Dept. Of mathematics

Level One (UGI)

Semester One

Ministry of Higher Education and Scientific Research
University of Baghdad
College of Science
Department of Mathematics

Module Description Form

نموذج وصف الوحدة الدراسية

Module Information معلومات الوحدة الدراسية			
Module Title	Mathematical Physics 1		**Delivery Methods**
Delivery Methods	Core		☑ **Theory** ☐ **Lecture** ☐ **Laboratory** ☑ **Tutorial**
Module Code	MAT1104		
ECTS Credits	4		
Total Study Workload (Hours/Semester)	100		
Module Level	2	**Approval Date by the Scientific Committee**	
Department	Mathematics	**Semester of Delivery**	1
Personnel and Administration			
Module Leader	Dr Dahlia Khaled Bahlool	**College**	Science
Academic Title	Assistant Professor (PhD)	**Email**	dahlia.khaled@sc.uobaghdad.edu.iq
Module Tutor		**Email**	
Peer Reviewer		**Additional Email Addresses**	

Administration Date	13th of Aug. 2024	**Version Number**	1

Relationship with Other Modules			
Prerequisite Modules	None	**Semester**	___
Co-requisite Module	None	**Semester**	___

Module Objectives, Module Learning Outcomes, and Indicative Content **أهداف الوحدة الدراسية ونتائج التعلم والمحتوى الإرشادي**	
Module Objectives **أهداف الوحدة الدراسية**	1. Fundamental Physics Concepts: This course provides students with a foundational understanding of classical mechanics, including studying motion, forces, and conservation laws. 2. Problem-Solving Skills: Develop analytical abilities to solve physics problems by integrating mathematics with physical concepts. 3. Experimental Skills: Promote the execution and interpretation of basic experiments for hands-on learning. 4. Preparation for Advanced Studies: Build a strong base for future subjects like electromagnetism, quantum mechanics, and thermodynamics.
Module Learning Outcomes **مخرجات التعلم للوحدة**	1. Classical Mechanics Application: Explain motion and forces using Newton's laws in both one and two dimensions. 2. Energy and Momentum Conservation: Calculate kinetic and potential energies and apply conservation laws to resolve mechanics issues. 3. Conduct Basic Experiments: Execute straightforward physics experiments, evaluate data, and link findings to theoretical concepts. 4. Communicate Physics Concepts: Clearly express physics principles and experimental outcomes through reports and presentations. 5. Mathematical Integration: Apply calculus and vector analysis to represent and predict physical phenomena.
Indicative Content **المحتوى الإرشادي**	1. Kinematics: Analyze motion independent of its causes, covering displacement, velocity, acceleration, and equations for uniformly accelerated motion. 2. Dynamics: Apply Newton's laws in one and two dimensions to investigate the forces driving motion. 3. Work, Energy, Power: Study the work done by forces, kinetic and potential energies, conservative forces, and the principle of mechanical energy conservation. 4. Particle Systems and Momentum: Explore the centre of mass motion, momentum conservation, impulse, and types of collisions. 5. Rotational Motion: Examine concepts of rotational kinematics, dynamics, angular momentum conservation, and torque. 6. Oscillations and Waves: Analyze simple harmonic motion, mass-spring systems, pendulums, and mechanical waves. 7. Experimental Techniques: Learn basic experimental methods, how to analyze data and errors, and use measurement tools effectively.

Learning and Teaching Strategies

استراتيجيات التعلم والتدريس	
Strategies	**1.** Lectures on Effective Time Management • Conduct structured sessions emphasizing time management's critical role in academic and professional settings. These sessions will explore proven strategies for enhancing personal productivity, including task prioritization, overcoming procrastination, and using practical time-tracking tools. **2.** Collaborative Group Work • Implement group-based assignments to strengthen teamwork, communication, and collective problem-solving abilities. By promoting peer collaboration, the program enhances understanding and cultivates a shared commitment to achieving educational objectives. **3.** Integration of Accessible Online Resources • Leverage user-friendly digital platforms and online courses to support ongoing skill development and reinforce course content. Provide access to a wide range of learning materials, ensuring flexible, independent learning and continuous engagement beyond the traditional classroom environment.

Student Workload (SWL) **الحمل الدراسي للطلاب لمدة 15 أسبوعًا**			
Structured SWL (hours/semester) **الحمل الدراسي المنتظم للطالب خلال الفصل**	63	**Structured Study Workload (hours/week)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	4.0
Unstructured SWL (hours/semester) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	37	**Unstructured Study Workload (hours/week)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	2.6
Total SWL (hours/semester) **الحمل الدراسي الكلي للطالب خلال الفصل**	100		

Module Evaluation **تقييم الوحدة الدراسية**					
		Time/Number	**Weight (Marks)**	**Weekly Due**	**Relevant Learning Outcomes**
Assessment Methods include	**Quizzes**	4	16%	5, 10	4
	Assignments	4	16%	3, 14	4
	Projects/Laboratories	___	___	___	___
	Reports	2	8%	___	2
Summative Assessments	**Midterm Examination**	2 hours	10%	7	2 hours

	Final Examination	3 hours	50%	17	3 hours
Total Assessment		100%			

Weekly Syllabus Delivery Plan **منهج أسبوعي نظري لخطة التسليم**	
Week	**Material Covered**
Week 1	Vectors and Scalars • An introduction to vectors and scalars, including their properties and the concepts of dot and cross products.
Week 2	Equality of Vectors • Understanding the criteria for vector equality with real-world applications.
Week 3	Components of Vectors and Inertia Mass • Breaking down vectors into their components and exploring the concept of inertia mass.
Week 4	Units of Force: Newton and Dyne • Learning about the units of force by comparing Newtons and Dynes.
Week 5	Newton's Three Laws of Motion • A comprehensive study of Newton's laws and their significance in mechanics.
Week 6	Gravity and Kepler's Laws • An exploration of gravitational forces and Kepler's laws governing planetary motion.
Week 7	Midterm Exam and Discussion • Taking the midterm exam, followed by a discussion to clarify any concepts and answer questions.
Week 8	Calculus of Variation • An introduction to the calculus of variations and the Euler-Lagrange equations.
Week 9	Wave and Diffusion Equations • The formulation and understanding of wave and diffusion equations.
Week 10	Separation of Variables • Applying the method of separation of variables in Laplacian equations in physics.
Week 11	Examples and Applications • Hands-on applications of mathematical concepts to solve physical problems.
Week 12	Cylindrical Polar Coordinates • Using cylindrical polar coordinates to address physics-related challenges.
Week 13	Spherical Polar Coordinates • Applying spherical polar coordinates in both theoretical and practical contexts.
Week 14	Advanced Examples

	• Case studies involving quantum particles in potential wells and mass on vibrating drums.
Week 15	Review • A comprehensive review of course topics in preparation for the final exam.
Week 16	Final Examination

Resources for Teaching and Learning **الموارد المخصصة للتدريس والتعلم**		
	Resource Availability	**Library Resource Availability**
Required Texts	*Riley, K.F., Hobson, M.P. and Bence, S.J., 2006. Mathematical methods for physics and engineering: a comprehensive guide. Cambridge University Press.* *Gregory, R.D., 2006. Classical mechanics. Cambridge University Press.*	Yes
Recommended Texts	The central library, science library, and departmental repository house crucial texts and distinctive resources pertinent to Mathematical Physics.	Yes
Websites	– Specialized academic websites. – Virtual library services provide resources that are accessible from international university libraries.	

Grading Scheme **مخطط الدرجات**				
Assessment Groups and Corresponding Grades	**Grade**		**Marks (%)**	**Definition**
Success Group (50–100)	**Grade A**	Excellent	90–100	Outstanding Performance
	Grade B	Very Good	80–89	Above-Average Performance with Minor Errors
	Grade C	Good	70–79	Acceptable Work with Noticeable Errors
	Grade D	Satisfactory	60–69	Satisfactory – Fair Performance with Significant Shortcomings
	Grade E	Sufficient	50–59	Meets Minimum Requirements
Fail Group (0–49)	**Grade FX**	Fail	45–49	Additional Work Required; Credit Awarded
	Grade F	Fail	0–44	Substantial Improvement Needed

Important Note on Grade Rounding: In line with our commitment to fair academic assessment, all decimal grades will be rounded to the nearest whole number. For example, a grade of 54.5 will be rounded to 55, whereas 54.4 will be rounded to 54. Any modifications to the grades initially assigned by evaluators will strictly follow this automated rounding process.

Ministry of Higher Education and Scientific Research
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Department of Mathematics

Module Description Form

نموذج وصف الوحدة الدراسية

Module Information معلومات الوحدة الدراسية			
Module Title	Foundation of Mathematics 1		**Delivery Methods**
Delivery Methods	Core		☑ **Theory** ☐ **Lecture** ☐ **Laboratory** ☑ **Tutorial**
Module Code	MAT1102		
ECTS Credits	8		
Total Study Workload (Hours/Semester)	200		
Module Level	2	**Approval Date by the Scientific Committee**	
Department	Mathematics	**Semester of Delivery**	1
Personnel and Administration			
Module Leader	Dr Hassan Fadhil Ridha	**College**	Science
Academic Title	Professor (PhD)	**Email**	hassan.fadhil.r@sc.uobaghdad.edu.iq
Module Tutor	Dr Hiba Abdullah Ahmed	**Email**	hiba.ahmed@sc.uobaghdad.edu.iq

Peer Reviewer		**Additional Email Addresses**	
Administration Date	13th of Aug. 2024	**Version Number**	1

Relationship with Other Modules			
Prerequisite Modules	None	**Semester**	___
Co-requisite Module	None	**Semester**	___

Module Objectives, Module Learning Outcomes, and Indicative Content **أهداف الوحدة الدراسية ونتائج التعلم والمحتوى الإرشادي**	
Module Objectives **أهداف الوحدة الدراسية**	**1.** Develop Basic Math Skills: Build a strong foundation in essential mathematical concepts for more advanced studies. **2.** Enhance Problem-Solving Abilities: Explore key principles to improve students' capacity to solve math problems. **3.** Foster Logical Thinking: Cultivate critical thinking and reasoning skills essential in mathematics. **4.** Prepare for Advanced Topics: Ready students for specialized and complex areas of mathematics.
Module Learning Outcomes **مخرجات التعلم للوحدة**	**1.** Grasp Key Concepts: Understand and apply introductory algebra, geometry, and trigonometry. **2.** Resolve Math Problems: Use various techniques to solve mathematical issues effectively. **3.** Employ Logical Reasoning: Use analytical skills to navigate problem-solving situations. **4.** Express Math Concepts: Clearly articulate mathematical ideas verbally and in writing.
Indicative Content **المحتوى الإرشادي**	**1.** Algebra: Introduction to expressions, equations, functions, and graphs. **2.** Geometry: Exploration of shapes, proofs, and properties related to congruence and similarity. **3.** Trigonometry: Fundamentals of trigonometric ratios and their applications in real life. **4.** Calculus Basics: Introduction to limits, derivatives, and elementary differentiation. **5.** Statistics and Probability: Essential concepts in data representation and measures of central tendency. **6.** Problem-Solving Strategies: Techniques for tackling problems using logical reasoning and algorithms. **7.** Mathematical Proofs: Fundamentals of constructing and understanding mathematical proofs.

Learning and Teaching Strategies **استراتيجيات التعلم والتدريس**	
Strategies	**4.** Lectures on Effective Time Management • Conduct structured sessions emphasizing time management's critical role in academic and professional settings. These sessions will explore proven strategies for enhancing personal productivity, including task prioritization, overcoming procrastination, and using practical time-tracking tools. **5.** Collaborative Group Work • Implement group-based assignments to strengthen teamwork, communication, and collective problem-solving abilities. By promoting peer collaboration, the program enhances understanding and cultivates a shared commitment to achieving educational objectives. **6.** Integration of Accessible Online Resources

	• Leverage user-friendly digital platforms and online courses to support ongoing skill development and reinforce course content. Provide access to a wide range of learning materials, ensuring flexible, independent learning and continuous engagement beyond the traditional classroom environment.

Student Workload (SWL) الحمل الدراسي للطلاب لمدة 15 أسبوعًا			
Structured SWL (hours/semester) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured Study Workload (hours/week)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.0
Unstructured SWL (hours/semester) الحمل الدراسي غير المنتظم للطالب خلال الفصل	137	**Unstructured Study Workload (hours/week)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	9.3
Total SWL (hours/semester) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم الوحدة الدراسية					
		Time/Number	**Weight (Marks)**	**Weekly Due**	**Relevant Learning Outcomes**
Assessment Methods include	**Quizzes**	4	16%	5, 10	4
	Assignments	4	16%	3, 14	4
	Projects/Laboratories	___	___	___	___
	Reports	2	8%	___	2
Summative Assessments	**Midterm Examination**	2 hours	10%	7	2 hours
	Final Examination	3 hours	50%	17	3 hours
Total Assessment		100%			

Weekly Syllabus Delivery Plan منهج أسبوعي نظري لخطة التسليم

Week	Material Covered
Week 1	Introduction to Sets • Learn the basics of sets, including key operations and the Distributive Law.
Week 2	Logical Foundations • Introduction to De Morgan's Laws, logical statements, and principles of equivalence.
Week 3	Propositions and Logic • Explore propositions, truth tables, tautologies, contradictions, and the structure of logical arguments.
Week 4	Proof Techniques • Understand methods of indirect proof, use of quantifiers, and an introduction to formal proofs.
Week 5	Relations and Set Theory • Study relations, equivalence relations, and partitions within set theory.
Week 6	Advanced Set Operations • Delve into advanced set algebra, focusing on intricate relations and equivalence.
Week 7	Mid-term Examination and Discussion • Take the mid-term exam covering Weeks 1-6 material, followed by a discussion to clarify concepts.
Week 8	Ordered Sets • Investigate ordered sets, product sets, equivalence classes, and partially ordered sets.
Week 9	Order Properties • Learn about the properties of totally ordered sets, including maximal and minimal elements.
Week 10	Functions • Understand the concept of functions, including function composition and inverses.
Week 11	Foundations of Set Theory • Explore the Axiom of Choice and the idea of equivalent sets in set theory.
Week 12	Cardinality and Paradoxes • Examine cardinal numbers, paradoxes in set theory, and the principle of mathematical induction.
Week 13	Number Systems and Axioms • Study Peano's axioms, the integers, the division algorithm, and rational and real numbers.
Week 14	Properties of Numbers and Complex Numbers • Discuss the Archimedean property, the density of numbers, complex numbers, and De Moivre's Theorem.
Week 15	Comprehensive Review • Review all course topics in preparation for the final exam.
Week 16	Final Examination

Resources for Teaching and Learning

المواردالمخصصة للتدريس والتعلم		
	Resource Availability	**Library Resource Availability**
Required Texts	*Eves, H., 1997. Foundations and Fundamental Concepts of Mathematics. Dover Publications.* *Kurtz, D.C., 1992. Foundations of abstract mathematics.*	Yes
Recommended Texts	The central library, science library, and departmental repository contain essential texts and unique resources of the Foundation of Mathematics.	Yes
Websites	– Specialized academic websites. – Virtual library services provide resources that are accessible from international university libraries.	

Grading Scheme **مخطط الدرجات**				
Assessment Groups and Corresponding Grades	**Grade**		**Marks (%)**	**Definition**
Success Group (50–100)	**Grade A**	Excellent	90–100	Outstanding Performance
	Grade B	Very Good	80–89	Above-Average Performance with Minor Errors
	Grade C	Good	70–79	Acceptable Work with Noticeable Errors
	Grade D	Satisfactory	60–69	Satisfactory – Fair Performance with Significant Shortcomings
	Grade E	Sufficient	50–59	Meets Minimum Requirements
Fail Group (0–49)	**Grade FX**	Fail	45–49	Additional Work Required; Credit Awarded
	Grade F	Fail	0–44	Substantial Improvement Needed
Important Note on Grade Rounding: In line with our commitment to fair academic assessment, all decimal grades will be rounded to the nearest whole number. For example, a grade of 54.5 will be rounded to 55, whereas 54.4 will be rounded to 54. Any modifications to the grades initially assigned by evaluators will strictly follow this automated rounding process.				

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Module Description Form

نموذج وصف الوحدة الدراسية

Module Information معلومات الوحدة الدراسية			
Module Title	Finite Mathematics		**Delivery Methods**
Delivery Methods	Core		☑ **Theory** ☐ **Lecture** ☐ **Laboratory** ☑ **Tutorial**
Module Code	MAT1103		
ECTS Credits	5		
Total Study Workload (Hours/Semester)	125		
Module Level	2	**Approval Date by the Scientific Committee**	
Department	Mathematics	**Semester of Delivery**	1
Personnel and Administration			
Module Leader	Dr Azhar Abbas Majeed	**College**	Science
Academic Title	Professor (PhD)	**Email**	azhar.majeed@sc.uobaghdad.edu.iq
Module Tutor		**Email**	
Peer Reviewer		**Additional Email Addresses**	
Administration Date	13th of Aug. 2024	**Version Number**	1

Relationship with Other Modules			
Prerequisite Modules	None	**Semester**	___
Co-requisite Module	None	**Semester**	___

Module Objectives, Module Learning Outcomes, and Indicative Content أهداف الوحدة الدراسية ونتائج التعلم والمحتوى الإرشادي	
Module Objectives أهداف الوحدة الدراسية	**1.** Understand Finite Mathematics: Help students grasp concepts related to non-continuous systems. **2.** Enhance Problem-Solving Skills: Teach students to address problems using combinatorics, matrices, graph theory, and logic. **3.** Real-World Applications: Show how finite mathematics is relevant in business, economics, and computer science. **4.** Promote Analytical Thinking: Foster logical and analytical thinking through structured problem-solving activities.
Module Learning Outcomes مخرجات التعلم للوحدة	**1.** Utilize Combinatorics: Solve problems using counting methods like permutations and combinations. **2.** Conduct Matrix Operations: Use matrices to solve linear equations and perform network analysis. **3.** Understand Graph Theory: Apply basic concepts of graph theory to tackle problems, such as finding the shortest paths. **4.** Implement Logic and Set Theory: Use logical reasoning and theory in effective problem-solving. **5.** Model Real-World Scenarios: Analyze and model real-life situations using tools from finite mathematics.
Indicative Content المحتوى الإرشادي	**1.** Sets and Logic: Introduction to sets, subsets, operations, and fundamental logic. **2.** Combinatorics: Important counting methods, including permutations, combinations, and their applications. **3.** Graph Theory and Algorithms: This course studies graphs, directed graphs, and shortest path algorithms and their practical uses. **4.** Matrix Algebra: Types of matrix operations, determinants, and how they relate to problem-solving. **5.** Linear Programming: Formulating linear programming problems and their applications in business contexts. **6.** Probability: Fundamental concepts of probability theory and its role in decision-making. **7.** Finance and Economics: This course overviews financial mathematics, including interest calculations, annuities, and amortization.

Learning and Teaching Strategies استراتيجيات التعلم والتدريس	
Strategies	**7.** Lectures on Effective Time Management • Conduct structured sessions emphasizing time management's critical role in academic and professional settings. These sessions will explore proven strategies for enhancing personal productivity, including task prioritization, overcoming procrastination, and using practical time-tracking tools. **8.** Collaborative Group Work

	• Implement group-based assignments to strengthen teamwork, communication, and collective problem-solving abilities. By promoting peer collaboration, the program enhances understanding and cultivates a shared commitment to achieving educational objectives. **9.** Integration of Accessible Online Resources • Leverage user-friendly digital platforms and online courses to support ongoing skill development and reinforce course content. Provide access to a wide range of learning materials, ensuring flexible, independent learning and continuous engagement beyond the traditional classroom environment.

Student Workload (SWL) **الحمل الدراسي للطلاب لمدة 15 أسبوعًا**			
Structured SWL (hours/semester) **الحمل الدراسي المنتظم للطالب خلال الفصل**	63	**Structured Study Workload (hours/week)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	4.2
Unstructured SWL (hours/semester) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	62	**Unstructured Study Workload (hours/week)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	4.1
Total SWL (hours/semester) **الحمل الدراسي الكلي للطالب خلال الفصل**	125		

Module Evaluation **تقييم الوحدة الدراسية**					
		Time/Number	**Weight (Marks)**	**Weekly Due**	**Relevant Learning Outcomes**
Assessment Methods include	**Quizzes**	4	16%	5, 10	4
	Assignments	4	16%	3, 14	4
	Projects/Laboratories	___	___	___	___
	Reports	2	8%	___	2
Summative Assessments	**Midterm Examination**	2 hours	10%	7	2 hours
	Final Examination	3 hours	50%	17	3 hours
Total Assessment		100%			

Weekly Syllabus Delivery Plan منهج أسبوعي نظري لخطة التسليم	
Week	**Material Covered**
Week 1	Permutations, Combinations, and the Binomial Theorem • An introduction to permutations and combinations aimed at improving problem-solving skills in counting and applying the binomial theorem.
Week 2	Sets and Set Operations • A study of sets, their operations, and how to determine the size of finite sets.
Week 3	Introduction to Systems of Linear Equations • A basic overview of systems of linear equations, including key concepts and methods for formulating them, supported by examples.
Week 4	Elementary Row Operations • Learning how to use elementary row operations to solve equations.
Week 5	Gauss-Jordan Elimination • An exploration of the Gauss-Jordan elimination method for effectively solving linear equations.
Week 6	Matrix Algebra • Examining matrix operations, such as multiplication and finding the inverses of square matrices.
Week 7	Mid-term Examination and Discussion • A mid-term exam evaluates knowledge from Weeks 1 to 6 and discusses the essential concepts.
Week 8	Descriptive Statistics • An introduction to descriptive statistics emphasizing measures of central tendency and variability.
Week 9	Introduction to Probability • Fundamental concepts of probability, discussing probability spaces and the basic axioms.
Week 10	Calculating Probabilities of Events • Methods for calculating the probabilities of various events.
Week 11	Conditional Probability and Independence • A study of conditional probability and independence, along with their practical applications.
Week 12	Tree Diagrams with Applications • Tree diagrams are used to solve probability problems and represent outcomes.
Week 13	Bayes' Theorem with Applications • A detailed exploration of Bayes' theorem, focusing on how to update probabilities based on new information.
Week 14	Statistical Distributions • A summary of critical statistical distributions and their significance in data analysis.
Week 15	Comprehensive Review • A thorough review of all topics covered in the course to prepare for the final exam.

Week 16	Final Examination

Resources for Teaching and Learning **الموارد المخصصة للتدريس والتعلم**		
	Resource Availability	**Library Resource Availability**
Required Texts	*Sullivan, M., 2010. Finite mathematics: an applied approach. John Wiley & Sons.*	Yes
Recommended Texts	The central library, science library, and departmental repository house vital texts and distinctive resources related to Finite Mathematics.	Yes
Websites	– Specialized academic websites. – Virtual library services provide resources that are accessible from international university libraries.	

Grading Scheme **مخطط الدرجات**				
Assessment Groups and Corresponding Grades	**Grade**		**Marks (%)**	**Definition**
Success Group (50–100)	**Grade A**	Excellent	90–100	Outstanding Performance
	Grade B	Very Good	80–89	Above-Average Performance with Minor Errors
	Grade C	Good	70–79	Acceptable Work with Noticeable Errors
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Fail Group (0–49)	**Grade FX**	Fail	45–49	Additional Work Required; Credit Awarded
	Grade F	Fail	0–44	Substantial Improvement Needed

Important Note on Grade Rounding: In line with our commitment to fair academic assessment, all decimal grades will be rounded to the nearest whole number. For example, a grade of 54.5 will be rounded to 55, whereas 54.4 will be rounded to 54. Any modifications to the grades initially assigned by evaluators will strictly follow this automated rounding process.

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Module Description Form

نموذج وصف الوحدة الدراسية

Module Information معلومات الوحدة الدراسية			
Module Title	Computer Skill 1		**Delivery Methods**
Delivery Methods	Basic		☑ Theory ☐ Lecture ☑ Laboratory ☐ Tutorial
Module Code	UOB103		
ECTS Credits	3		
Total Study Workload (Hours/Semester)	75		
Module Level	2	**Approval Date by the Scientific Committee**	
Department	Mathematics	**Semester of Delivery**	1
Personnel and Administration			
Module Leader	Dr Imad Jasim Mohammed	**College**	Science
Academic Title	Lecturer (PhD)	**Email**	emad.j@sc.uobaghdad.edu.iq
Module Tutor		**Email**	
Peer Reviewer		**Additional Email Addresses**	

Administration Date	13th of Aug. 2024	**Version Number**	1

Relationship with Other Modules			
Prerequisite Modules	None	**Semester**	___
Co-requisite Module	None	**Semester**	___

Module Objectives, Module Learning Outcomes, and Indicative Content **أهداف الوحدة الدراسية ونتائج التعلم والمحتوى الإرشادي**	
Module Objectives **أهداف الوحدة الدراسية**	**1.** Basic Computer Skills: Teach essential computer skills necessary for success in mathematics and related disciplines. **2.** Introduction to Programming: Cover fundamental programming concepts vital for solving mathematical problems. **3.** Familiarity with Mathematical Software: Introduce standard mathematical software in academic and industry settings. **4.** Data Management Skills: Students should be able to manage, analyze, and present data effectively.
Module Learning Outcomes **مخرجات التعلم للوحدة**	**1.** Computer Literacy: Students should be able to navigate computer systems, manage files, and use productivity software such as word processors and spreadsheets. **2.** Write Simple Programs: Develop basic scripts in programming languages like Python or MATLAB to solve mathematical problems. **3.** Utilize Mathematical Software: Use tools like MATLAB or R for advanced calculations and visual data representation. **4.** Data Management: Implement data managing skills, including data entry, manipulation, and visualization using spreadsheets or statistical software.
Indicative Content **المحتوى الإرشادي**	**1.** Understanding Computer Basics: Introduction to hardware, software, operating systems, and troubleshooting techniques. **2.** Programming Fundamentals: This course provides an overview of programming in Python, covering variables, data types, control structures, and basic data structures. **3.** Introduction to Mathematical Software: Tutorials on using software such as MATLAB to model and visualize data. **4.** Data Management and Visualization Techniques: Utilizing spreadsheets for data handling and creating visual charts. **5.** Productivity Software Training: Instruction using word processors, spreadsheets, presentation software, and database management basics. **6.** Internet Research and Study Skills: This course covers practical strategies for Internet research, the basics of digital security, and an introduction to academic databases and citation tools.

Learning and Teaching Strategies **استراتيجيات التعلم والتدريس**	
Strategies	**10.** Lectures on Effective Time Management

	• Conduct structured sessions emphasizing time management's critical role in academic and professional settings. These sessions will explore proven strategies for enhancing personal productivity, including task prioritization, overcoming procrastination, and using practical time-tracking tools. **11.** Collaborative Group Work • Implement group-based assignments to strengthen teamwork, communication, and collective problem-solving abilities. By promoting peer collaboration, the program enhances understanding and cultivates a shared commitment to achieving educational objectives. **12.** Integration of Accessible Online Resources • Leverage user-friendly digital platforms and online courses to support ongoing skill development and reinforce course content. Provide access to a wide range of learning materials, ensuring flexible, independent learning and continuous engagement beyond the traditional classroom environment.

Student Workload (SWL) **الحمل الدراسي للطلاب لمدة 15 أسبوعًا**			
Structured SWL (hours/semester) **الحمل الدراسي المنتظم للطالب خلال الفصل**	49	**Structured Study Workload (hours/week)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	3.0
Unstructured SWL (hours/semester) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	26	**Unstructured Study Workload (hours/week)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	2.0
Total SWL (hours/semester) **الحمل الدراسي الكلي للطالب خلال الفصل**	75		

Module Evaluation **تقييم الوحدة الدراسية**					
		Time/Number	**Weight (Marks)**	**Weekly Due**	**Relevant Learning Outcomes**
Assessment Methods include	**Quizzes**	4	16%	5, 10	4
	Assignments	4	16%	3, 14	4
	Projects/Laboratories	___	___	___	___
	Reports	2	8%	___	2
Summative Assessments	**Midterm Examination**	2 hours	10%	7	2 hours
	Final Examination	3 hours	50%	17	3 hours

Total Assessment	100%		

Weekly Syllabus Delivery Plan **منهج أسبوعي نظري لخطة التسليم**	
Week	**Material Covered**
Week 1	Computer Basics • Learn about computer components, including input, storage, memory, and output, and how they are used in real life. • Get an overview of the ALU, CU, and CPU functions. • Understand the basics of representing data in binary format.
Week 2	Memory and I/O Devices • Study different types of memory, such as RAM, ROM, and secondary storage, such as HDDs, flash drives, and optical media. • Analyze input/output devices such as keyboards, mice, LCDs, and printers. • Explore trends in the development of I/O devices.
Week 3	MS Windows • Explore the desktop environment and learn how to manage files using Windows Explorer. • Understand how to configure settings in the Control Panel and retrieve files.
Week 4	MS Word (Part I) • Introduction to the MS Word interface and its features. • Learn how to create, edit, and save documents and text formatting techniques.
Week 5	MS Word (Part II) • Master advanced text manipulation, including find/replace, bullet points, headers/footers, and table properties. • Utilize proofreading tools such as spell check, grammar check, and thesaurus.
Week 6	MS Word (Part III) • Learn how to insert graphics and adjust page size/margins for printing. • Get an introduction to mail merge functionality with practical exercises.
Week 7	Midterm Examination • An assessment covering Weeks 1–6 material, followed by a review if necessary.
Week 8	MS Excel (Part I) • Get familiar with creating and saving Excel workbooks, formatting cells, and using essential functions.
Week 9	MS Excel (Part II) • Learn how to construct formulas and create charts; understand spreadsheet printing guidelines.
Week 10	MS PowerPoint (Part I) • Overview of how to create and edit presentations using templates.
Week 11	MS PowerPoint (Part II) • Explore different view modes, create custom templates, and add graphics. • Learn tips for printing slides efficiently.

Week 12	Internet Basics • Introduction to key internet terms (web page, browser, URL) and basic navigation within a browser.
Week 13	Web Server Applications • Understand core services like the World Wide Web, email, instant messaging, and video conferencing. • Analyze the features of a web browser.
Week 14	Computer Ethics and Societal Impact • Overview of computer ethics and public perspectives on technology use. • Discuss topics such as privacy, intellectual property, and the societal implications of technology.
Week 15	Final Examination Preparation • Review all course materials and clarify important concepts.
Week 16	Final Examination • A comprehensive assessment covering all topics discussed in the course.

Weekly Syllabus Delivery Plan **منهج أسبوعي عملي لخطة التسليم**	
Week	**Material Covered**
Week 1	Computer Fundamentals • Characteristics of computers and an overview of their architecture (input, storage, memory, output). • Functions of the Arithmetic Logic Unit (ALU) and Control Unit (CU). • Understanding the Central Processing Unit (CPU). • Introduction to Binary Data Representation.
Week 2	Memory and I/O Devices • Different types of memory: RAM, ROM, and secondary storage (HDD, flash drives, optical disks). • Overview of Input/Output devices (keyboard, mouse, printers, etc.). • Current trends in I/O devices.
Week 3	MS Windows • Navigating the desktop, using My Computer, and file management with Windows Explorer. • Configuring Control Panel settings and searching for files.
Week 4	MS Word (Part I) • Understanding the MS Word interface and its helpful features. • Techniques for creating, editing, and saving documents. • Text formatting and alignment.
Week 5	MS Word (Part II) • Advanced text features like find/replace and bullet lists. • Managing headers, footers, and tables. • Using proofreading tools such as spell check, grammar check, and thesaurus.
Week 6	MS Word (Part III)

	• Inserting images and WordArt. • Adjusting page size and margins. • Introduction to mail mergers, with practical exercises.
Week 7	Midterm Examination • Covers material from Weeks 1 to 6. • Opportunity for review and discussion as needed.
Week 8	MS Excel (Part I) • Familiar with the Excel user interface and workbook management. • Defining cell ranges and formatting options. • Introduction to essential functions (mathematical and logical) and using AutoSum.
Week 9	MS Excel (Part II) • Developing formulas and creating charts. • Overview of different chart types. • Printing settings for spreadsheets.
Week 10	MS PowerPoint (Part I) • Overview of PowerPoint for creating and editing presentations. • Utilizing AutoContent Wizard and templates.
Week 11	MS PowerPoint (Part II) • Understanding different view modes (Normal, Slide Show). • Creating custom templates and format presentations. • Adding graphics and printing slides.
Week 12	Internet Basics • Key internet terms (web page, browser, URL). • Basics of navigating a browser.
Week 13	Web Server Applications • Core services like the World Wide Web (WWW), email, and instant messaging. • Features of a web browser.
Week 14	Computer Ethics and Societal Impact • Exploring computer ethics. • Societal perspectives on technology usage. • Topics related to privacy and intellectual property.
Week 15	Final Examination Preparation • Reviewing course content with practical exercises. • The final Q&A session focused on key concepts.
Week 16	Final Examination • A comprehensive assessment covering all topics discussed in the course.

Resources for Teaching and Learning

الموارد المخصصة للتدريس والتعلم

	Resource Availability	Library Resource Availability
Required Texts	*Wang, W., 2016. Absolute Beginners Guide to Computing. Après.* *Miller, M., 2009. Absolute beginner's guide to computer basics. Pearson Education.*	Yes
Recommended Texts	The central library, science library, and departmental repository contain the most critical texts and distinctive resources on computer skills.	Yes
Websites	– Specialized academic websites. – Virtual library services provide resources that are accessible from international university libraries.	

Grading Scheme

مخطط الدرجات

Assessment Groups and Corresponding Grades	Grade		Marks (%)	Definition
Success Group (50–100)	**Grade A**	Excellent	90–100	Outstanding Performance
	Grade B	Very Good	80–89	Above-Average Performance with Minor Errors
	Grade C	Good	70–79	Acceptable Work with Noticeable Errors
	Grade D	Satisfactory	60–69	Satisfactory – Fair Performance with Significant Shortcomings
	Grade E	Sufficient	50–59	Meets Minimum Requirements
Fail Group (0–49)	**Grade FX**	Fail	45–49	Additional Work Required; Credit Awarded
	Grade F	Fail	0–44	Substantial Improvement Needed

Important Note on Grade Rounding: In line with our commitment to fair academic assessment, all decimal grades will be rounded to the nearest whole number. For example, a grade of 54.5 will be rounded to 55, whereas 54.4 will be rounded to 54. Any modifications to the grades initially assigned by evaluators will strictly follow this automated rounding process.

Ministry of Higher Education and Scientific Research
University of Baghdad
College of Science
Department of Mathematics

Module Description Form

نموذج وصف الوحدة الدراسية

Module Information معلومات الوحدة الدراسية			
Module Title	**Calculus 1**		**Delivery Methods**
Delivery Methods	Core		☑ **Theory** ☐ **Lecture** ☐ **Laboratory** ☑ **Tutorial**
Module Code	MAT1101		
ECTS Credits	8		
Total Study Workload (Hours/Semester)	200		
Module Level	2	**Approval Date by the Scientific Committee**	
Department	Mathematics	**Semester of Delivery**	1
Personnel and Administration			
Module Leader	Dr Shireen Rasool Jawad	**College**	Science
Academic Title	Assistant Professor (PhD)	**Email**	shireen.jawad@sc.uobaghdad.edu.iq
Module Tutor	Dr Seema Abdulsattar Mohammed	**Email**	Seemaa.a@sc.uobaghdad.edu.iq
Peer Reviewer		**Additional Email Addresses**	
Administration Date	13th of Aug. 2024	**Version Number**	1

Relationship with Other Modules			
Prerequisite Modules	None	**Semester**	___
Co-requisite Module	None	**Semester**	___

Module Objectives, Module Learning Outcomes, and Indicative Content أهداف الوحدة الدراسية ونتائج التعلم والمحتوى الإرشادي	
Module Objectives أهداف الوحدة الدراسية	**1.** Basic Calculus Concepts: Introduce limits, derivatives, and integrals. **2.** Problem-Solving Skills: Teach students how to use differential and integral calculus to solve problems. **3.** Real-World Applications: Demonstrate how calculus is used in physics, engineering, and economics. **4.** Preparation for Advanced Mathematics: Prepare students for more advanced math courses.
Module Learning Outcomes مخرجات التعلم للوحدة	**1.** Limit Calculation: Compute limits and interpret the behavior of functions. **2.** Differentiation: Determine rates of change and solve optimization problems. **3.** Integration: Employ methods for calculating areas under curves and solving simple differential equations. **4.** Mathematical Writing: Clearly express mathematical concepts in writing. **5.** Critical Thinking: Analyze complex problems using calculus.
Indicative Content المحتوى الإرشادي	**1.** Introduction to Calculus: Overview of its history and real-life applications. **2.** Understanding Limits and Continuity: Learn to evaluate limits and grasp continuity. **3.** Differentiation Methods: Explore product, quotient, and chain rules. **4.** Using Derivatives: Identify critical points, perform optimization, and analyze curves. **5.** Integration Methods: Cover substitution, integration by parts, and basic integral calculations. **6.** Fundamental Theorem of Calculus: Understand the relationship between differentiation and integration for calculating areas. **7.** Applications of Integration: Calculate areas between curves and explore physical applications. **8.** Introduction to Differential Equations: Learn the basics of solving simple differential equations for modelling purposes.

Learning and Teaching Strategies استراتيجيات التعلم والتدريس	
Strategies	**13.** Lectures on Effective Time Management • Conduct structured sessions emphasizing time management's critical role in academic and professional settings. These sessions will explore proven strategies for enhancing personal productivity, including task prioritization, overcoming procrastination, and using practical time-tracking tools. **14.** Collaborative Group Work • Implement group-based assignments to strengthen teamwork, communication, and collective problem-solving abilities. By promoting peer collaboration, the program enhances understanding and cultivates a shared commitment to achieving educational objectives. **15.** Integration of Accessible Online Resources • Leverage user-friendly digital platforms and online courses to support ongoing skill development and reinforce course content. Provide access to a wide range of learning materials, ensuring flexible, independent learning and continuous engagement beyond the traditional classroom environment.

Student Workload (SWL) الحمل الدراسي للطلاب لمدة 15 أسبوعًا			
Structured SWL (hours/semester) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured Study Workload (hours/week)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (hours/semester) الحمل الدراسي غير المنتظم للطالب خلال الفصل	137	**Unstructured Study Workload (hours/week)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	9.1
Total SWL (hours/semester) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم الوحدة الدراسية					
		Time/Number	**Weight (Marks)**	**Weekly Due**	**Relevant Learning Outcomes**
Assessment Methods include	**Quizzes**	4	16%	5, 10	4
	Assignments	4	16%	3, 14	4
	Projects/Laboratories	___	___	___	___
	Reports	2	8%	___	2
Summative Assessments	**Midterm Examination**	2 hours	10%	7	2 hours
	Final Examination	3 hours	50%	17	3 hours
Total Assessment		100%			

Weekly Syllabus Delivery Plan منهج أسبوعي لخطة التسليم	
Week	**Material Covered**
Week 1	Fundamental Number Theory and Inequalities

	• Overview of the properties of real numbers and principles of inequalities.
Week 2	Intervals and Absolute Values • Study of interval notation and absolute values, as well as strategies for solving inequality problems.
Week 3	Coordinate Geometry and Inclination • Application of the Cartesian coordinate system and concepts of angle inclination in geometry.
Week 4	Functions • Definition, classification, and operations involving functions, including their domain and range.
Week 5	Properties of Limits • Examination of limits, basic limit laws, and their applications.
Week 6	Continuity • Analysis of function continuity and criteria for assessing it.
Week 7	Mid-Term Examination and Discussion • Evaluation of material from Weeks 1 to 6 and a review session.
Week 8	Trigonometric Functions • Overview of trigonometric functions, their identities, and applications.
Week 9	Derivative Rules • Review differentiation rules for polynomials, exponential, and logarithmic functions.
Week 10	Trigonometric Derivatives • Exploration of differentiation rules for trigonometric functions and their inverses.
Week 11	Applications of Derivatives • Introduction to L'Hôpital's Rule, understanding increasing and decreasing functions, and concavity.
Week 12	Extreme Value and Mean Value Theorems • Discussion of essential calculus theorems related to real-world optimization.
Week 13	Integration • Overview of fundamental principles and techniques of integration.
Week 14	The First Fundamental Theorem of Calculus • An explanation of the relationship between integrals and derivatives is illustrated with examples.
Week 15	Review • Comprehensive review of all topics in preparation for the end-of-term assessment.
Week 16	Final Examination • A comprehensive assessment covering all topics from the course.

Resources for Teaching and Learning **الموارد المخصصة للتدريس والتعلم**		
	Resource Availability	**Library Resource Availability**

Required Texts	*Weir, M.D., Hass, J., and Giordano, F.R., 2005. Thomas' Calculus. Pearson Education India.*	Yes
Recommended Texts	The Central Library, the Science Library, and the Departmental Repository offer a comprehensive collection of fundamental texts and specialized resources in calculus.	Yes
Websites	– Specialized academic websites. – Virtual library services provide resources that are accessible from international university libraries.	

Grading Scheme

مخطط الدرجات

Assessment Groups and Corresponding Grades	Grade		Marks (%)	Definition
Success Group (50–100)	**Grade A**	Excellent	90–100	Outstanding Performance
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Module Description Form

نموذج وصف الوحدة الدراسية

Module Information معلومات الوحدة الدراسية			
Module Title	Arabic Language 1		**Delivery Methods**
Delivery Methods	Suplement		☑ **Theory** ☐ **Lecture** ☐ **Laboratory** ☐ **Tutorial**
Module Code	UOB101		
ECTS Credits	2		
Total Study Workload (Hours/Semester)	50		
Module Level	2	**Approval Date by the Scientific Committee**	
Department	Mathematics	**Semester of Delivery**	1
Personnel and Administration			
Module Leader	Dr Leqaa Faleh Owdaa	**College**	Science
Academic Title	Lecturer (PhD)	**Email**	leqaa.falih@ircoedu.uobaghdad.edu.iq
Module Tutor		**Email**	
Peer Reviewer		**Additional Email Addresses**	
Administration Date	13th of Aug. 2024	**Version Number**	1

Relationship with Other Modules			
Prerequisite Modules	None	**Semester**	___
Co-requisite Module	None	**Semester**	___

Module Objectives, Module Learning Outcomes, and Indicative Content

أهداف الوحدة الدراسية ونتائج التعلم والمحتوى الإرشادي	
Module Objectives **أهداف الوحدة الدراسية**	1. تقديم مهارات اللغة العربية الأساسية: تزويد الطلاب بالمهارات الأساسية في اللغة العربية الفصحى، مع التركيز على القراءة والكتابة والاستماع والتحدث. 2. تعزيز الوعي الثقافي: تقديم رؤى حول الثقافة العربية، والتي تعتبر ضرورية لفهم السياق الذي تُستخدم فيه اللغة. 3. تطوير قدرات التواصل: تطوير مهارات التواصل الأساسية اللازمة للتفاعلات اليومية في البيئات الناطقة بالعربية. 4. وضع الأساس للدراسة المتقدمة: إعداد الطلاب لمزيد من الاستكشاف الأكاديمي في اللغة والأدب العربي.
Module Learning Outcomes **مخرجات التعلم للوحدة**	1. قراءة وكتابة الخط العربي: التعرف على الأبجدية العربية وكتابتها بدقة والمفردات الأساسية. 2. فهم القواعد والمفردات الأساسية: إدراك الجوانب الأساسية لقواعد اللغة العربية، بما في ذلك تركيب الجمل والأفعال والقواعد النحوية الأساسية. 3. المشاركة في محادثات بسيطة: المشاركة في محادثات تشمل التحيات والتعارف وغيرها من التفاعلات اليومية. 4. تقدير السياق الثقافي: إظهار فهم للمعايير والممارسات الثقافية الرئيسية في البلدان الناطقة بالعربية، مما يعزز فهم اللغة والتطبيق العملي. 5. تطبيق مهارات اللغة في سياقات عملية: استخدام مهارات اللغة العربية في سياقات عملية، بما في ذلك قراءة نصوص بسيطة وكتابة جمل أساسية وفهم العربية المحكية في سياقات مألوفة.
Indicative Content **المحتوى الإرشادي**	1. مقدمة في اللغة العربية: نظرة عامة على أهمية اللغة وتاريخها ودورها في العالم الحديث. 2. الأبجدية العربية والخط: دراسة مفصلة للخط العربي، بما في ذلك أشكال الحروف في مواقع مختلفة والنطق ومهارات الكتابة الأساسية. 3. القواعد الأساسية: مقدمة في تصريف الأفعال والأسماء، الضمائر الشخصية، والصفات والظروف الشائعة. 4. المفردات الأساسية: تطوير المفردات الأساسية اللازمة للتفاعلات اليومية، بما في ذلك الأرقام، أيام الأسبوع، العبارات والتعبيرات الشائعة. 5. الاستماع والتحدث: تمارين مركزة على الاستماع وممارسة العربية المحكية من خلال الحوارات والتكرار لتحسين النطق والطلاقة. 6. الدروس الثقافية: رؤى حول العادات والتقاليد العربية والإتيكيت، مع التركيز على أهميتها في استخدام اللغة والتواصل. 7. التطبيقات العملية: فرص لاستخدام العربية في تطبيقات عملية، مثل قراءة اللافتات والقوائم والنصوص البسيطة والمشاركة في حوارات قصيرة.

Learning and Teaching Strategies استراتيجيات التعلم والتدريس	
Strategies	1. محاضرات حول إدارة الوقت بفعالية • إجراء جلسات منظمة تؤكد على الدور الحاسم لإدارة الوقت في البيئات الأكاديمية والمهنية. ستستكشف هذه الجلسات الاستراتيجيات المثبتة لتعزيز الإنتاجية الشخصية، بما في ذلك تحديد أولويات المهام، التغلب على التسويف، واستخدام أدوات تتبع الوقت العملية. 2. العمل الجماعي التعاوني • تنفيذ واجبات قائمة على العمل الجماعي لتعزيز مهارات العمل الجماعي والتواصل والقدرة على حل المشكلات بشكل جماعي. من خلال تشجيع التعاون بين الأقران، يعزز البرنامج الفهم وينمي التزامًا مشتركًا بتحقيق الأهداف التعليمية. 3. دمج الموارد الإلكترونية المتاحة • استغلال المنصات الرقمية سهلة الاستخدام والدورات عبر الإنترنت لدعم تطوير المهارات المستمر وتعزيز محتوى الدورة. توفير الوصول إلى مجموعة واسعة من المواد التعليمية، مما يضمن التعلم المستقل المرن والتفاعل المستمر خارج بيئة الفصل التقليدي.

Student Workload (SWL) الحمل الدراسي للطلاب لمدة 15 أسبوعًا			
Structured SWL (hours/semester) **الحمل الدراسي المنتظم للطالب خلال الفصل**	33	**Structured Study Workload (hours/week)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	2.0
Unstructured SWL (hours/semester)	17	**Unstructured Study Workload (hours/week)**	1.3

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (hours/semester) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم الوحدة الدراسية					
		Time/Number	Weight (Marks)	Weekly Due	Relevant Learning Outcomes
Assessment Methods include	Quizzes	4	16%	5, 10	4
	Assignments	4	16%	3, 14	4
	Projects/Laboratories	___	___	___	___
	Reports	2	8%	___	2
Summative Assessments	Midterm Examination	2 hours	10%	7	2 hours
	Final Examination	3 hours	50%	17	3 hours
Total Assessment		100%			

Weekly Syllabus Delivery Plan منهج أسبوعي نظري لخطة التسليم	
Week	Material Covered
Week 1	علامات الترقيم والتنقيط • مقدمة في قواعد علامات الترقيم والتنقيط وتطبيقاتها في اللغة العربية.
Week 2	المشتقات • استكشاف كيفية استخراج الكلمات في العربية، بما في ذلك أنماط الجذور والعمليات المورفولوجية.
Week 3	الجمل الاسمية • بنية واستخدام الجمل الاسمية في العربية.
Week 4	الجمل الفعلية • بنية واستخدام الجمل الفعلية في العربية.
Week 5	الفرق بين الضاد والظاء

	• الفروق الصوتية والإملائية بين حرفي الضاد والظاء.
Week 6	التاء المربوطة والتاء المفتوحة • الفروق واستخدامات التاء المربوطة والتاء المفتوحة.
Week 7	الامتحان النصفي • امتحان شامل يغطي المادة من الأسابيع 1-6.
Week 8	الأعداد • قواعد وتعبيرات استخدام الأعداد في العربية.
Week 9	التجميع • طرق وقواعد تكوين الجموع في العربية.
Week 10	الجمل الرئيسية والفرعية • فهم بنية ووظيفة الجمل الرئيسية والفرعية في النحو العربي.
Week 11	شخصيات عراقية: بدر شاكر السياب والجواهري • دراسة مساهمات الشخصيات الأدبية العراقية البارزة بدر شاكر السياب والجواهري.
Week 12	العطف • استخدام وأنواع العطف في العربية.
Week 13	حروف الجر • استخدام وتأثير حروف الجر في تكوين عبارات وجمل في العربية.
Week 14	الأسماء المؤنثة والمذكرة • خصائص وقواعد الأسماء المؤنثة والمذكرة.
Week 15	الحذف والزيادة • الظواهر النحوية للحذف والزيادة في بناء اللغة العربية.
Week 16	الامتحان الشامل النهائي

Resources for Teaching and Learning

الموارد المخصصة للتدريس والتعلم

	Resource Availability	Library Resource Availability
Required Texts	*جامع الدروس العربية وشرح ابن عقيل*	Yes
Recommended Texts	تحتوي المكتبة المركزية ومكتبة العلوم ومستودع الأقسام على نصوص بالغة الأهمية وموارد فريدة عن اللغة العربية.	Yes
Websites	- مواقع إلكترونية أكاديمية متخصصة. - توفر خدمات المكتبات الافتراضية مصادر يمكن الوصول إليها من مكتبات الجامعات العالمية.	

Grading Scheme

مخطط الدرجات

Assessment Groups and Corresponding Grades	Grade		Marks (%)	Definition
Success Group (50–100)	**Grade A**	Excellent	90–100	Outstanding Performance
	Grade B	Very Good	80–89	Above-Average Performance with Minor Errors
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Fail Group (0–49)	**Grade FX**	Fail	45–49	Additional Work Required; Credit Awarded
	Grade F	Fail	0–44	Substantial Improvement Needed

Important Note on Grade Rounding: In line with our commitment to fair academic assessment, all decimal grades will be rounded to the nearest whole number. For example, a grade of 54.5 will be rounded to 55, whereas 54.4 will be rounded to 54. Any modifications to the grades initially assigned by evaluators will strictly follow this automated rounding process.

Dept. Of mathematics

Level One (UGI)

Semester Two

Ministry of Higher Education and Scientific Research
University of Baghdad
College of Science
Department of Mathematics

Module Description Form

نموذج وصف الوحدة الدراسية

Module Information معلومات الوحدة الدراسية			
Module Title	**Calculus 2**		**Delivery Methods**
Delivery Methods	Core		☑ **Theory** ☐ **Lecture** ☐ **Laboratory** ☑ **Tutorial**
Module Code	MAT1215		
ECTS Credits	8		
Total Study Workload (Hours/Semester)	200		
Module Level	2	**Approval Date by the Scientific Committee**	
Department	Mathematics	**Semester of Delivery**	2
Personnel and Administration			
Module Leader	Dr Shireen Rasool Jawad	**College**	Science
Academic Title	Assistant Professor (PhD)	**Email**	shireen.jawad@sc.uobaghdad.edu.iq
Module Tutor	Dr Seema Abdulsattar Mohammed	**Email**	Seemaa.a@sc.uobaghdad.edu.iq
Peer Reviewer		**Additional Email Addresses**	
Administration Date	13th of Aug. 2024	**Version Number**	1

Relationship with Other Modules			
Prerequisite Modules	MAT1215	**Semester**	1
Co-requisite Module	None	**Semester**	___

Module Objectives, Module Learning Outcomes, and Indicative Content أهداف الوحدة الدراسية ونتائج التعلم والمحتوى الإرشادي	
Module Objectives أهداف الوحدة الدراسية	**1.** Deepen Understanding of Integral Calculus: This course expands on the basic concepts from Calculus 1 and delves into advanced integration techniques. **2.** Explore Series and Sequences: This course will equip students with the skills to analyze sequences and series regarding their convergence or divergence. **3.** Introducing Multivariable Calculus: This section presents fundamental ideas of calculus involving multiple variables, laying the groundwork for more complex systems. **4.** Apply Calculus in Various Fields: Demonstrate the relevance of calculus in disciplines such as physics, engineering, economics, and the natural sciences.
Module Learning Outcomes مخرجات التعلم للوحدة	**1.** Use Advanced Integration Techniques: Effectively apply methods such as integration by parts and partial fractions. **2.** Assess Sequences and Series: Determine whether sequences and series converge or diverge using various tests. **3.** Work with Power Series: Manipulate power series and express functions using these representations. **4.** Analyze Parametric and Polar Equations: Study and calculate the areas and lengths of curves represented in parametric and polar forms. **5.** Solve Basic Problems in Multivariable Calculus: Understand and apply partial derivatives and double integral concepts.
Indicative Content المحتوى الإرشادي	**1.** Integration Techniques: Explore various integration methods, including integration by parts and trigonometric integration. **2.** Sequences and Series: Learn the definitions, tests for convergence, and concepts of infinite series. **3.** Power Series: Study the Taylor and Maclaurin series and how they can be used for function approximation. **4.** Parametric and Polar Curves: Plot parametric curves and calculate arc lengths and areas related to real-world applications. **5.** Vectors in Space: Understand basic vector operations and geometry concerning lines and planes. **6.** Partial Derivatives: Gain insight into partial derivatives and their practical applications. **7.** Multiple Integrals: Investigate techniques for double integrals and their use in calculating volume. **8.** Practical Applications: Utilize concepts to compute work, fluid pressure, the centre of mass, and moment of inertia in real-world scenarios.

Learning and Teaching Strategies استراتيجيات التعلم والتدريس	
Strategies	**16.** Lectures on Effective Time Management • Conduct structured sessions emphasizing time management's critical role in academic and professional settings. These sessions will explore proven strategies for enhancing personal productivity, including task prioritization, overcoming procrastination, and using practical time-tracking tools.

	17. Collaborative Group Work • Implement group-based assignments to strengthen teamwork, communication, and collective problem-solving abilities. By promoting peer collaboration, the program enhances understanding and cultivates a shared commitment to achieving educational objectives. **18.** Integration of Accessible Online Resources • Leverage user-friendly digital platforms and online courses to support ongoing skill development and reinforce course content. Provide access to a wide range of learning materials, ensuring flexible, independent learning and continuous engagement beyond the traditional classroom environment.

Student Workload (SWL) **الحمل الدراسي للطلاب لمدة 15 أسبوعًا**			
Structured SWL (hours/semester) **الحمل الدراسي المنتظم للطالب خلال الفصل**	63	**Structured Study Workload (hours/week)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	4.2
Unstructured SWL (hours/semester) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	137	**Unstructured Study Workload (hours/week)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	9.1
Total SWL (hours/semester) **الحمل الدراسي الكلي للطالب خلال الفصل**	200		

Module Evaluation **تقييم الوحدة الدراسية**					
		Time/Number	**Weight (Marks)**	**Weekly Due**	**Relevant Learning Outcomes**
Assessment Methods include	**Quizzes**	4	16%	5, 10	4
	Assignments	4	16%	3, 14	4
	Projects/Laboratories	___	___	___	___
	Reports	2	8%	___	2
Summative Assessments	**Midterm Examination**	2 hours	10%	7	2 hours
	Final Examination	3 hours	50%	17	3 hours
Total Assessment		100%			

Weekly Syllabus Delivery Plan منهج أسبوعي لخطة التسليم	
Week	**Material Covered**
Week 1	Introduction to Integrals • This week, we will introduce integration concepts, terms, and practical applications of integral calculus.
Week 2	The Definite Integral • We will define the definite integral and its main properties.
Week 3	The Fundamental Theorem of Calculus and Applications • In week three, we will explore the Fundamental Theorem of Calculus, illustrating the relationship between differentiation and integration with real-world examples.
Week 4	Areas Between Curves • We will learn how to calculate the area enclosed by multiple functions.
Week 5	Areas in Polar Coordinates • This week, we will introduce polar coordinates and methods for calculating areas using polar integrals.
Week 6	Volumes and Integration by Parts • We will study techniques for finding the volumes of solids of revolution and applying integration by parts to complex integrals.
Week 7	Mid-Term Examination and Discussion • Week seven will include a Mid-Term Examination covering material from Weeks 1 to 6, followed by a review session.
Week 8	Trigonometric Integrals • We will evaluate trigonometric integrals by utilizing identities and substitutions.
Week 9	Integration Strategy • This week, we will focus on systematic methods for selecting effective integration techniques.
Week 10	Further Applications: Arc Length and Surface Area of Revolution • We will cover formulas to compute arc lengths and the surface areas of solids of revolution.
Week 11	Infinite Sequences and Series • We will investigate infinite sequences, convergence tests, and practical examples.
Week 12	The Integral Test and Estimation of Sums • This week will focus on using the integral test to determine series convergence and estimate partial sums.
Week 13	The Comparison Test • We will employ direct and limit comparison tests to analyze series convergence, providing examples.
Week 14	Applications • We will demonstrate how series and integrals are relevant in real-world situations and advanced mathematics.
Week 15	Review

	• This week, we will revisit all topics to reinforce understanding before the final assessment.
Week 16	Final Examination • A comprehensive assessment will cover all topics from the course.

Resources for Teaching and Learning **الموارد المخصصة للتدريس والتعلم**		
	Resource Availability	**Library Resource Availability**
Required Texts	*Weir, M.D., Hass, J., and Giordano, F.R., 2005. Thomas' Calculus. Pearson Education India.*	Yes
Recommended Texts	The Central Library, the Science Library, and the Departmental Repository collectively maintain a comprehensive collection of vital texts and specialized resources related to calculus.	Yes
Websites	– Specialized academic websites. – Virtual library services provide resources that are accessible from international university libraries.	

Grading Scheme **مخطط الدرجات**				
Assessment Groups and Corresponding Grades	**Grade**		**Marks (%)**	**Definition**
Success Group (50–100)	**Grade A**	Excellent	90–100	Outstanding Performance
	Grade B	Very Good	80–89	Above-Average Performance with Minor Errors
	Grade C	Good	70–79	Acceptable Work with Noticeable Errors
	Grade D	Satisfactory	60–69	Satisfactory – Fair Performance with Significant Shortcomings
	Grade E	Sufficient	50–59	Meets Minimum Requirements
Fail Group (0–49)	**Grade FX**	Fail	45–49	Additional Work Required; Credit Awarded
	Grade F	Fail	0–44	Substantial Improvement Needed
Important Note on Grade Rounding: In line with our commitment to fair academic assessment, all decimal grades will be rounded to the nearest whole number. For example, a grade of 54.5 will be rounded to 55, whereas 54.4 will be rounded to 54. Any modifications to the grades initially assigned by evaluators will strictly follow this automated rounding process.				

Ministry of Higher Education and Scientific Research
University of Baghdad
College of Science
Department of Mathematics

Module Description Form

نموذج وصف الوحدة الدراسية

Module Information معلومات الوحدة الدراسية			
Module Title	Democracy and Human Rights		**Delivery Methods**
Delivery Methods	Supplement		☑ **Theory** ☐ **Lecture** ☐ **Laboratory** ☐ **Tutorial**
Module Code	UOB104		
ECTS Credits	2		
Total Study Workload (Hours/Semester)	50		
Module Level	2	**Approval Date by the Scientific Committee**	
Department	Mathematics	**Semester of Delivery**	2
Personnel and Administration			
Module Leader	Dr Anwar Ismael Khalil	**College**	Science
Academic Title	Lecturer (PhD)	**Email**	ansam.faik@sc.uobaghdad.edu.iq
Module Tutor		**Email**	
Peer Reviewer		**Additional Email Addresses**	
Administration Date	13th of August	**Version Number**	1

Relationship with Other Modules

Prerequisite Modules	None	**Semester**	___
Co-requisite Module	None	**Semester**	___

Module Objectives, Module Learning Outcomes, and Indicative Content **أهداف الوحدة الدراسية ونتائج التعلم والمحتوى الإرشادي**	
Module Objectives **أهداف الوحدة الدراسية**	**1.** Understand the Principles of Democracy: Learn about essential democratic values such as participation, equality, freedom, and the rule of law. **2.** Explore Human Rights: Examine the development and significance of human rights across the globe. **3.** Cultivate Critical Thinking: Encourage analysis of current democratic practices and global human rights issues. **4.** Apply Quantitative Analysis: Use statistical tools to assess data on voting trends and human rights violations.
Module Learning Outcomes **مخرجات التعلم للوحدة**	**1.** Summarize Democratic Theories: Describe different models of democracy, including direct and representative democracy. **2.** Recognize Instruments of Human Rights: Identify critical human rights treaties, such as the Universal Declaration of Human Rights. **3.** Evaluate Challenges to Democracy: Analyze issues like electoral integrity and freedom of speech. **4.** Utilize Statistical Tools for Research: Apply methods to interpret data on democratic participation and human rights incidents.
Indicative Content **المحتوى الإرشادي**	**1.** Foundations of Democracy: Study the history, characteristics, and types of democratic systems. **2.** Overview of Human Rights Law: Highlight key developments in human rights law and essential organizations. **3.** Current Issues in Democracy: Discuss contemporary challenges such as populism and election manipulation. **4.** Topics in Human Rights: Address issues like gender equality and the rights of refugees. **5.** Data Analysis in Democracy: Learn techniques for evaluating electoral and polling data. **6.** Statistical Tools for Analyzing Human Rights: Introduction to software for analyzing data on human rights violations.

Learning and Teaching Strategies **استراتيجيات التعلم والتدريس**	
Strategies	**19.** Lectures on Effective Time Management • Conduct structured sessions emphasizing time management's critical role in academic and professional settings. These sessions will explore proven strategies for enhancing personal productivity, including task prioritization, overcoming procrastination, and using practical time-tracking tools. **20.** Collaborative Group Work • Implement group-based assignments to strengthen teamwork, communication, and collective problem-solving abilities. By promoting peer collaboration, the program enhances understanding and cultivates a shared commitment to achieving educational objectives. **21.** Integration of Accessible Online Resources • Leverage user-friendly digital platforms and online courses to support ongoing skill development and reinforce course content. Provide access to a wide range of learning materials, ensuring flexible, independent learning and continuous engagement beyond the traditional classroom environment.

Student Workload (SWL) الحمل الدراسي للطلاب لمدة 15 أسبوعًا			
Structured SWL (hours/semester) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured Study Workload (hours/week)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.0
Unstructured SWL (hours/semester) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured Study Workload (hours/week)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.3
Total SWL (hours/semester) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم الوحدة الدراسية					
		Time/Number	**Weight (Marks)**	**Weekly Due**	**Relevant Learning Outcomes**
Assessment Methods include	**Quizzes**	4	16%	5, 10	4
	Assignments	4	16%	3, 14	4
	Projects/Laboratories	___	___	___	___
	Reports	2	8%	___	2
Summative Assessments	**Midterm Examination**	2 hours	10%	7	2 hours
	Final Examination	3 hours	50%	17	3 hours
Total Assessment		100%			

Weekly Syllabus Delivery Plan منهج أسبوعي نظري لخطة التسليم	
Week	**Material Covered**
Week 1	Understanding Human Rights

	• This week, we will define human rights, explore their meanings, and discuss key terms like “rights” and “human,” as well as their various categories.
Week 2	Historical Development of Human Rights • We will examine how human rights have evolved through significant legal reforms, including the Urukagina Reforms, Ur-Nammu Law, and the Code of Hammurabi.
Week 3	Human Rights in Ancient Civilizations • We will analyze how ancient civilizations, such as those in India, China, Egypt, Greece, and Rome, viewed human rights.
Week 4	Human Rights in Religious Contexts • We will explore the concept of human rights as defined in major religions, particularly Judaism, Christianity, and Islam.
Week 5	Renaissance to Modern Human Rights • Students will learn about the Universal Declaration of Human Rights, which the UN adopted on the 10th of January 1948.
Week 6	NGO Promoters of Human Rights • We will examine various NGOs that advocate for human rights, such as Amnesty International and the Red Cross.
Week 7	Midterm Examination
Week 8	Administrative Corruption • We will define administrative corruption, including its types, causes, effects on human rights, and strategies to combat it.
Week 9	Introduction to Democracy • We will explore the history and essence of democracy and its relationship with individual rights, including Islamic perspectives on democracy.
Week 10	Islamic Ruler’s Specifications and Duties • We will study the qualities and responsibilities expected of an Islamic ruler, focusing on Imam Ali’s governance in Egypt, including moral integrity, knowledge, engagement, social reform, and security.
Week 11	Conditions for Democratic Success • We will discuss the essential elements needed for a thriving democracy, such as human rights, political diversity, and the rule of law.
Week 12	Components of Democracy • This week, we will cover essential components of democracy: citizenship, political participation, electoral processes, the responsibilities of members of parliament, roles of the opposition, separation of powers, and constitutional legitimacy.
Week 13	Elections and Legal Framework • We will examine elections, including their legal requirements, concepts, and the advantages and disadvantages of democracy, focusing on Iraq.
Week 14	Lobbyists and Pressure Groups • This week’s discussions will include definitions of lobbying, types of pressure groups, their methods, and the relationship between lobbying and democracy.
Week 15	Review

Week 16	Final Examination

Resources for Teaching and Learning **الموارد المخصصة للتدريس والتعلم**		
	Resource Availability	**Library Resource Availability**
Required Texts	*Martyrdom verses from the Holy Quran Mohammed Al-Tarawneh et al., International Humanitarian Law, ICRC, Amman, 2005* *Diamond Larry, Democracy: Its Development and Ways to Enhance It, translated by Fawzia Naji, Dar Al-Mamoun for Translation, Iraq, 2005.*	Yes
Recommended Texts	The central library, the science library, and the departmental repository house the essential texts and unique resources of democracy and Human Rights.	Yes
Websites	– Specialized academic websites. – Virtual library services provide resources that are accessible from international university libraries.	

Grading Scheme **مخطط الدرجات**				
Assessment Groups and Corresponding Grades	**Grade**		**Marks (%)**	**Definition**
Success Group (50–100)	**Grade A**	Excellent	90–100	Outstanding Performance
	Grade B	Very Good	80–89	Above-Average Performance with Minor Errors
	Grade C	Good	70–79	Acceptable Work with Noticeable Errors
	Grade D	Satisfactory	60–69	Satisfactory – Fair Performance with Significant Shortcomings
	Grade E	Sufficient	50–59	Meets Minimum Requirements
Fail Group (0–49)	**Grade FX**	Fail	45–49	Additional Work Required; Credit Awarded
	Grade F	Fail	0–44	Substantial Improvement Needed

Important Note on Grade Rounding: In line with our commitment to fair academic assessment, all decimal grades will be rounded to the nearest whole number. For example, a grade of 54.5 will be rounded to 55, whereas 54.4 will be rounded to 54. Any modifications to the grades initially assigned by evaluators will strictly follow this automated rounding process.

Ministry of Higher Education and Scientific Research
University of Baghdad
College of Science
Department of Mathematics

Module Description Form

نموذج وصف الوحدة الدراسية

Module Information معلومات الوحدة الدراسية			
Module Title	English Language 1		**Delivery Methods**
Delivery Methods	Supported		☑ **Theory** ☐ **Lecture** ☐ **Laboratory** ☐ **Tutorial**
Module Code	UoB102		
ECTS Credits	2		
Total Study Workload (Hours/Semester)	50		
Module Level	2	**Approval Date by the Scientific Committee**	
Department	Mathematics	**Semester of Delivery**	2
Personnel and Administration			
Module Leader	Dr Dhefaf Faisal	**College**	Science
Academic Title	Lecturer (PhD)	**Email**	faisaldhefaf0@gmail.com
Module Tutor		**Email**	

Peer Reviewer		**Additional Email Addresses**	
Administration Date	13th of Aug. 2024	**Version Number**	1

Relationship with Other Modules			
Prerequisite Modules	None	**Semester**	___
Co-requisite Module	None	**Semester**	___

Module Objectives, Module Learning Outcomes, and Indicative Content **أهداف الوحدة الدراسية ونتائج التعلم والمحتوى الإرشادي**	
Module Objectives **أهداف الوحدة الدراسية**	1. Enhance Academic English: Help students acquire essential English skills for success in scientific settings. 2. Improve Communication: Promote clarity and coherence in written and spoken academic communication. 3. Cultivate Critical Skills: Develop critical reading and writing skills to analyze and argue different texts effectively. 4. Prepare for Professional Use: Equip students for future interactions in English, such as reports, presentations, and discussions.
Module Learning Outcomes **مخرجات التعلم للوحدة**	1. Craft Structured Texts: Use proper grammar to draft clear academic essays, reports, and research papers. 2. Present Ideas Clearly: Deliver effective oral presentations on appropriate academic topics. 3. Analyze Academic Texts: Comprehend and critically assess complex texts and articles. 4. Utilize language Professionally: Use English skillfully in various professional situations, adjusting formality as needed.
Indicative Content **المحتوى الإرشادي**	1. Academic Writing: Introduction to essay structure, thesis development, argumentation, and the use of evidence. 2. Grammar and Vocabulary: A review of relevant grammar and an expansion of scientific vocabulary. 3. Reading Strategies: Techniques for improving reading comprehension, note-taking, and summarizing scholarly articles. 4. Presentation Skills: Tips for effective presentations, including using visuals and practising presentation delivery. 5. Professional Writing: Overview of professional emails, reports, and conventions in scientific documentation. 6. Listening Exercises: Activities to improve comprehension during lectures and discussions. 7. Discussion Skills: Opportunities to engage in discussions and debates to build confidence and argumentative skills.

Learning and Teaching Strategies **استراتيجيات التعلم والتدريس**

Strategies	**22.** Lectures on Effective Time Management • Conduct structured sessions emphasizing time management's critical role in academic and professional settings. These sessions will explore proven strategies for enhancing personal productivity, including task prioritization, overcoming procrastination, and using practical time-tracking tools. **23.** Collaborative Group Work • Implement group-based assignments to strengthen teamwork, communication, and collective problem-solving abilities. By promoting peer collaboration, the program enhances understanding and cultivates a shared commitment to achieving educational objectives. **24.** Integration of Accessible Online Resources • Leverage user-friendly digital platforms and online courses to support ongoing skill development and reinforce course content. Provide access to a wide range of learning materials, ensuring flexible, independent learning and continuous engagement beyond the traditional classroom environment.

Student Workload (SWL) **الحمل الدراسي للطلاب لمدة 15 أسبوعًا**			
Structured SWL (hours/semester) **الحمل الدراسي المنتظم للطالب خلال الفصل**	33	**Structured Study Workload (hours/week)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	2.2
Unstructured SWL (hours/semester) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	17	**Unstructured Study Workload (hours/week)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	1.3
Total SWL (hours/semester) **الحمل الدراسي الكلي للطالب خلال الفصل**	50		

Module Evaluation **تقييم الوحدة الدراسية**					
		Time/Number	**Weight (Marks)**	**Weekly Due**	**Relevant Learning Outcomes**
Assessment Methods include	**Quizzes**	4	16%	5, 10	4
	Assignments	4	16%	3, 14	4
	Projects/Laboratories	___	___	___	___
	Reports	2	8%	___	2
Summative Assessments	**Midterm Examination**	2 hours	10%	7	2 hours
	Final Examination	3 hours	50%	17	3 hours

Total Assessment	100%		

Weekly Syllabus Delivery Plan **منهج أسبوعي نظري لخطة التسليم**	
Week	**Material Covered**
Week 1	Introduction to English Basics • Learn the alphabet, greetings, and how to introduce yourself, including using articles.
Week 2	Personal Information • Practice asking for and providing personal details like your name and nationality. Focus on the verb “to be.”
Week 3	Daily Activities • Learn regular verbs used to describe daily routines and adverbs of frequency.
Week 4	Family and Friends • Study vocabulary related to family and friends. From sentences using possessive adjectives.
Week 5	Describing Places • Learn vocabulary for familiar places and how to give directions. Use “there is/are” to describe locations.
Week 6	Food and Drink • Acquire key vocabulary related to meals and beverages. Practice ordering food in restaurants.
Week 7	Midterm Review • Review content from Weeks 1 to 6. Evaluate progress in writing and speaking skills.
Week 8	Shopping • Learn vocabulary associated with shopping, prices, and services.
Week 9	Health • Familiarize yourself with terms for body parts, common illnesses, and phrases used during doctor’s appointments.
Week 10	Hobbies • Discuss hobbies and sports. Introduce the present continuous tense.
Week 11	Travel • Learn vocabulary related to transportation, purchasing tickets, and seeking directions.
Week 12	Past Events • Study the past simple tense to describe personal experiences.
Week 13	Future • Use “going to” to express future intentions and incorporate time expressions.
Week 14	Work Vocabulary • Learn vocabulary related to jobs and responsibilities. Discuss daily work tasks.

Week 15	Final Review • Consolidate vocabulary and skills in preparation for the final assessment.
Week 16	Final Examination

Resources for Teaching and Learning **الموارد المخصصة للتدريس والتعلم**		
	Resource Availability	**Library Resource Availability**
Required Texts	*Soars, J. and Soars, L., 2011. New Headway Plus (Special Edition ed., Elementary).*	Yes
Recommended Texts	New Headway Plus is a comprehensive, integrated skills course. Each unit is methodically structured into segments focusing on grammar, vocabulary, skills development, and practical everyday English.	Yes
Websites	– Specialized academic websites. – Virtual library services provide resources that are accessible from international university libraries.	

Grading Scheme **مخطط الدرجات**				
Assessment Groups and Corresponding Grades	**Grade**		**Marks (%)**	**Definition**
Success Group (50–100)	**Grade A**	Excellent	90–100	Outstanding Performance
	Grade B	Very Good	80–89	Above-Average Performance with Minor Errors
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Ministry of Higher Education and Scientific Research
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Department of Mathematics

Module Description Form

نموذج وصف الوحدة الدراسية

Module Information **معلومات الوحدة الدراسية**			
Module Title	**Foundation of Mathematics 2**		**Delivery Methods**
Delivery Methods	Core		☑ **Theory** ☐ **Lecture** ☐ **Laboratory** ☑ **Tutorial**
Module Code	MAT1216		
ECTS Credits	8		
Total Study Workload (Hours/Semester)	200		
Module Level	2	**Approval Date by the Scientific Committee**	
Department	Mathematics	**Semester of Delivery**	2
Personnel and Administration			
Module Leader	Dr Hassan Fadhil Ridha	**College**	Science
Academic Title	Professor (PhD)	**Email**	hassan.fadhil.r@sc.uobaghdad.edu.iq
Module Tutor	Dr Hasnaa Faisal Mohammed	**Email**	hasnaa.mohammed1103@sc.uobaghdad.edu.iq
Peer Reviewer		**Additional Email Addresses**	

Administration Date	13th of Aug. 2024	**Version Number**	1

Relationship with Other Modules			
Prerequisite Modules	MAT1102	**Semester**	1
Co-requisite Module	None	**Semester**	___

Module Objectives, Module Learning Outcomes, and Indicative Content

أهداف الوحدة الدراسية ونتائج التعلم والمحتوى الإرشادي

Module Objectives أهداف الوحدة الدراسية	**1.** Enhance Mathematical Knowledge: To deepen understanding, build on foundational concepts and introduce more advanced topics. **2.** Develop Critical Thinking Skills: Improve students' ability to tackle complex, multi-step problems. **3.** Encourage Abstract Thinking: Promote logical reasoning necessary for studying advanced mathematics. **4.** Prepare for Advanced Courses: Equip students with skills for specialized mathematical studies.
Module Learning Outcomes مخرجات التعلم للوحدة	**1.** Apply Advanced Algebra: Confidently manage complex numbers, advanced polynomials, and exponential functions. **2.** Proficiency in Geometry and Trigonometry: Utilize advanced concepts in geometry and transformations. **3.** Effective Use of Calculus: Apply integral calculus and learn about multivariable calculus. **4.** Solve Complex Problems: Use various techniques creatively to address advanced math problems. **5.** Communicate Mathematical Ideas: Clearly explain complex mathematical concepts in writing and verbally.
Indicative Content المحتوى الإرشادي	**1.** Advanced Algebra: Focus on complex numbers, the binomial theorem, and systems of equations. **2.** Sequences and Series: Study arithmetic and geometric sequences, including convergence. **3.** Advanced Geometry: Learn about the properties of circles, ellipses, hyperbolas, and spherical geometry. **4.** Higher-Level Trigonometry: Investigate trigonometric identities and inverse functions. **5.** Integral Calculus: Explore integration techniques and introductory differential equations. **6.** Multivariable Calculus: Understand the basics of partial derivatives and functions of multiple variables. **7.** Introduction to Linear Algebra: Cover vector operations and eigenvalues. **8.** Discrete Mathematics: Examine concepts in graph theory, combinatorics, and number theory.

Learning and Teaching Strategies

استراتيجيات التعلم والتدريس

Strategies	**25.** Lectures on Effective Time Management • Conduct structured sessions emphasizing time management's critical role in academic and professional settings. These sessions will explore proven strategies for enhancing personal productivity, including task prioritization, overcoming procrastination, and using practical time-tracking tools. **26.** Collaborative Group Work

	• Implement group-based assignments to strengthen teamwork, communication, and collective problem-solving abilities. By promoting peer collaboration, the program enhances understanding and cultivates a shared commitment to achieving educational objectives. **27.** Integration of Accessible Online Resources • Leverage user-friendly digital platforms and online courses to support ongoing skill development and reinforce course content. Provide access to a wide range of learning materials, ensuring flexible, independent learning and continuous engagement beyond the traditional classroom environment.

Student Workload (SWL) **الحمل الدراسي للطلاب لمدة 15 أسبوعًا**			
Structured SWL (hours/semester) **الحمل الدراسي المنتظم للطالب خلال الفصل**	63	**Structured Study Workload (hours/week)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	4.0
Unstructured SWL (hours/semester) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	137	**Unstructured Study Workload (hours/week)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	9.3
Total SWL (hours/semester) **الحمل الدراسي الكلي للطالب خلال الفصل**	200		

Module Evaluation **تقييم الوحدة الدراسية**					
		Time/Number	**Weight (Marks)**	**Weekly Due**	**Relevant Learning Outcomes**
Assessment Methods include	**Quizzes**	4	16%	5, 10	4
	Assignments	4	16%	3, 14	4
	Projects/Laboratories	___	___	___	___
	Reports	2	8%	___	2
Summative Assessments	**Midterm Examination**	2 hours	10%	7	2 hours
	Final Examination	3 hours	50%	17	3 hours
Total Assessment		100%			

Weekly Syllabus Delivery Plan منهج أسبوعي نظري لخطة التسليم	
Week	**Material Covered**
Week 1	Operations with Cardinal Numbers • Learn about addition and multiplication techniques for cardinal numbers.
Week 2	Peano's Axioms and Real Numbers • An introduction to Peano's axioms and their relevance to the number system.
Week 3	Understanding the Quotient Algorithm • Study the quotient algorithm and its mathematical significance.
Week 4	Properties of Rational Numbers • Examine the characteristics of rational numbers and what they mean.
Week 5	Introduction to Complex Numbers • Learn the basic concepts and structures of complex numbers.
Week 6	Review of Key Concepts • A review of essential topics covered in Weeks 1 to 5.
Week 7	Mid-term Exam and Discussion • Take the mid-term exam and engage in a discussion to reinforce understanding.
Week 8	The Argument of Complex Numbers • Explore the argument of complex numbers and their practical applications.
Week 9	Lagrange's Theorem • Study Lagrange's theorem and its uses in mathematics.
Week 10	Operations on Integer Sets • Investigate how operations work with sets of integers.
Week 11	Finite Fields in Algebra • Learn about finite fields and their key properties.
Week 12	Embedding Real Numbers • Explore techniques for incorporating real numbers into different systems.
Week 13	Classifying Polynomials • Examine different types of polynomials and their attributes.
Week 14	Higher-Degree Polynomials • Analyze higher-degree polynomials and their importance in mathematics.
Week 15	Comprehensive Course Review • A thorough review of all course materials in preparation for the exam.
Week 16	Final Examination

Resources for Teaching and Learning الموارد المخصصة للتدريس والتعلم		
	Resource Availability	**Library Resource Availability**
Required Texts	*Eves, H., 1997. Foundations and Fundamental Concepts of Mathematics. Dover Publications.* *Kurtz, D.C., 1992. Foundations of abstract mathematics.*	Yes
Recommended Texts	The central library, science library, and departmental repository contain essential texts and unique resources of the Foundation of Mathematics.	Yes
Websites	– Specialized academic websites. – Virtual library services provide resources that are accessible from international university libraries.	

Grading Scheme مخطط الدرجات				
Assessment Groups and Corresponding Grades	**Grade**		**Marks (%)**	**Definition**
Success Group (50–100)	**Grade A**	Excellent	90–100	Outstanding Performance
	Grade B	Very Good	80–89	Above-Average Performance with Minor Errors
	Grade C	Good	70–79	Acceptable Work with Noticeable Errors
	Grade D	Satisfactory	60–69	Satisfactory – Fair Performance with Significant Shortcomings
	Grade E	Sufficient	50–59	Meets Minimum Requirements
Fail Group (0–49)	**Grade FX**	Fail	45–49	Additional Work Required; Credit Awarded
	Grade F	Fail	0–44	Substantial Improvement Needed

Important Note on Grade Rounding: In line with our commitment to fair academic assessment, all decimal grades will be rounded to the nearest whole number. For example, a grade of 54.5 will be rounded to 55, whereas 54.4 will be rounded to 54. Any modifications to the grades initially assigned by evaluators will strictly follow this automated rounding process.

Ministry of Higher Education and Scientific Research
University of Baghdad
College of Science
Department of Mathematics

Module Description Form

نموذج وصف الوحدة الدراسية

Module Information معلومات الوحدة الدراسية			
Module Title	Mathematical Physics 2		**Delivery Methods**
Delivery Methods	Core		☑ **Theory** ☐ **Lecture** ☐ **Laboratory** ☑ **Tutorial**
Module Code	MAT1217		
ECTS Credits	4		
Total Study Workload (Hours/Semester)	100		
Module Level	2	**Approval Date by the Scientific Committee**	

Department	Mathematics	**Semester of Delivery**	1
Personnel and Administration			
Module Leader	Dr Dahlia Khaled Bahlool	**College**	Science
Academic Title	Assistant Professor (PhD)	**Email**	dahlia.khaled@sc.uobaghdad.edu.iq
Module Tutor		**Email**	
Peer Reviewer		**Additional Email Addresses**	
Administration Date	13th of Aug. 2024	**Version Number**	1

Relationship with Other Modules			
Prerequisite Modules	MAT1104	**Semester**	1
Co-requisite Module	None	**Semester**	___

Module Objectives, Module Learning Outcomes, and Indicative Content **أهداف الوحدة الدراسية ونتائج التعلم والمحتوى الإرشادي**	
Module Objectives **أهداف الوحدة الدراسية**	1. Enhance Knowledge of Classical Physics: Study electromagnetism, thermodynamics, and fluid dynamics to expand on concepts learned in Physics 1. 2. Develop Problem-Solving Skills: This goal is to improve students' ability to tackle complex physical problems using analytical and numerical approaches. 3. Introduce Fundamentals of Modern Physics: Lay the groundwork in quantum mechanics and relativity for further study in advanced topics. 4. Strengthen Experimental Skills: Gain hands-on experience through advanced experiments and data analysis.
Module Learning Outcomes **مخرجات التعلم للوحدة**	1. Solve Problems in Electromagnetism: Address challenges related to electric and magnetic fields and waves. 2. Apply Thermodynamic Laws: Explain thermodynamic principles in real-world scenarios, such as heat engines. 3. Analyze Fluid Dynamics: Examine fluid flow and pressure-related problems. 4. Design and Implement Experiments: Create and execute experiments in electromagnetism and thermodynamics, including analyzing the results. 5. Comprehend Modern Physics: Describe core concepts in quantum mechanics and special relativity.
Indicative Content **المحتوى الإرشادي**	1. Electrostatics: Understand charge, Coulomb's law, electric fields, and Gauss's law. 2. Circuits and Electromagnetism: Study current, resistance, capacitors, and the principles of electromagnetic induction.

	3. Thermodynamics: Learn the laws of thermodynamics, the concept of entropy, and engine applications. **4.** Fluid Mechanics: Explore fluid properties, viscosity, and different types of flow. **5.** Waves and Optics: Examine the characteristics of waves and the behaviour of light. **6.** Introduction to Modern Physics: This course provides an overview of basic concepts in quantum physics and atomic models. **7.** Advanced Experimental Techniques: Learn sophisticated laboratory methods for electromagnetism and data analysis.

Learning and Teaching Strategies **استراتيجيات التعلم والتدريس**	
Strategies	**28.** Lectures on Effective Time Management • Conduct structured sessions emphasizing time management's critical role in academic and professional settings. These sessions will explore proven strategies for enhancing personal productivity, including task prioritization, overcoming procrastination, and using practical time-tracking tools. **29.** Collaborative Group Work • Implement group-based assignments to strengthen teamwork, communication, and collective problem-solving abilities. By promoting peer collaboration, the program enhances understanding and cultivates a shared commitment to achieving educational objectives. **30.** Integration of Accessible Online Resources • Leverage user-friendly digital platforms and online courses to support ongoing skill development and reinforce course content. Provide access to a wide range of learning materials, ensuring flexible, independent learning and continuous engagement beyond the traditional classroom environment.

Student Workload (SWL) **الحمل الدراسي للطلاب لمدة 15 أسبوعًا**			
Structured SWL (hours/semester) **الحمل الدراسي المنتظم للطالب خلال الفصل**	63	**Structured Study Workload (hours/week)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	4.0
Unstructured SWL (hours/semester) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	37	**Unstructured Study Workload (hours/week)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	2.6
Total SWL (hours/semester) **الحمل الدراسي الكلي للطالب خلال الفصل**	100		

Module Evaluation **تقييم الوحدة الدراسية**				
	Time/Number	**Weight (Marks)**	**Weekly Due**	**Relevant Learning Outcomes**

Assessment Methods include	**Quizzes**	4	16%	5, 10	4
	Assignments	4	16%	3, 14	4
	Projects/Laboratories	___	___	___	___
	Reports	2	8%	___	2
Summative Assessments	**Midterm Examination**	2 hours	10%	7	2 hours
	Final Examination	3 hours	50%	17	3 hours
Total Assessment		100%			

Weekly Syllabus Delivery Plan **منهج أسبوعي نظري لخطة التسليم**	
Week	**Material Covered**
Week 1	Periodic Motion and Hooke's Law • Introduction to the concepts of periodic motion and the principles of Hooke's Law.
Week 2	Applications of Hooke's Law • Overview of how Hooke's Law is applied in physics and engineering fields.
Week 3	Types of Waves • Examination of different types of waves, including their properties and behaviours.
Week 4	Dynamic Viscosity • An exploration of dynamic viscosity and its significance in fluid dynamics.
Week 5	Kinetic Viscosity • Investigation of the properties of kinetic viscosity and its practical applications.
Week 6	Pascal's Principle • Study of Pascal's Principle and its relevance in hydraulics and fluid mechanics.
Week 7	Midterm Exam and Discussion • A discussion session following the midterm exam to clarify essential concepts.
Week 8	Archimedes' Principle • Analysis of Archimedes' Principle and its effects on buoyancy.
Week 9	Surface Tension • Exploration of surface tension and its effects on liquids and gases.
Week 10	Continuity and Bernoulli's Equations

	• Study of the principle of continuity and Bernoulli's equations in fluid dynamics.
Week 11	Energy and Kepler's Laws • Investigation of energy principles and Kepler's laws related to planetary motion.
Week 12	Introduction to Magnetic Fields • An overview of magnetic fields and their characteristics.
Week 13	Effects of Magnetic Fields • Examination of the effects of magnetic fields and their applications.
Week 14	Review • Comprehensive review of topics from Weeks 9-14 in preparation for the final exam.
Week 15	Final Exam Preparation • The final week is dedicated to thorough review and preparation for the final exam.
Week 16	Final Examination

Resources for Teaching and Learning **الموارد المخصصة للتدريس والتعلم**		
	Resource Availability	**Library Resource Availability**
Required Texts	*Riley, K.F., Hobson, M.P. and Bence, S.J., 2006. Mathematical methods for physics and engineering: a comprehensive guide. Cambridge University Press.* *Gregory, R.D., 2006. Classical mechanics. Cambridge University Press.*	Yes
Recommended Texts	The central library, science library, and departmental repository house crucial texts and distinctive resources pertinent to Mathematical Physics.	Yes
Websites	– Specialized academic websites. – Virtual library services provide resources that are accessible from international university libraries.	

Grading Scheme **مخطط الدرجات**				
Assessment Groups and Corresponding Grades	**Grade**		**Marks (%)**	**Definition**
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