتور محمود نحاس)	Yes
Recommended Texts	باسكال وتربو باسكال للدكتور محمود نحاس & عوض منصور	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	<u>Logic Design for Computer</u>			Module Delivery	
Module Type	Basic			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>COS1201</u>				
ECTS Credits	<u>4</u>				
SWL (hr/sem)	<u>125</u>				
Module Level		1	Semester of Delivery		2
Administering Department		Mathematics	College	Science	
Module Leader	Sura Ibrahim Mohammed Ali		e-mail	Suraibraheem@mu.edu.iq	
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		MSc.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		3/03/2025	Version Number		1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	يهدف موضوع التصميم المنطقي الى تعليم الطالب كيفية تصميم الدوائر الالكترونية لاغراض العد والخرن كالعدادات ومسجلات الازاحة بالاضافة الى معرفة عمل وتصميم دائرة الالكترونية وانواعها . وكذلك يتم دراسة الدوائر الالكترونية الخاصة بتحويل الاشارة الرقمية الى تماثلية وكذلك محول الاشارة التماثلية الى رقمية وانواعها. ويتم ايضا توضيح اسس مراحل تصميم دوائر التتابع الرقمية المتزامنة ومعرفة اماكن تطبيقها
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Explain Binary Systems and Codes: Master conversions between different number systems (binary, octal, decimal, hexadecimal) and explain binary encoding systems like ASCII, BCD, and Gray code. □ Define Logic Gates and Boolean Algebra: State the behaviors, algebraic representations, and truth tables of fundamental logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR). □ Distinguish Between Combinational and Sequential Circuits: Explain the key structural differences between memoryless circuits (combinational) and circuits with memory feedback loops (sequential). □ Identify Standard Digital Components: Describe the purpose and operation of standard MSI (Medium Scale Integration) chips such as Adders, Decoders, Multiplexers (MUX), Latches, Flip-Flops, Counters, and Registers.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • DIGITAL SYSTEMS AND BINARY NUMBERS • BOOLEAN ALGEBRA AND LOGIC GATES • GATE LEVEL MINIMIZATION • SYNCHRONOUS SEQUENTIAL LOGIC • REGISTERS AND COUNTERS • MEMORY AND PROGRAMMABLE LOGIC

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students'
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	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.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	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 (مخرجات التعلم ذات الصلة)
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	DIGITAL SYSTEMS AND BINARY NUMBERS: Digital systems, binary numbers
Week 2	number base conversions, octal and hexadecimal numbers, complements
Week 3	signed binary numbers, binary codes, error detection and error correction codes
Week 4	BOOLEAN ALGEBRA AND LOGIC GATES: Basic definitions, axiomatic definition of Boolean Algebra
Week 5	basic theorems and properties of Boolean algebra, Boolean functions

Week 6	canonical and standard forms, other logic operations
Week 7	digital logic gates
Week 8	GATE LEVEL MINIMIZATION: The k-map method, four-variable map, five-variable map, product of sums simplification, don't-care conditions
Week 9	NAND and NOR implementation, determination and selection of Prime Implicants
Week 10	Essential and Non essential prime Implicants
Week 11	SYNCHRONOUS SEQUENTIAL LOGIC: Sequential circuits, latches, flip-flops, analysis of clocked sequential circuits, State reduction and assignment, design procedure
Week 12	REGISTERS AND COUNTERS: Registers, shift registers, ripple counters, synchronous counters, counters with unused states, ring counter, Johnson counter
Week 13	MEMORY AND PROGRAMMABLE LOGIC: Introduction, Random access memory, memory decoding, error detection and correction, read only memory
Week 14	programmable logic array, programmable array logic, sequential programmable devices
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Digital design with an introduction to the Verilog hdl , fifth edition,M.MORRIS MANO”	Yes
Recommended Texts	LECTURES in digital techniques	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Human Rights and Democracy</u>		Module Delivery
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>UOM1101</u>		
ECTS Credits	<u>3</u>		
SWL (hr/sem)	<u>75</u>		
Module Level	1	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader	Samar Abdullah		e-mail
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2024	Version Number	1.0

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

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

Module Aims أهداف المادة الدراسية	تعريف الطلبة على فهم حقوق الانسان في الحضارات القديمة والاديان السماوية و ارتباط هذه الحقوق بالتشريعات والقوانين الحالية واهمية الممارسات الديمقراطية حسب الانظمة الدولية ومشاركة الفرد بالرأي الواضح في ممارسته لعملية الانتخابات وهذه الاراء البناءة تصب في خدمة المواطن والمجتمع
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- ان فهم الطالب لحقوقه العامة واحترام حقوق الآخرين 2- حسب التشريعات القديمة والاديان السماوية وممارست 3- الحق في الرأي في مجالات الحياة السياسية والاقتصاد والاجتماعية
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • اكتساب معرفة حقوقه العامة وحقوق الآخرين من خلال الحقوق في الحضارات والاديان والتشريعات الحديثة في المجتمعات وفي الامور السياسية والاقتصادية والاجتماعية • مفهوم الديمقراطية – تعريف الديمقراطية – المرنكات الفكرية للديمقراطية – قياس الديمقراطية – الاسلاميون والديمقراطية – الديمقراطية والثوري – الديمقراطية والرأسمالية

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.
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Student Workload (SWL)

الحمل الدراسي للطلاب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1.5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome (مخرجات التعلم ذات الصلة)
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	

	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	حقوق الانسان في الحضارات القديمة/ العراقية اليونانية الرومانية
Week 2	حقوق الانسان في الاديان السماوية الاسلام والمسيحية
Week 3	مفهوم حقوق الانسان عند الفلاسفة توماس هوبز وجان جاك روسو
Week 4	بعض المواد من الاعلان العالمي لحقوق الانسان
Week 5	مضمون الاعلان العالمي الاعتراف الدولي ومراحله
Week 6	عالمية حقوق الانسان وعدم تعارضها مع الخصوصية الوطنية
Week 7	-الديمقراطية-تعريفها
Week 8	الصعوبات-مظاهر الديمقراطية
Week 9	عناصر النمط الديمقراطي - الانتخابات - طرق الانتخابات - الرقابة على الانتخابات - النواب والمسؤولية - البرلمان
Week 10	المعارضة - عناصر تحديد موقع المعارضة - الفصل بين الحكومة والبرلمان - الشرعية الدستورية
Week 11	الشروط العامة للديمقراطية - احترام حقوق الانسان - الحقوق المدنية - الحقوق السياسية
Week 12	التعددية السياسية - الحزب السياسي - النظم الحزبية - نظام الحزب الواحد - نظام الحزبين - نظام الاحزاب المتعددة
Week 13	ديمقراطية الاحزاب - التداول السلمي والشرعي للسلطة - المساواة السياسية - احترام مبدأ الاغلبية - وجود دولة القانون
Week 14	انماط الديمقراطية - الديمقراطية المباشرة - الديمقراطية شبه المباشرة - الديمقراطية النيابية - الديمقراطية التشاركية - الديمقراطية الليبرالية - الديمقراطية التوافقية
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	حقوق الانسان / تطور ها / مفاهيمها / حمايتها الاستاذ الدكتور : رياض عزيز هادي جامعة بغداد / كلية العلوم السياسية المنشورات والتقارير حول حقوق الانسان / جامعة بغداد	Yes
Recommended Texts	كتاب الديمقراطية مفاهيم وتجارب للدكتور حسن لطيف الزبيدي والاستاذ نعمة محمد العبادي	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Arabic Language</u>		Module Delivery
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>UOM1204</u>		
ECTS Credits	<u>3</u>		
SWL (hr/sem)	<u>75</u>		
Module Level	1	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader	Ali Jawad	e-mail	
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2024	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	تعلم الطلبة على اللغة العربية الفصحى . ضبط قواعدها النحوية والصرفية والإملائية السليمة معرفة الصواب والخطأ في العبارات والجمل .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- يجب ان يتعلم الطلبة قواعد اللغة العربية السليمة . ان يتعلم الطلبة لغة القرآن الكريم ونصوصه ومعانيه 3- يجب ان يتعلم الطلبة قسماً من دواوين العرب ونثره . 2- يجب
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - تعلم اللغة العربية الفصحى وضبط قواعدها النحوية والصرفية والإملائية - المبتدأ والخبر - ان واخواتها - كان واخواتها - المفاعيل - الاملاء .

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.
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Student Workload (SWL)

الحمل الدراسي للطلاب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	1.5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	تعلم اللغة العربية الفصحى وضبط قواعدها النحوية والصرفية والاملائية
Week 2	المبتدأ والخبر
Week 3	ان واخواتها
Week 4	كان واخواتها
Week 5	المفاعيل، المفعول به، المفعول المطلق، المفعول لأجله
Week 6	الاملاء، رسم التاء الطويلة والقصيرة، رسم الهزمة المتوسطة على الالف والواو والياء، رسم الهزمة المتطرفة على الالف والواو والياء والمنفردة على السطر
Week 7	النصوص، النص القرآني من سورة الكهف والمعاني وقسم من الملاحظات الاسلوبية المتعلقة بالنص القرآني. النص القرآني من سورة الانسان والمعاني وقسم من الملاحظات الاسلوبية المتعلقة بالنص.
Week 8	قصيدة المتنبي (شعب يوان) مع الملاحظات المتعلقة بالقصيدة، قصيدة امرؤ القيس (المعلقة) مع الملاحظات المتعلقة بالمعلقة.
Week 9	نص نثري للجاحظ في وصف الكتاب والملاحظات المتعلقة بالنص.
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	سيبويه، شرح ابن عقيل	Yes

Recommended Texts		Yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>English Language I</u>		Module Delivery
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>UOM1104</u>		
ECTS Credits	<u>3</u>		
SWL (hr/sem)	<u>75</u>		
Module Level	1	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader	Hussein Ali	e-mail	
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2024	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This course aims to develop students' basic English language skills, including speaking, listening, reading, and writing, through essential grammar and vocabulary. By the end of the course, students will be able to communicate simple ideas, ask and answer questions, and understand basic conversations in everyday situations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Demonstrate basic proficiency in reading and understanding general and academic English texts. • Apply essential grammar and vocabulary in writing clear and coherent sentences and short paragraphs. • Develop listening and speaking skills for effective communication in everyday academic contexts.
Indicative Contents المحتويات الإرشادية	• Basic Grammar Structures – Verb tenses, subject-verb agreement, articles, prepositions. • Vocabulary Development – Common academic and everyday terms, word formation, and usage. • Reading Comprehension – Understanding main ideas, scanning for details, summarizing short texts. • Writing Skills – Sentence construction, paragraph writing, punctuation, and coherence. • Listening Practice – Listening for gist and specific information in conversations and lectures. • Speaking Activities – Everyday dialogue, pronunciation practice, simple presentations, and discussions.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Interactive Lectures and Discussions – To introduce and explain key grammar and vocabulary topics. Task-Based Learning – Engaging students in real-life communication tasks to enhance language use. Group and Pair Work – Promoting collaborative learning through dialogues, role-plays, and discussions. Listening and Speaking Practice – Using audio materials, videos, and guided conversations. Reading and Writing Exercises – Focused activities to build comprehension and composition skills. Use of Multimedia and E-learning Tools – Supporting language acquisition through digital platforms and language apps.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.5
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 (مخرجات التعلم ذات الصلة)
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction to English –greetings, and basic classroom phrases
Week 2	Pronouns and Basic Verbs – I, you, he, she, it, we, they + verb "to be" (am, is, are)
Week 3	Introducing Yourself and Others – My name is..., This is..., Who is he/she?
Week 4	Numbers and Basic Questions – What's your phone number? How old are you?
Week 5	Family and Possession – My, your, his, her + family vocabulary
Week 6	Daily Routines and Simple Present (I/you/we/they) – I wake up at 7 AM
Week 7	Talking About People – He, she, it + Present Simple (works, eats, sleeps)
Week 8	Places and Directions – Prepositions of place (in, on, under, next to)
Week 9	Telling Time and Dates – What time is it? Days of the week, months, seasons
Week 10	Past Events and Was/Were – Where were you yesterday? I was at home
Week 11	Food and Shopping – Countable/uncountable nouns, some/any
Week 12	Describing Things and Comparisons – Big, bigger, the biggest, adjectives

Week 13	Talking About Abilities – Can/can't for ability (I can swim, I can't drive)
Week 14	Future Plans – Going to + verb (I'm going to visit my friend)
Week 15	Revision and Practice – Reviewing key topics through exercises and conversation
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	New headway by Liz and John Soars.	Yes
Recommended Texts		Yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Computer I</u>		Module Delivery
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>UOM1203</u>		
ECTS Credits	<u>4</u>		
SWL (hr/sem)	<u>100</u>		
Module Level	1	Semester of Delivery	1
Administering Department	Mathematics	College	Science
Module Leader	Abdul Mohsen Abdul Hadi	e-mail	
Module Leader's Acad. Title	Asst. Lect.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2024	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	تعريف الطالب بأساسيات الحاسبات ومراحل تطورها. تعريف الطالب بالرياضيات الخاصة بجهاز الحاسبة (النظام الثنائي) تعريف الطالب بالأجزاء المادية للحاسوب ودور كل منها في عمل الحاسوب وكيفية الاستفادة منها. تعريف أنظمة التشغيل وأهمية دورها في عمل الحاسبة مع توضيح نظام تشغيل MS-DOS تعلم نظام تشغيل Windos 7 بألقان لتمكينه من استثمار امكانية الحاسبة. توضيح المخاطر التي يمكن ام تواجهه الحاسبة من فيروسات واحصنة طروادة وكيفية التعامل معها والحماية نها بالشكل السليم
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- تعريف الحاسوب وتطوره، تعريف نظام التشغيل واهيته، تعريف الاجزاء المادية للحاسوب. 2- تعريف النظام الثنائي وكيفية اداء العمليات الرياضية بوساطته 3- تعريف نظام MS-DOS وتطوره التاريخي وتعريف اولمرة 4- تعريف نظام تشغيل Windows 7 وتعريف مكوناته وطرق استعمال والحماية من الفيروسات
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • اكساب المعرفة في علم الحاسوب وتحويل هذه المعرفة الى سلوك يسهم في تعلمة المواد الدراسية الاخرى

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Computer Science - Definitions - Applications
Week 2	Phases of the Computer Life Cycle
Week 3	Generations of Computers
Week 4	Types of Computers - Classification of Computers According to Farmers' Needs - Classification According to Performance - Data Input
Week 5	Computer Components - Additional Parts and Features
Week 6	Program Opening Methods - Main Interfaces of Word 2010 - Ribbons
Week 7	Main Text (Word Art)
Week 8	Main Text (Counters)
Week 9	General Settings (Save, Frames, Effects, Print)
Week 10	General Settings - Preview Ruler - Page Numbering - Headers and Footers
Week 11	Typing Instructions
Week 12	Plain Text - Search and Replace
Week 13	References - Hyperlinks - Markup
Week 14	Inserting Parameters, Symbols, and Icons
Week 15	Page Layout Menu
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the
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		Library?
Required Texts	اساسيات الحاسوب وتطبيقاته المكتبية البرنامج العملي وورد 2010	Yes
Recommended Texts		Yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

المرحلة الثانية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Advance Calculus I</u>		Module Delivery
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>Math24113</u>		
ECTS Credits	<u>6</u>		
SWL (hr/sem)	<u>150</u>		
Module Level	2	Semester of Delivery	1
Administering Department	Mathematics	College	Science
Module Leader	Aws Nadal		e-mail aws@mu.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/02/2025	Version Number	1.0

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

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

Module Aims أهداف المادة الدراسية	1. Training and qualifying students on functions with two or more variables, how to find their limits and partial derivatives, and some applications of partial derivatives. 2. Teaching them the applications of integrals in finding areas and volumes, building on what they learned in the first year. 3. Providing students with experience in dealing with different coordinates and performing various integrals.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Explain the Real Number System: Define the completeness axiom, the supremum and infimum of sets, and the Archimedean property of $\mathbb{R}$ • Define Metric Space Topology: Understand basic topological concepts in $\mathbb{R}$ and metric spaces, including open and closed sets, limit points, compact sets (Heine-Borel theorem), and connected sets. • Understand Rigorous Limits and Continuity: Define formal epsilon-delta limits of sequences and functions, and explain uniform continuity versus pointwise continuity. • Differentiate Convergence Modes: Distinguish between pointwise and uniform convergence for sequences and series of functions.
Indicative Contents المحتويات الإرشادية	• Functions and Graphs – Definition, types of functions, domain and range, graphing techniques. • Limits and Continuity – Evaluating limits, one-sided limits, infinite limits, and continuity of functions. • Derivatives – Concept of the derivative, rules of differentiation, higher-order derivatives. • Applications of Derivatives – Tangents, rates of change, maxima and minima, optimization problems, curve sketching. • Implicit Differentiation and Related Rates – Techniques and problem-solving strategies. • The Mean Value Theorem – Rolle's Theorem, applications in analysis. • Antiderivatives and Basic Integration – Indefinite integrals, basic integration rules, initial value problems. • Definite Integrals and the Fundamental Theorem of Calculus – Area under a curve, net change, properties of definite integrals.

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.5
Total SW +L (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	The concept of a function in several variables, its domain, codomain, and function representation.
Week 2	The goal (definition of the goal and related theorems). Continuity and its theorems for a function in several variables.
Week 3	The derivative (definition and related theorems). The relationship between the derivative and several variables. Continuity of a function.
Week 4	Partial and complete differentiation.
Week 5	Differential of vector functions of two or more variables.
Week 6	Applications of differentiation for functions of two or more variables.
Week 7	Increasing and decreasing.
Week 8	Lagrange's equation.

Week 9	Double integral.
Week 10	Engineering and physical applications.
Week 11	Cylindrical and spherical coordinates.
Week 12	Triple integral. and engineering applications.
Week 13	Line integrals.
Week 14	Relationship between double and triple integrals.
Week 15	Crane's theorem.
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Calculus Stanley – Grossman	Yes
Recommended Texts	Calculus and analytic Geometry – thomas	Yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Advance Calculus II</u>		Module Delivery	
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>Math24113</u>			
ECTS Credits	<u>6</u>			
SWL (hr/sem)	<u>150</u>			
Module Level	2	Semester of Delivery		2
Administering Department	Mathematics	College	Science	
Module Leader	Aws Nadal		e-mail	aws@mu.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/02/2025	Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	- Students learn the concept of functions with multiple variables and their partial derivatives and their applications and repeated integrals and their applications. - This course deals with the basic concept of calculus II. - This is the basic subject for all functions with multiple variables.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This second-level course extends the rigorous topological and limit-based proofs established in Advanced Calculus I to the theories of integration (Riemann and Riemann-Stieltjes), multivariable calculus (derivatives in R^n and differential forms .
Indicative Contents المحتويات الإرشادية	Techniques of Integration – Integration by parts, trigonometric integrals, trigonometric substitution, partial fractions. Improper Integrals – Convergence and evaluation of integrals with infinite limits or discontinuities. Applications of Integration – Area between curves, volumes of solids of revolution, arc length, surface area. Sequences and Series – Convergence tests, geometric and harmonic series, p-series, comparison and ratio tests. Power Series – Representation of functions as power series, interval and radius of convergence. Taylor and Maclaurin Series – Expansion of functions into series, error estimation. Parametric Equations – Graphing and analyzing curves defined parametrically. Polar Coordinates and Graphs – Converting between coordinate systems, area and arc length in polar form.

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.5
Total SW	150		

+L (h/sem)

الحمل الدراسي الكلي للطلاب خلال الفصل

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Real Sequences
Week 2	Series
Week 3	Some Special Types of Series
Week 4	Infinite Series
Week 5	Series with Positive Terms
Week 6	Convergence Tests
Week 7	Oscillating Series
Week 8	Absolute and Conditional Convergence
Week 9	Power Series
Week 10	Range of Convergence
Week 11	Derivative and Integral Series
Week 12	Taylor and Maclaurin Series
Week 13	Taylor and Maclaurin Series
Week 14	Solutions of Equations Using Power Series
Week 15	Final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Calculus Stanley – Grossman	Yes
Recommended Texts	Calculus and analytic Geometry – thomas	Yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Group Theory</u>		Module Delivery
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>Math23010</u>		
ECTS Credits	<u>6</u>		
SWL (hr/sem)	<u>150</u>		
Module Level	2	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader	Hadeel Kareem	e-mail	
Module Leader's Acad. Title	Asst. Lect.	Module Leader's Qualification	MSc.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2024	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Introducing students to the basic concepts and important theorems in the basic topics of algebra 2. Equipping students with the basic concepts of group theory and the basic theorems in groups and their applications. 3. At the end of this chapter, the student will be able to • Create complex examples in the topic of group theory. • Prove new theorems, preliminaries and results in the topic of group theory
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Group Theory is the mathematical study of symmetry. By studying abstract algebraic systems under single operations, students learn to identify deep, structural commonalities across diverse domains—ranging from geometry and matrix arithmetic to cryptography and molecular chemistry
Indicative Contents المحتويات الإرشادية	

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.5
Total SW +L (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Binary operations, groups with some examples.
Week 2	Subgroups with examples.
Week 3	Semigroups, cyclic groups with theorems and examples.
Week 4	Normal subgroups.
Week 5	Quotient groups.
Week 6	Participant groups with some theorems and exercises.
Week 7	Simple groups.
Week 8	Modularity and symmetry.
Week 9	Kernel and image.
Week 10	Symmetry theorems.
Week 11	Some applications and examples.
Week 12	Derived subgroups.
Week 13	Commutator.
Week 14	Cello's theorems.
Week 15	Applications of Cello's theorems.
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the
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		Library?
Required Texts	Abstract algebra (Group Theory) , R-Kumar, U.B. Jawahar Nagar, Delhi, 2006.	Yes
Recommended Texts	Abstract Algebra, Burton, Addison-Wesley, 1967	Yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Linear Algebra</u>		Module Delivery	
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>Math 23111</u>			
ECTS Credits	<u>4</u>			
SWL (hr/sem)	<u>100</u>			
Module Level	2	Semester of Delivery		1
Administering Department	Mathematics	College	Science	
Module Leader	Zainab Haidar	e-mail	zainab.hayder@mu.edu.iq	
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)	e-mail	E-mail	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	01/10/2024	Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	- لتعليم الطالب تعاريف فضاء المتجهات وكيفية الربط بين المصفوفات - اعطاء المفاهيم الاساسيه لموضوع الفضاءات المتجه, البعد والقاعدة.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Explain Vector Spaces and Subspaces: Define vector spaces, subspaces, linear independence, spanning sets, and bases. • Describe Linear Transformations: Understand how matrices act as linear mappings between vector spaces, and identify kernel (null space) and range (column space). • Define Matrix Decompositions: Understand the concepts behind key matrix factorizations, including LU Decomposition, Diagonalization, and Singular Value Decomposition (SVD). • Define Eigenvalues and Eigenvectors: State the geometric and algebraic meanings of eigenvalues and eigenvectors ($AX=\lambda X$) and explain how they relate to matrix diagonalization.
Indicative Contents المحتويات الإرشادية	Systems of Linear Equations – Methods of solving systems, including Gaussian and Gauss-Jordan elimination. Matrices and Matrix Operations – Addition, multiplication, inverse, transpose, and special types of matrices. Determinants – Properties, calculation methods, and applications in solving systems. Vectors and Vector Spaces – Linear independence, span, basis, dimension, and subspaces. Linear Transformations – Definition, kernel and image, matrix representation of linear maps. Eigenvalues and Eigenvectors – Characteristic equation, diagonalization, and applications.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Lectures and Theoretical Explanations – To introduce core concepts and mathematical structures clearly and systematically. 2. Problem-Solving Sessions – Guided practice on solving linear systems, computing determinants, and working with vectors and matrices. 3. Interactive Discussions – Encouraging students to explore proofs and logical reasoning through group participation. 4. Assignments and Homework – Regular practice tasks to reinforce understanding and promote independent learning. 5. Formative Assessments and Quizzes – Frequent short evaluations to monitor progress and address learning gaps.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
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Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2.5
Total SW +L (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Vector Spaces and Subspaces
Week 2	Linear Independence with Some Related Theorems
Week 3	Foundations of Vector Spaces
Week 4	Dimensions of Vector Spaces and Their Properties
Week 5	Row and Column Order of a Matrix and Their Relationship
Week 6	Orthogonal Norm Bases
Week 7	Linear Transformations
Week 8	Some Applications of Linear Transformations
Week 9	Transformation Kernel
Week 10	Some Applications
Week 11	Transformation Range
Week 12	Linear Transformation Matrix
Week 13	Some Applications
Week 14	Properties of Linear Transformation Matrix
Week 15	Some Applications

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	مقدمة في الجبر الخطي مع تطبيقات. تأليف د. عادل غسان و د. باسل الهاشمي	Yes
Recommended Texts	Introductory Linear Algebra with Applications By Bernard Kolman	Yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Programming C++</u>		Module Delivery
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>COS2305</u>		
ECTS Credits	<u>5</u>		
SWL (hr/sem)	<u>100</u>		
Module Level	2	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader	Safaa Salam Hatem	e-mail	Safaa.salam@mu.edu.iq
Module Leader's Acad. Title	Asst. Lect.	Module Leader's Qualification	MSc.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2024	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1 - التعرف على لغة برمجة تعد امتداد للغات التي يحتاج الطالب دراستها 2 - ان يتعلم الطالب تصميم الكثير من المشاريع الدراسية سواء في تحليل البيانات أو في عرض فكرة من خلال برنامج أو شرح نتائج البحث وغير ذلك 3 - تدريب الطالب على استخدام وتصميم الخوارزميات في حل المسائل 4 - معرفة طرق تطوير برامج والاستفادة منها 5 - الالمام بالخوارزميات الأساسية 6 - معرفة طرق تطوير برامج والاستفادة منها 7 - الالمام بالخوارزميات الأساسية
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Explain Object-Oriented Programming (OOP) Principles: Define the core tenets of OOP, including Encapsulation, Abstraction, Inheritance, and Polymorphism. • Understand Memory Management: Explain how memory is laid out in C++, distinguishing between Stack memory (automatic allocation) and Heap memory (dynamic allocation). • Define Pointers and References: Describe the physical address-based nature of pointers, how they differ from references, and the role of the dereference operator (*) and address-of operator (&). • Identify STL Components: Explain the structure and purpose of the Standard Template Library (STL), including containers (vectors, maps, sets), iterators, and algorithms.
Indicative Contents المحتويات الإرشادية	• The indicative content for a university-level C++ Programming module details the specific topics, concepts, and weekly themes covered throughout the course. • This curriculum is structured to take students from procedural fundamentals to advanced object-oriented design and memory management.

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
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Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to C++
Week 2	Variables
Week 3	Statements
Week 4	Order evaluation and math libraries
Week 5	Selection Statements
Week 6	If-then-else statement
Week 7	for) statement)
Week 8	While-do while Statement)
Week 9	Breaking statement
Week 10	Array of One Dimension
Week 11	Array of Two Dimension
Week 12	Examples of array
Week 13	Functions
Week 14	Types of Functions
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Dr.Nassir H.Salman," C++ Programing with 469 Solved Problems"	Yes
Recommended Texts		yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Computer II</u>		Module Delivery
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>UOM2314</u>		
ECTS Credits	<u>4</u>		
SWL (hr/sem)	<u>100</u>		
Module Level	2	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader	Abdul Mohsen Abdul Hadi		e-mail
Module Leader's Acad. Title	Asst. Lect.	Module Leader's Qualification	MSc.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/02/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	تعريف الطالب بأساسيات الحاسبات ومراحل تطورها. تعريف الطالب بالرياضيات الخاصة بجهاز الحاسبة (النظام الثنائي) تعريف الطالب بالأجزاء المادية للحاسوب ودور كل منها في عمل الحاسوب وكيفية الاستفادة منها. تعريف أنظمة التشغيل وأهمية دورها في عمل الحاسبة مع توضيح نظام تشغيل MS-DOS تعلم نظام تشغيل Windos 7 بأفقان لتمكينه من استثمار امكانية الحاسبة. توضيح المخاطر التي يمكن ان تواجهه الحاسبة من فيروسات واحصنة طروادة وكيفية التعامل معها والحماية بها بالشكل السليم
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- تعريف الحاسوب وتطوره، تعريف نظام التشغيل وأهيتته، تعريف الاجزاء المادية للحاسوب. 2- تعريف النظام الثنائي وكيفية اداء العمليات الرياضية بواسطة 3- تعريف نظام MS-DOS وتطوره التاريخي وتعريف اولمرة 4- تعريف نظام تشغيل Windows 7 وتعريف مكوناته وطرق استعمال والحماية من الفيروسات
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • اكساب المعرفة في علم الحاسوب وتحويل هذه المعرفة الى سلوك يسهم في تعلمة المواد الدراسية الاخرى

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
Total SW +L (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The PowerPoint Environment 1- The Title Bar 2- The Ribbon 3- The Presentation View Buttons 4- The Zoom Slider
Week 2	Creating New Presentations 1- Saving Presentations 2- Inserting New Slides 3- Applying Slide Layouts 4- Working with PowerPoint File Formats
Week 3	USING PRESENTATION VIEWS 1- Normal View 2- Slide Sorter View 3- Notes Page View 4- Slide Show View
Week 4	Adding Text to Slides 1- Font Formatting 2- Paragraph Formatting 3- Applying Custom Bullets and Numbering 4- Setting Text Box Options
Week 5	USING CLIP ART Inserting Clip Art and Pictures Using Picture Tools 3- The Format Picture Dialog Box
Week 6	USING SMARTART 1- Inserting and SmartArt 2- Formatting SmartArt
Week 7	USING SLIDE SHOW VIEW 1- Running a Slide Show 2- Using Custom Shows
Week 8	PRINTING YOUR PRESENTATION 1- Using Page Setup 2- Setting the Slide Header and Footer 3- Using Print Preview 4- Printing
Week 9	APPLYING ANIMATION 1- Adding Slide Transition Animation 2- Adding Custom Animation
Week 10	DRAWING OBJECTS 1- Inserting Shapes

	2- Formatting Shapes .3- WordArt
Week 11	INSERTING VIDEO AND SOUND 1- Inserting Videos 2- Inserting Audio 3- Animating Multimedia Playback 4- Recording a Sound
Week 12	USING THEMES 1- Applying Themes 2- Customizing Themes 3- Formatting the Slide Background
Week 13	USING PRESENTATION MASTERS 1-Using Slide Masters and Slide 2- Using the Notes Master 3- Using the Handout Master 4- Saving a Presentation Template
Week 14	APPLYING ACTIONS 1- Inserting Actions 2- Inserting Hyperlinks
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	سيبويه , شرح ابن عقيل	Yes
Recommended Texts		Yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Arabic Language</u>		Module Delivery
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>UOM2405</u>		
ECTS Credits	<u>3</u>		
SWL (hr/sem)	<u>75</u>		
Module Level	2	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader	Ali Jawad	e-mail	
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/02/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	تعلم الطلبة على اللغة العربية الفصحى . ضبط قواعدها النحوية والصرفية والإملائية السليمة معرفة الصواب والخطأ في العبارات والجمل .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- يجب ان يتعلم الطلبة قواعد اللغة العربية السليمة . 2- يجب ان يتعلم الطلبة لغة القرآن الكريم ونصوصه ومعانيه 3- يجب ان يتعلم الطلبة قسماً من دواوين العرب ونثره .
Indicative Contents المحتويات الإرشادية	• تعلم اللغة العربية الفصحى وضبط قواعدها النحوية والصرفية والإملائية • المبتدأ والخبر • ان واخواتها • كان واخواتها • المفاعيل • الاملاء

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.
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Student Workload (SWL)

الحمل الدراسي للطلاب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	1.5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	تعلم اللغة العربية الفصحى وضبط قواعدها النحوية والصرفية والاملائية
Week 2	المبتدأ والخبر
Week 3	ان واخواتها
Week 4	كان واخواتها
Week 5	المفاعيل, المفعول به, المفعول المطلق, المفعول لأجله
Week 6	الاملاء, رسم التاء الطويلة والقصيرة, رسم الهمزة المتوسطة على الالف والواو والياء, رسم الهمزة المتطرفة على الالف والواو والياء والمنفردة على السطر
Week 7	النصوص, النص القرآني من سورة الكهف والمعاني وقسم من الملاحظات الاسلوبية المتعلقة بالنص القرآني. النص القرآني من سورة الانسان والمعاني وقسم من الملاحظات الاسلوبية المتعلقة بالنص.
Week 8	قصيدة المتنبي (شعب بوان) مع الملاحظات المتعلقة بالقصيدة, قصيدة امرؤ القيس (المعلقة) مع الملاحظات المتعلقة بالمعلقة.
Week 9	نص نثري للجاحظ في وصف الكتاب والملاحظات المتعلقة بالنص.
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	سیبویه , شرح ابن عقیل	Yes
Recommended Texts		Yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Probability and statistics</u>		Module Delivery
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>Math 24016</u>		
ECTS Credits	<u>6</u>		
SWL (hr/sem)	<u>150</u>		
Module Level	2	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader	Hadeel Hadi	e-mail	
Module Leader's Acad. Title	Asst. Lect.	Module Leader's Qualification	MSc.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/02/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	التعرف على المفاهيم للعينات والمجموعات ان يتعلم الطالب أسلوب جمع وتبويب وتلخيص البيانات مع الأمثلة تحليل البيانات وفهم بعض المؤشرات الإحصائية بالأمثلة استعمال المؤشرات في الجانب التطبيقي بالإضافة إلى التعرف على نظرية الاحتمالات والاحتمال الشرطي وبعض التوزيعات.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Explain Axiomatic Probability: Define sample spaces, events, mutually exclusive outcomes, and the axioms of probability, including conditional probability and Bayes' Theorem. • Distinguish Probability Distributions: Identify and explain the properties of discrete distributions (Binomial, Poisson, Geometric) and continuous distributions (Normal, Exponential, Uniform). • Describe the Central Limit Theorem (CLT): Explain why the sampling distribution of the mean approaches a normal distribution as sample size increases, regardless of the population's original shape. • Understand Statistical Inference Principles: Explain the concepts of point estimation, confidence intervals, null and alternative hypotheses, Type I/II errors, and p-values.
Indicative Contents المحتويات الإرشادية	The indicative content for a university-level Probability and Statistics module spans from data foundations up to the predictive modeling techniques used in engineering, analytics, and data science.

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem)	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5

الحمل الدراسي غير المنتظم للطلاب خلال الفصل		
Total SW +L (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150	

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Basic Statistical Concepts and Terminology
Week 2	The Purpose of Statistical Study
Week 3	Comprehensive Census and Samples
Week 4	Systematic and Random Errors
Week 5	Tabular and Graphical Presentation
Week 6	Distributions by Variable Type
Week 7	Histogram, Polygon, and Frequency Curve
Week 8	Data Analysis
Week 9	Arithmetic Mean, Median, and Mode
Week 10	Relationships and Partial Measures
Week 11	Examples of Previous Measures
Week 12	Relationships between Measures in Cases of Symmetry and Skewness
Week 13	Scatter or Spread
Week 14	Most Common Measures of Dispersion
Week 15	Preparatory Week Before the Final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	الغرابي,سليم اسماعيل وسيفي,علي محمد صادق "مبادئ -1 (1985) الإحصاء" العراق-جامعة بغداد المشهداني,محمود حسن وهرمز,أمير حنا "الإحصاء" العراق -2 (1989) جامعة بغداد 3-R.Hoggand A.Grage "Introduction to mathematical statistics"NEW YORK (1974). 4-J.N.KAPUR and H.C.SAXENA "Mathematical Statistics"NEW DELHI-110 055.	Yes
Recommended Texts	R.Hoggand A.Grage "Introduction to mathematical statistics"NEW YORK (1974).	Yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Partial Differential Equations I		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	Math35121			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery		1
Administering Department	Mathematics	College	Science	
Module Leader	Yaseen Merzah Hemza		e-mail	yaseenmerzah@mu.edu
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2023		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Students learn the concept of partial differential equations and their applications such as heat equation, wave equation, Laplace equation . 2. This course deals with the basic concept of partial differential equations. 3. This is the basic subject for all types of partial differential equations such as linear, nonlinear, and methods for solving various types of these equations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Classify Partial Differential Equations: Identify the order, linearity, and homogeneity of a given PDE. For second-order linear PDEs, mathematically classify them as elliptic, parabolic, or hyperbolic using the discriminant method. • Understand Physical Formulations: Explain the physical derivation and underlying assumptions behind the three fundamental classical equations: • The Wave Equation (hyperbolic: modeling vibrating strings/membranes) • The Heat Equation (parabolic: modeling thermal diffusion) • Laplace's / Poisson's Equation (elliptic: modeling steady-state potentials) • Formulate Boundary and Initial Conditions: Correctly define and distinguish between Dirichlet (specified values), Neumann (specified derivatives/flux), and Robin (mixed) boundary conditions required to make a PDE problem well-posed.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • مقدمة الى المعادلات التفاضلية الجزئية (Introduction to Partial Differential Equations) • التعريف والتصنيف (Definition and Classifications) • مشاكل الانتشار الحراري (Heat Diffusion Type Problems) • مشاكل من نوع الانتشار (Diffusion-type problems (parabolic equations)) • الشروط الحدودية لمشاكل الانتشار (Boundary conditions for diffusion-type problems) • اشتقاق معادلة الحرارة (Derivation of the heat equation) • فصل المتغيرات (Separation of variables) • تحويل الشروط الحدودية (Transforming nonhomogeneous BCs into homogenous ones) • حل مشاكل أكثر تعقيداً عن طريق فصل المتغيرات (Solving more complicated problems by separation of variables) • تحويل معادلات معقدة إلى معادلات أسهل (Transforming hard equations into easier ones) • حل المعادلات (Solving nonhomogeneous PDEs (Eigen function expansions)) • التحويلات التكاملية (Integral transforms (sine and cosine)) • تحويل فورييه وتطبيقه (The Fourier transform and its application to PDEs) • الحل باستخدام تحويلات لابلاس (Solution using Laplace transforms) • مشاكل من النوع الزائدي (Hyperbolic-Type Problems) • معادلة الموجة أحادية البعد (The one-dimensional wave equation (hyperbolic equations)) • دي المبرت لحل معادلة طريقة (The D'Alembert method of the wave equation)

	• (Boundary conditions associated with the wave equation) الشروط الحدودية المرتبطة بمعادلة الموجة • (The Finite vibrating string (standard wave)) الوتر المهتز المنتهي (الموجة القياسية) • (First-order equations (method of characteristics)) معادلات الدرجة الأولى طريقة (المميز) • (Elliptic-Type Problems) مشاكل من النوع الإهليلجي • (The Laplacian (an intuitive description)) معادلة لابلاس (وصف بديهي) • (General Nature of boundary-value problems) الطبيعة العامة لمشاكل القيم الحدودية • (Interior Dirichlet problems for a circle) مشاكل ديريشلي الداخلية لدائرة • (The Dirichlet problem in an annulus) مشكلة ديريشلي في الحلقة • (Laplace's equation in spherical coordinates) معادلة لابلاس في الإحداثيات الكروية • (A nonhomogeneous Dirichlet problem .(Green's functions)) دوال مشكلة ديريشلي غير المتجانسة (Green's functions) • (Systems of linear PDEs) أنظمة معادلات تفاضلية جزئية خطية •
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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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.5
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 (مخرجات التعلم ذات الصلة)
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

	Material Covered
Week 1	(Introduction to Partial Differential Equations) مقدمة الى المعادلات التفاضلية الجزئية (Definition and Classifications) التعريف والتصنيف
Week 2	(Heat Diffusion Type Problems) مشاكل الانتشار الحراري (Diffusion-type problems (parabolic equations)) مشاكل من نوع الانتشار
Week 3	(Boundary conditions for diffusion-type problems) الشروط الحدودية لمشاكل الانتشار (Derivation of the heat equation) اشتقاق معادلة الحرارة
Week 4	(Separation of variables) فصل المتغيرات (Transforming nonhomogeneous BCs into homogenous ones) تحويل الشروط الحدودية غير المتجانسة إلى متجانسة
Week 5	(Solving more complicated problems by separation of variables) حل مشاكل أكثر تعقيداً عن طريق فصل المتغيرات (Transforming hard equations into easier ones) تحويل معادلات معقدة إلى معادلات أسهل
Week 6	(Solving nonhomogeneous PDEs (Eigen function expansions)) حل المعادلات التفاضلية غير متجانسة (توسعات الدوال الذاتية) (Integral transforms transforms) (sine and cosine) التحويلات التكاملية (تحويلات الجيب وجيب التمام)
Week 7	(The Fourier transform and its application to PDEs) تحويل فورييه وتطبيقه على المعادلات التفاضلية الجزئية

	الحل باستخدام تحويلات لابلاس (Solution using Laplace transforms)
Week 8	مشاكل من النوع الزائدي (Hyperbolic-Type Problems) معادلة الموجة أحادية البعد المعادلات الزائدي (hyperbolic equations). (The one-dimensional wave equation)
Week 9	طريقة دي المبرت لحل معادلة الموجة (The D'Alembert method of the wave equation) الشروط الحدودية المرتبطة بمعادلة الموج (Boundary conditions associated with the wave equation)
Week 10	الوتر المهتز المنتهي (الموجة القياسية) (The Finite vibrating string (standard wave)) معادلات الدرجة الأولى طريقة المميز (First-order equations (method of characteristics))
Week 11	مشاكل من النوع الإهليلجي (Elliptic-Type Problems) معادلة لابلاس (وصف بديهي) (The Laplacian (an intuitive description))
Week 12	الطبيعة العامة لمشاكل القيم الحدودية (General Nature of boundary-value problems) مشاكل دريشلي الداخلية لدائرة (Interior Dirichlet problems for a circle)
Week 13	مشكلة دريشلي في الحلقة (The Dirichlet problem in an annulus) معادلة لابلاس في الإحداثيات الكروية (Laplace's equation in spherical coordinates)
Week 14	مشكلة دريشلي غير المتجانسة دوال كرين (A nonhomogeneous Dirichlet problem. (Green's functions)) أنظمة معادلات تفاضلية جزئية خطية (Systems of linear PDEs)
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- المعادلات التفاضلية الجزئية – عطاالله ثامر العاني	Yes
Recommended Texts	2- Partial differential equations and solitary wave equation - Wazwaz	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Numerical Analysis I</u>		Module Delivery
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>Math35119</u>		
ECTS Credits	<u>6</u>		
SWL (hr/sem)	<u>150</u>		
Module Level	3	Semester of Delivery	1
Administering Department	Mathematics	College	Science
Module Leader		e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Students learn the concept of Error analysis, determination of roots positions, direct methods, Iterative methods, Forward central and backward approximation of derivatives, Interpolation methods, Numerical differentiation .

	2. This course deals with the basic concept of numerical methods and its properties. 3. This is the basic subject for all types of Solving equation by numerical methods.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Explain Sources of Numerical Error: Define and distinguish between round-off error, truncation error, absolute error, and relative error, and describe how floating-point arithmetic (such as the IEEE 754 standard) affects computational precision. • Understand Iterative Methods for Root-Finding: Describe the formulation, mechanics, and geometric intuition behind bracket methods (Bisection, Regula Falsi) and open methods (Fixed-Point Iteration, Newton-Raphson, Secant Method). • Describe Polynomial Interpolation Theory: Explain the mathematical construction of interpolating polynomials using Lagrange polynomials and Newton's divided differences. • Detail Numerical Calculus Schemes: Understand the mathematical derivation of finite difference formulas for differentiation, as well as Newton-Cotes formulas (such as the Trapezoidal rule and Simpson's rules) for integration.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Error sources • Solutions of nonlinear equations • Numerical solutions of linear systems • The convergence condition • Interpolation methods • Numerical differentiation

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.5
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 (مخرجات التعلم ذات الصلة)
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Error analysis ,Round-off error, Relative error ,Absolute error
Week 2	Determination of roots positions , The bisection method
Week 3	Fixed point iterative method, Newton –Raphson method
Week 4	Conditions and order of convergence of the methods, Aitkins method to accelerate the convergence
Week 5	Direct methods (Gaussian elimination method L-U decomposition methods)
Week 6	Iterative methods (Jacobi , Gauss-siedel and successive over relaxation methods)
Week 7	Iterative methods , ill-conditioned systems
Week 8	Lagrange method
Week 9	divided differences , forward backward and central differences
Week 10	Newton formulas of finite differences
Week 11	piece-wise polynomial approximation (linear and cubic splines)
Week 12	piece-wise polynomial approximation (linear and cubic splines)
Week 13	Forward central and backward approximation of derivatives
Week 14	Error analysis and discussions
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Numerical Analysis, Burden , 1985	Yes
Recommended Texts	Introduction to Numerical Analysis , Froberg C. E., London, 1969	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	<u>Numerical Analysis II</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>Math36124</u>				
ECTS Credits	<u>6</u>				
SWL (hr/sem)	<u>150</u>				
Module Level		3	Semester of Delivery		1
Administering Department		Mathematics	College	Science	
Module Leader			e-mail		
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2023	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	- Students learn the concept of Numerical Integration, Least square approximation, Boundary and initial value problems - This course deals with the basic concept of numerical methods and its properties on integration. - This is the basic subject for all types of Solving ordinary and partial differential equation by numerical methods.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Understand ODE Solver Design: Detail the derivation, step-size mechanics, and structural differences of single-step methods (Euler's, Heun's, and Runge-Kutta families) and multi-step methods (Adams-Bashforth, Adams-Moulton). Formulate Boundary Value Problem Schemes: Explain the mathematical formulation of the Shooting Method and Finite Difference Methods (FDM) for solving second-order linear and non-linear BVPs. Explain PDE Discretization: Describe how partial differential equations are projected onto finite grids using explicit and implicit finite difference stencils (such as the Crank-Nicolson method for the heat equation). Identify Eigenvalue Approximation Theories: Explain the mathematical principles underlying iterative eigenvalue algorithms, including the Power Method, Inverse Power Method, and QR factorization.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - Numerical Integration - Least square approximation - First order ordinary differential equations - Higher order ordinary differential equations - Boundary value problems - Initial value problems - Partial differential equations

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.5
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 (مخرجات التعلم ذات الصلة)
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Numerical Integration
Week 2	Trapezoidal rule , simpsons rule
Week 3	Mid – point rule, Error analysis , Romberg method
Week 4	Opened and closed Newton – cotes methods , Gauss – Legendre method.
Week 5	Last square method, Linear and non Linear and exponential approximation
Week 6	continuous function approximation
Week 7	Explicit and implicit Eulers method
Week 8	Toylor series method, second and fourth order Runge – Kutta methods
Week 9	Adam – Bashforth multi – step methods , predictor – corrector methods
Week 10	Order of numerical methods
Week 11	Higher order ordinary differential equations
Week 12	Finite difference method for Linear equations
Week 13	Boundary value problems , Initial value problems ,The shooting method
Week 14	Partial differential equations, Numerical solutions of parabolic , Hyperbolic and elliptic Partial differential equations using the finite difference method
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Numerical Analysis, Burden , 1985	Yes
Recommended Texts	Introduction to Numerical Analysis , Froberg C. E., London 1969	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Mathematical Statistics I</u>		Module Delivery
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>Math35122</u>		
ECTS Credits	<u>4</u>		
SWL (hr/sem)	<u>100</u>		
Module Level	3	Semester of Delivery	1
Administering Department	Mathematics	College	Science
Module Leader		e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	أهداف المادة الدراسية
	1. التعرف على المفاهيم العامة للمتغيرات العشوائية

	2. ان يراجع الطالب دوال الكثافة ودوال الكتلة الاحتمالية وبعض الخصائص ذات العلاقة 3. بعض التوزيعات المتقطعة 4. بعض التوزيعات المستمرة 5. العلاقات بين التوزيعات الاحتمالية
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. اكتساب الخبرة والمعرفة في التعامل مع البيانات وكيفية أخذ المعلومات منها 2. تفسير المدخلات والمخرجات وكيفية التعامل معها 3. إيجاد المؤشرات المشهورة 4. حساب بعض المقاييس من التوزيعات الاحتمالية 5. الاشارة الى بعض التطبيقات العملية
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • مفاهيم عامة • خطوات الطريقة الإحصائية • أساليب جمع البيانات الإحصائية • أنواع الأخطاء • عرض البيانات الإحصائية • التوزيعات التكرارية • العرض البياني أو الهندسي • مفهوم المؤشرات الإحصائية • مقاييس النزعة المركزية • بعض العلاقات بين مقاييس النزعة المركزية • مقاييس الالتواء • مفهوم التشتت • بعض مقاييس التشتت • العلاقات بين مقاييس التشتت وبراهين ذات علاقة

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

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	مفاهيم عامة
Week 2	خطوات الطريقة الإحصائية
Week 3	أساليب جمع البيانات الإحصائية
Week 4	أنواع الأخطاء
Week 5	عرض البيانات الإحصائية
Week 6	التوزيعات التكرارية
Week 7	العرض البياني أو الهندسي
Week 8	مفهوم المؤشرات الإحصائية
Week 9	مقاييس النزعة المركزية
Week 10	بعض العلاقات بين مقاييس النزعة المركزية

Week 11	مقاييس الالتواء
Week 12	مفهوم التشتت
Week 13	بعض مقاييس التشتت
Week 14	العلاقات بين مقاييس التشتت وبراهين ذات علاقة
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Introduction to Mathematical Statistics, R.Hoog ,New York; 1974	Yes
Recommended Texts	R. Hoog and Grage , introduction to mathematical statistics”1974, NewYork	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematical Statistics II		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	Math36126		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader		e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	اعطاء فكرة عامة عن مجموعه من المفاهيم مثل فترات الثقة للمعدل والتباين , اخبار الفرضيات واختبار الترجيح الاعظم و... 1. الخ.

	2. اعطاء التعاريف واشتقاق القوانين 3. اعطاء وحل بعض الامثلة والتطبيقات
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This advanced course shifts from basic probability and descriptive statistics to the rigorous, theoretical mathematical proofs underlying statistical estimation, hypothesis testing, asymptotic theory, and Bayesian inference.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • التخمين بفترة • فترات الثقة الى المعدل • فترات الثقة الى الفرق بين معدلين • فترات الثقة الى التباين • فترات الثقة الى النسبة بين تباينين • فترات الثقة الى الاحتمال • فترات الثقة الى الفرق بين احتمالين • اختبار الفرضيات • الفرضية الاحصائية • المنطقة الحرجة • افضل منطقة حرجة • الزمر القابلة للحل مع تطبيقاتها • مبرهنة Galios • مبرهنة كوشي

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

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4

الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	فترات الثقة الى المعدل
Week 2	فترات الثقة الى الفرق بين معدلين
Week 3	فترات الثقة الى التباين
Week 4	فترات الثقة الى النسبة بين تباينين
Week 5	فترات الثقة الى الاحتمال
Week 6	فترات الثقة الى الفرق بين احتمالين
Week 7	اختبار الفرضيات
Week 8	الفرضية الاحصائية
Week 9	المنطقة الحرجة
Week 10	افضل منطقة حرجة
Week 11	الزمر القابلة للحل مع تطبيقاتها
Week 12	مبرهنة Galios
Week 13	مبرهنة كوشي

Week 14	بعض التطبيقات والمثلة
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Introduction to Mathematical Statistics, R.Hoog ,New York; 1974	Yes
Recommended Texts	R. Hoog and Grage , introduction to mathematical statistics”1974, NewYork	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Ring Theory I</u>		Module Delivery
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>Math35120</u>		
ECTS Credits	<u>5</u>		
SWL (hr/sem)	<u>125</u>		
Module Level	3	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader		e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	أهداف المادة الدراسية 1. ان يتعلم الطالب الأمثلة المختلفة للحلقات وخواصها 2. كيفية انتقال هذه الخواص من خلال الهومومورفيزمات

	3. الفرق بين الحلقة والحقل 4. المثاليات
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. ان يكون لدى الطالب معرفة كافية حول الفضاءات المختلفة وتعريفها
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • الحلقة وخواصها • العناصر القاسمه للصفر • الساحة والحقل • الحلقة الجزئية • مميز الحلقة وخواصها • التشاكلات الحلقية • اعمار الحلقات • العناصر المتحايدة • العناصر عديمة القوى • المثاليات تعاريف وامثله • الحلقة الكسرية • التشاكل الحلقى • المثاليات الاولى والعظمى • انواع المثاليات • حلقة بولين وبعض الخواص

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	3.5

الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	الحلقة وخواصها
Week 2	العناصر القاسمه للصفر
Week 3	الساحه والحقل
Week 4	الحلقة الجزئية
Week 5	مميز الحلقة وخواصها
Week 6	التشاكلات الحلقية
Week 7	اغمار الحلقات
Week 8	العناصر المتحايدة
Week 9	العناصر عديمة القوى
Week 10	المثاليات تعاريف وامثله
Week 11	الحلقة الكسرية
Week 12	التشاكل الحلقى
Week 13	المثاليات الاولى والعظمى
Week 14	انواع المثاليات، حلقة بولين وبعض الخواص
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to modern abstract algebra by Burton	Yes
Recommended Texts	Abstract algebra by Burton	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Ring Theory II		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	Math36125		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader		e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. ان يتعلم الطالب الأمثلة المختلفة للحلقات وخواصها 2. كيفية انتقال هذه الخواص من خلال الهومومورفيزيمات وكذلك المفاهيم الاساسية للموديولات

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. ان يكون لدى الطالب معرفة كافية حول الفضاءات المختلفة وتعريفها
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • التشاكلات الحلقية • انتقال بعض الخواص بواسطة التشاكلات • بعض النظريات حول التشاكلات • حلقات متعددة الحدود • نظريات + خواص • قابلية القسمة + خوارزمية القسمة • توسيع الحقول • حلقات بولين+الجبر البولي • نظرية باقي القسمة • السلاسل المتناهية • نظريات + خواص • مبرهنة كرونكير • الموديالات

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

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5

Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150
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Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome (مخرجات التعلم ذات الصلة)
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	التشاكلات الحلقية
Week 2	انتقال بعض الخواص بواسطة التشاكلات
Week 3	بعض النظريات حول التشاكلات
Week 4	حلقات متعددة الحدود
Week 5	نظريات + خواص
Week 6	قابلية القسمة + خوارزمية القسمة
Week 7	توسيع الحقول
Week 8	حلقات بولين+الجبر البولي
Week 9	نظرية باقي القسمة
Week 10	السلاسل المثالية
Week 11	نظريات + خواص
Week 12	مبرهنة كرونكر
Week 13	الموديالات
Week 14	تعريف + امثلة
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to modern abstract algebra by Burton	Yes
Recommended Texts	Abstract algebra by Burton	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematical Analysis I		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	Math35119		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader		e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Students learn the concept of Real numbers, the relation between real and rational numbers, Archimedean property, $\mathbb{R}$ is complete ordered field, The density of rational numbers theorem, The density of irrational numbers theorem.

	- This course deals with the basic concept of Pseudo-metric spaces, Euclidean spaces, Blondenness, Some principles in topology - This is the basic subject for all types of Limit and continuity.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- The student should have sufficient knowledge about Real numbers, the relation between real and rational numbers, Archimedean property, R is complete ordered field, The density of rational numbers theorem, The density of irrational numbers theorem - Everything the student can be transformed from one form to another equivalent to the original form. - Summarize the topic is supported by detailed examples. - Questions and answers, discussion and daily exams. - Assign the student to solve daily questions and ask new questions and discuss with the students. - Daily discussion and exams.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - Fundamental concepts - Metric spaces - Convergence in metric spaces - Infinite series - Limit and continuity

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5

Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150
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Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome (مخرجات التعلم ذات الصلة)
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Historical review, Real numbers, the relation between real and rational numbers, Archimedean property, R is complete ordered field, The density of rational numbers theorem, The density of irrational numbers theorem
Week 2	Definitions and examples, Pseudo-metric spaces, Euclidean spaces, Bloneness, Some principles in topology
Week 3	Sequences, real sequences
Week 4	Convergence in metric spaces, Some special real sequences
Week 5	complete metric spaces, Fixed point theorem
Week 6	Metric space, Definitions and examples, Some special Infinite series
Week 7	Converging test, Alternations series, Absolutely and conditional convergence
Week 8	another convergence tests
Week 9	Limits of functions, theorems of limits, Some extensions of limit concept
Week 10	Continuous functions, Equivalent theorem for continuity, Sequentially continuity
Week 11	Uniform continuity, Real valued function, The intermediate value property, cup of coffee theorem
Week 12	Compact sets, Some important theorem in compactness, Continuity and compactness
Week 13	Separated sets, Connected sets, Equivalent theorem
Week 14	Derivatives, Space of Differentiable functions, Properties of derivative, Rolle's theorem, mean value theorem
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	مقدمة في التحليل الرياضي , عادل غسان نعوم , جامعة بغداد 1986 الاولى	Yes
Recommended Texts	Probability and measure theory , Ash . R.B , NEW YOrk 2000 2nd	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematical Analysis II		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	Math36123		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader		e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Students learn the concept of Sequence and series of functions, Measure, The Lebesgue Integral . 2. This course deals with the basic concept of Riemann integral and some

	theorems related for integrability, Lebesgue theorem in Riemann integration, Elementary properties of Riemann integral 3. This is the basic subject for all types of Function of bounded variation, some type of functions of bounded variation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The student should have sufficient knowledge about Sequence and series of functions, Measure, The Lebesgue Integral 2. Everything the student can be transformed from one form to another equivalent to the original form. 3. Summarize the topic is supported by detailed examples. 4. Questions and answers, discussion and daily exams. 5. Assign the student to solve daily questions and ask new questions and discuss with the students. 6. Daily discussion and exams.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Sequence and series of functions • Integral • Measure • The Lebesgue Integral • Functions of bounded variation

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.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.5
Total SWL (h/sem)	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction, point wise convergence, Uniformly convergence
Week 2	bounded convergence, the relation between three types of convergence, Infinite series of functions, Power series
Week 3	Riemann integral and some theorems related for integrability
Week 4	Lebesgue theorem in Riemann integration, Elementary properties of Riemann integral
Week 5	Mean value theorem for integral, the space of integral functions as a linear space
Week 6	Riemann integral is (linear, monotone, not injective) function, Differentiation and Riemann integration
Week 7	Riemann-Steiljes integral, Definition and examples and some of its properties
Week 8	The length of bounded open sets, The outer measure of bounded sets
Week 9	the inner measure of bounded sets, Measure sets, Measure of bounded sets
Week 10	Measure of unbounded sets, Example for unmeasurable sets, Measurable functions
Week 11	Some equivalent theorems for measurable functions, Space of measurable functions
Week 12	The properties of lebesgue integral, the relation between lebesgue and Riemann integral, the space of Lebesgue integral functions
Week 13	Function of bounded variation, some type of functions of bounded variation, absolutely continuity, relation between absolutely continuity and functions of bounded variation
Week 14	Function of bounded variation, some type of functions of bounded variation, absolutely continuity, relation between absolutely continuity and functions of bounded variation
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	مقدمة في التحليل الرياضي , عادل غسان نعيم , جامعة بغداد 1986 الاولى	Yes
Recommended Texts	Probability and measure theory , Ash . R.B , NEW YOrk 2000 2nd	yes
Websites		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Arabic Language II</u>		Module Delivery
Module Type	<u>Basic</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>UOM1202</u>		
ECTS Credits	<u>2</u>		
SWL (hr/sem)	<u>50</u>		
Module Level	1	Semester of Delivery	
Administering Department	Mathematics	College	Science
Module Leader	Ali Jawad	e-mail	
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2024	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	تعلم الطلبة على اللغة العربية الفصحى . ضبط قواعدها النحوية والصرفية والإملائية السليمة معرفة الصواب والخطأ في العبارات والجمل .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- يجب ان يتعلم الطلبة قواعد اللغة العربية السليمة . ان يتعلم الطلبة لغة القرآن الكريم ونصوصه ومعانيه 3- يجب ان يتعلم الطلبة قسماً من دواوين العرب ونثره . 2- يجب
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - تعلم اللغة العربية الفصحى وضبط قواعدها النحوية والصرفية والإملائية - المبتدأ والخبر - ان واخواتها - كان واخواتها - المفاعيل - الاملاء .

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.
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Student Workload (SWL)

الحمل الدراسي للطلاب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	1.5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	تعلم اللغة العربية الفصحى وضبط قواعدها النحوية والصرفية والاملائية
Week 2	المبتدأ والخبر
Week 3	ان واخواتها
Week 4	كان واخواتها
Week 5	المفاعيل, المفعول به, المفعول المطلق, المفعول لأجله
Week 6	الاملاء, رسم التاء الطويلة والقصيرة, رسم الهمزة المتوسطة على الالف والواو والياء, رسم الهمزة المتطرفة على الالف والواو والياء والمنفردة على السطر
Week 7	النصوص, النص القرآني من سورة الكهف والمعاني وقسم من الملاحظات الاسلوبية المتعلقة بالنص القرآني. النص القرآني من سورة الانسان والمعاني وقسم من الملاحظات الاسلوبية المتعلقة بالنص.
Week 8	قصيدة المتنبي (شعب يوان) مع الملاحظات المتعلقة بالقصيدة, قصيدة إمرؤ القيس (المعلقة) مع الملاحظات المتعلقة بالمعلقة.
Week 9	نص نثري للجاحظ في وصف الكتاب والملاحظات المتعلقة بالنص.
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	سيبويه, شرح ابن عقيل	Yes
Recommended Texts		Yes
Websites		