First and Second Semester

Module 1

Module Information			
Module Title	Workshops		Module Delivery
Module Type	Support		☐ Theory ☐ Lecture ☐ Lab ☐ Tutorial ■ Practical ☐ Seminar
Module Code	WORSH11		
ECTS Credit/year	4		
SWL/year	100		
Module level	1	Semester of Delivery	1, 2
Module Leader	Training and Workshops Center	College	
Module Leader Academic Title	Prof.	e-mail	twc@uotechnology.edu.iq
Module Tutor		Module Leader's Qualification	Ph.D.
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	1/6/2023	e-mail	
		Version Number	1

Relation with other Modules			
Prerequisite Module	-	Semester	-
Co-requisite Module	-	Semester	-

Module Aims, Learning Outcomes and Inductive Contents	
Module Aims	1-Preparing applied engineers in the field of engineering sciences who are distinguished by a high level of knowledge and technological creativity, in line with the strict standards adopted globally in quality assurance and academic accreditation of the corresponding engineering programs, while adhering to the ethics of the engineering profession. 2. Enable the student to know and understand work systems, risks, and the factors surrounding them. 3. Enable the student to know and understand theoretical principles in handicrafts and measurements.
Module Learning Outcomes	1- To familiarize the student with the vocabulary of occupational safety and its importance in the field of work. 2- Acquisition of the student's manual operation skills, for example (Filings and

	Tinsmith workshops), and mechanical operation skills, for example (Turning). 3- Acquisition of the student's mechanical forming skills, for example (Casting and Blacksmithing). 4- The student acquires basic engineering skills such as Welding, Carpentry, and Electrical installations that serve him in the professional field. 5- Enabling the student to operate the various machines and devices in mechanical operations and formation. 6- Cooperative learning by working collectively.
Inductive Contents	1. Introducing the student to the basics of the art of turning and milling, types of cold working machines, the skill of dealing with them, choosing metals, operational tools, and methods of measurement and standardization 2. Introducing the student to the basics of the art of casting, hot forming, metal selection, method of working on casting furnaces and tools, and manufacturing casting molds 3. Familiarize students with the basics of cars and the systems they use, as well as maintenance, disassembly, and assembly processes. 4. Introducing students to the basics of household and industrial electrical appliances, the skill of using tools, and designing electrical circuits and control panels 5. Introducing the student to the basics of the art of plumbing, leveling surfaces, the skill of using tools, manufacturing and installing geometric shapes, and methods of measurement and standardization 6. Introducing the student to the basics of the art of blacksmithing, cold and hot forming of metals, the method of hardening them, and the skills of dealing with hand tools, forming machines, and heating furnaces 7. Introducing the student to the basics of the art of filing and manual operation of metals with the help of manual, electrical, and mechanical tools, the skills of dealing with them, and the methods of measurement and standardization 8. Introducing the student to the basics of the art of welding, the installation and assembly of metals, the types of welding machines, the skills of dealing with them, the types of welding, and the methods of measurement and standardization 9. Introducing the student to the basics of the art of carpentry and woodworking with the help of manual, electrical, and mechanical tools, the skills of dealing with them, and methods of measurement and standardization

Learning and Teaching Strategies	
Strategies	

Student Workload (SWL)			
Structured SWL (h/sem)	46.5	Structured SWL (h/w)	3.00
Unstructured SWL (h/sem)	3.5	Unstructured SWL (h/w)	0.23
Total SWL (h/sem)	50		
Structured SWL (h/year)	93	Structured SWL (h/w)	3.00
Unstructured SWL (h/year)	7	Unstructured SWL (h/w)	0.23
Total SWL (h/year)	100		

Module Evaluation					
		Time/No.	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes				
	Assignments				All
	Projects / Practice	Every 3 weeks	60%	Continuous	
	Report				
Summative Assessment	Midterm Exam				
	Exam	Every 3 weeks	40%	Continuous	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)	
	Materials Covered
Week 1	Welding workshop. -Occupational safety and its importance in welding workshops. -Introduction to the basics of welding. -Electric arc exercise. -An exercise for welding straight lines in a circular motion (helical).
Week 2	Welding workshop - An exercise for welding straight lines with a crescent movement and other welding methods -Construction welding exercise.
Week 3	Welding workshop. -Welding two pieces together. -Written exam in practical exercises. -
Week 4	Casting workshop -Occupational safety and its importance in plumbing workshops.

	-Introduction to the basics of metal casting. -Simple wooden disc exercise. Half workout.
Week 5	Casting workshop Wheel exercise. Pushing arm exercise.
Week 6	Casting workshop. -Complete pulley exercise. -Circular pole exercise. -Written exam in practical exercises.
Week 7	Blacksmith Workshop -Occupational safety and its importance in blacksmithing workshops. -Introduction to the Basics of Blacksmithing. - Barbell adjustment exercise. -Eight-star exercise. - Exercise forming the number eight in English. -Six formation exercises in English.
Week 8	Blacksmith Workshop -An exercise forming the number five in English. - Exercise forming the number nine in English. -An exercise in forming an iron model in the form of a circle .
Week 9	Blacksmith Workshop - S-shape exercise. - Air hammer hot barbell exercise. - Exercise to form a circle on an electric bending machine. - Exercising cold and hot ornament formation. - A written exam in practical exercises .
Week 10	Automotive Workshop -Occupational safety and its importance in car maintenance workshops. -An introduction to cars and their basic parts. -Parts of the engine, how it works, types of engines, and methods of classification.
Week 11	Automotive Workshop - Open the engine and identify the parts -Lubrication system -Cooling system.
Week 12	Automotive Workshop -The fuel system. -The old and new ignition circuits. -Written exam in practical exercises.
Week 13	Turning Workshop -Introduction to lathe machines and identifying their parts -Measuring tools and the use of an oven measuring instrument

	-Circular column lathing exercise on different diameters.
Week 14	Turning Workshop -Exercise using the pen (semicircular R) brackets. An exercise in making different angles using a pen (square + angle pen 55).
Week 15	Turning Workshop - Making shaft with different diameter exercises using (left and right pen) - Workout (Tube Connection). -Written exam in practical exercises.
Week 16	Fitting workshop Occupational safety and its importance in filing workshops -An introduction to the basics of filing -Pen holder exercise “preparation and preparation”
Week 17	Fitting workshop Pencil holder exercises finishing and assembling.
Week 18	Fitting workshop -The catcher exercise. - Clamping exercise. Written exam in practical exercises.
Week 19	Carpentry workshop -Occupational safety and its importance in carpentry workshops. - An introduction to carpentry, its types, types of wood, tools used, and preparation Preparing the tools used Face modification exercise using the reindeer
Week 20	Carpentry workshop Garden fence work and how to connect its parts, the eight-star exercise
Week 21	Carpentry workshop - Wood smoothing exercise using smoothing paper - Wood dyeing exercise in three stages Final smoothing and varnishing exercise Written exam in practical exercises
Week 22	The tinsmith workshop Occupational safety and its importance in plumbing workshops An introduction to plumbing, its tools, and plumbing stages Planning and marking exercise on metal plates
Week 23	The tinsmith workshop Geometric shapes Types of individuals and methods of individuals Geometric shape individuals exercise on a metal board
Week 24	The tinsmith workshop Cone members exercise

	- Exercise of cylinders with an oblique cut Roll forming operations Connection without the use of an intermediary Written exam in practical exercises
Week 25	Electric Workshop Occupational Safety and its importance in electrical workshops An introduction to the basics of electrical installations - Linking a simple circuit consisting of a lamp to the control of a single-way switch. Connect two lamps in series with one-way switch control. Connecting two lamps in parallel with the control of a single road switch. Connect two lights with one-way dual switch control.
Week 26	electric Workshop Connect a fluorescent lamp circuit to a one-way switch control Connecting an electric supply socket circuit to the control of a separate or combined one-way switch Written exam in practical exercises
Week 27	electric Workshop Occupational Safety and its importance in blacksmithing workshops Introduction to the basics of Blacksmithing - Barbell adjustment exercise Eight-star exercise - Exercise forming the number eight in English Exercise forming the number six in English
Week 28	supplementary training curriculum Welding workshop Plumbing workshop Blacksmith's workshop
Week 29	supplementary training curriculum - Automotive workshop - Turning workshop Fitting workshop
Week 30	supplementary training curriculum Carpentry workshop The plumbing workshop electric Workshop

Learning and Teaching Resources		
	Text	Available in the library
Required Texts	Workshop technology and measurements, Ahmed Salem Al-Sabbagh,	yes

Recommended Texts		
Websites		

	Ministry of Higher Education and Scientific Research - Iraq University of Technology Applied Sciences Department Mathematics and Computer Application Branch	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	CALCULUS I		**Module Delivery**	
Module Type	CORE		☒ **Theory** **x Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CALC111			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	1		**Semester of Delivery**	1
Administering Department	ENLA115		ENLA115	ENLA115
Module Leader	Mayada N. Mohammedali		**e-mail**	mayada.N.Mohammedali@uotechnology.edu.iq

Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	M Sc.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	Dr. Jehad R. Kider	**e-mail**	jehad.r.kider@uotechnology.edu.iq
Review Committee Approval	01/06/2023	**Version Number**	1.0

Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Introduce the fundamental principles of applied mathematics. 2. Enable the student to use mathematics for practical applications in various scientific fields. 3. Familiarizes the student with the concept of a function, its domain, trigonometric functions, the purpose of a function, and its derivatives. 4. covers functions, their domains, purposes, various methods of solving them, trigonometric functions, their domains, methods of differentiation, and complex numbers and their properties.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A - Cognitive Objectives 1. Familiarize the student with the concept of functions. 2. Enable the student to study continuous functions. 3. Enable the student to study trigonometric functions. 4. Familiarize the student with the purposes of functions and methods of solving them. 5. Familiarize the student with differentiation methods. B - Skills Objectives specific to the course 1. Teach the student the basic vocabulary of mathematics. 2. Enable the student to use functions and derive them in various important topics where functions are applicable.

	3. Educate the student about the applications of functions. 4. Enable the student to use the internet to access more information related to the course. 5. Enable the student to use books and references related to the course.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A- Differential Calculus 1- Revision and Basic Concepts : Coordinates and graphs in the plane slope, Equations for lines, Functions and their graphs shifts, the definition of limits, properties of limit, definition of derivative, laws of derivative, implicit derivative, higher order derivative, the L-hopitals rule. (5 hrs) 2- Trigonometric Functions: A brief review of trigonometric relations, limit of trigonometric functions, derivative of trigonometric functions. (6 hrs) 3- Transcendental Functions: Domain, range and graphs of natural logarithm functions, properties of natural logarithm functions, limit and derivative of natural logarithm functions, domain, range and graphs of exponential functions, properties of exponential functions, limit and derivative of exponential functions, domain, range and graphs of inverse trigonometric functions, limit and derivative of inverse trigonometric functions. (10 hrs) 4- Hyperbolic Functions: Domain, range and graphs of hyperbolic functions, Properties, Limit and derivative. (6 hrs) 5- Complex Numbers: Definition of complex number, Algebraic operations, Definition of complex number by sin(x) and cos(x) (polar form), Algebraic operations Definition of complex number by exponential function (Euler form), Algebraic operations, De Moivres theorem, Solve equations of complex numbers. (6 hrs) Part B - Integrational Calculus 1- The Integration

	Definition of indefinite and finite integration, laws of integration, Integration of trigonometric functions. (4 hrs) 2- Integration of Transcendental Functions Integration of Natural logarithm functions, Integration of exponential functions, Integration of inverse trigonometric functions. (4 hrs) 3- Method of Integration Integration by parts, partial fraction method, Trigonometric substitutions integrals involving $a^2+u^2, \sqrt{a^2+u^2}, a^2-u^2, \sqrt{a^2-u^2}, u^2-a^2, \sqrt{u^2-a^2}$ Method for integration with any rational function of sin(x) and cos(x), Method for integration with one root or different roots, Improper integrals. (8 hrs) 4- Integration of Hyperbolic functions, Laws of integration. (4 hrs) 5- Application of Definite Integrals Area of functions, Length of functions, Volumes, Surface area. (6 hrs) 6- Polar Coordinate Review equations and exercises, Graphs of polar equations, Laws of symmetry, Particular curves, Area in the plane. (4 hrs)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	112	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	30% (30)	3,6,8,15	LO #1, 2, 3,4and 9
	Assignments	2	5% (5)	7,14	LO # 6 and 7
	Projects / Lab.	/	/	/	
	Report	1	5% (5)	8	LO # 8
Summative assessment	**Midterm Exam**	2 hr	10% (10)	9	LO # 1-5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Coordinates and graphs in the plane slope, Equations for lines, Functions, and their graphs shifts.
Week 2	The definition of limits, properties of limit, definition of derivative, laws of derivative, implicit derivative

Week 3	Higher order derivative, the L-hopitals rule.
Week 4	A brief review of trigonometric relations, limit of trigonometric functions.
Week 5	Derivative of trigonometric functions.
Week 6	Domain, range and graphs of natural logarithm functions, properties of natural logarithm functions.
Week 7	Limit and derivative of natural logarithm functions.
Week 8	Domain, range and graphs of exponential functions, properties of exponential functions
Week 9	Limit and derivative of exponential functions
Week 10	Domain, range and graphs of inverse trigonometric functions
Week 11	Limit and derivative of inverse trigonometric functions.
Week 12	Domain, range and graphs of hyperbolic functions, Properties, Limit and derivative
Week 13	Definition of complex number, Algebraic operations, Definition of complex number by sin(x) and cos(x) (polar form)
Week 14	Algebraic operations Definition of complex number by exponential function (Euler form), Algebraic operations, De Moivres theorem, Solve equations of complex numbers.
Week 15	**Mid. Exam**
Week 16	**Final Exam**

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

Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	"Calculus and analytic geometry"; G.Thomas and R.Rinney; "Calculus"; R. Diprima;	Yes
Recommended Texts	"Calculus and analytic geometry"; Edwards &Penny;	Yes
Websites	https://www.coursera.org/courses?query=calculus	

APPENDIX:

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

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	COMPUTER SCIENCE			**Module Delivery**	
Module Type	CORE			☒ **Theory** x **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	COSC114				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	1		**Semester of Delivery**	1	
Administering Department	MATH001		**College**	APSC008	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To provide students with a thorough grounding in the theoretical and practical principles of computer science, and to show how these can be used to analyze problems that may be solved by computational techniques; 2. To provide students with knowledge of computer science, as well as equip them with a range of transferable skills; and 3. To encourage students to explore rigorously the core principles of the subject and to give them an understanding of its intellectual frontiers.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the core constructs of programming and how they are used in Matlab 2. Be able to write computer programs in Matlab 3. Gain an understanding of the underpinning theories of fundamental principles and technologies within the area of computer science 4. Gain technical expertise in the field of computer science, which will enable you to excel in this fast-developing area. 5. Gain an understanding of the interplay between computer science theory and practice 6. Gain appropriate software development and programming skills. 7. Learn and work both independently and within groups. 8. Develop the necessary study skills and knowledge to pursue further study.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Computer components, Binary and Decimal number systems and their Arithmetic Operations, Introduction to Algorithms, Problems analysis, Properties of Algorithm and Characteristics of Algorithm, Lab. [33 hrs] Properties of Algorithm and Characteristics of Algorithm, Logical or Relational Expressions, Pseudocode, Flowcharts, Loops: For Loops, While Loops and Control Statements, Loops: Infinite Loops, Nested Loops, Lab. [30 hrs] Nested Loops, Conditional Statements: if, case structures and relational operators, Conditional Statements: (1) if Statement, (2) if-else Statements, Two conditional

	logical expressions: if…elseif…else Statements, Two conditional logical expressions: if…elseif Statements, Lab. [30 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The strategy for delivering this course is to train students in algorithms and Matlab commands, gradually progressing from the fundamentals of computer components to algorithmic thinking and ultimately introducing basic programming in Matlab. Acquiring this skill necessitates consistent practice by students in order to gain the necessary expertise to attain the minimum level of intellectual capacity required for intelligence and relative success.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.46
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Hardware (Keyboard, Scanner, Monitor, Printer,…) and Software (Operating systems (Windows), Programming Languages, Application Programs …). Bit, byte, …, Conversion from Binary to Decimal and Vice Versa, additional numeral systems (Hexadecimal), File Format (Extation)
Week 2	Arithmetic Operations on Binary Numbers
Week 3	Introduction to Algorithms, Algorithmic Thinking
Week 4	Problems analysis: 1- Identify and define the problem. 2- Analyze the problem and determine the inputs and outputs. 3- Design the solution algorithm. 4- Write the code in a programming language. 5- Test and evaluate the code's results.
Week 5	Properties of Algorithm and Characteristics of Algorithm
Week 6	Logical or Relational Expressions, Pseudocode
Week 7	Flowcharts
Week 8	Loops: For Loops
Week 9	Loops: While Loops and Control Statements
Week 10	Loops: Infinite Loops
Week 11	Nested Loops
Week 12	Conditional Statements: if, case structures and relational operators
Week 13	Conditional Statements: (1) if Statement, (2) if-else Statements,
Week 14	Two conditional logical expressions: if…elseif…else Statements
Week 15	Two conditional logical expressions: if…elseif Statements
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Matlab graphical interface: Command Window, Workspace, Navigator, Toolstrip, M-file, Making Folders, Help/Docs, Scripts.
Week 2	Making Variables: Variable Types, Naming variables, Scalars (Examples and their Programs)
Week 3	Arrays: Row vector, Column Vectors, size and length, Vector Indexing (Examples and their Programs)
Week 4	Matrices, Matrix Indexing (Examples and their Programs)
Week 5	Advanced Matrix Indexing 1, Advanced Matrix Indexing 1 (Examples and their Programs)
Week 6	save/clear/load
Week 7	Basic Scalar Operations (Examples and their Programs)
Week 8	Built-in Functions (Examples and their Programs)
Week 9	Built-in Functions (Examples and their Programs)
Week 10	Transpose (Examples and their Programs)
Week 11	Addition and Subtraction of Matrices (Examples and their Programs)
Week 12	Element-Wise Functions (Examples and their Programs)
Week 13	Element-Wise Operations (Examples and their Programs)
Week 14	Standard Operations (Examples and their Programs)
Week 15	Basic Plotting (Examples and their Programs)

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Quarteroni, Alfio., Saleri, Fausto., Gervasio, Paola. Scientific Computing with MATLAB and Octave. Germany: Springer Berlin Heidelberg, 2010.	no
Recommended Texts		
Websites	https://www.google.iq/books/edition/Scientific_Computing_with_MATLAB_and_Oct/RytYRWlbuCsC?hl=en&gbpv=0&bshm=nce/1	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	ENGLISH LANGUAGE			**Module Delivery**	
Module Type	SUPPORT			☒ **Theory** ☒ **Lecture** ☐ **Lab.** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENLA115				
ECTS Credits	2.00				
SWL (hr/sem)	50				
Module Level	1		**Semester of Delivery**	1	
Administering Department	MATH001		**College**	APSC008	
Module Leader	Hassan Hamed Abd		**e-mail**		
Module Leader's Acad. Title	Lecture		**Module Leader's Qualification**	Master	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- English (1) is a first-class comprehensive course that provides the students the fundamental principles of English. 2- Some of the principles are illustrated with a nature. 3- It is focused on effective teaching and learning English 4- It is specially adapted for the Middle East and North Africa. 5- This course combines the best of English language teaching methodologies to help students use English accurately and fluently.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The objective of the course is for undergraduate students: 1. It will develop an understanding and appreciation of English language. 2. Students will acquire basic concepts of English, which are reading, writing, listening and speaking. 3. Students will focused on efficient instructions in studying English. 4. Students will be able to apply what they learn in their everyday life or in their study. 5. Provide students the best methodologies for Learning English language. 6. Help students to use English rightly and smoothly. 7. Discuss the various properties of materials in English. 8. Identify the basic elements and their applications in English.
Indicative Contents	Indicative content includes the following.

المحتويات الإرشادية	English (1) is a course for first-class students depending on theoretical lectures. It is a comprehensive course that provides the students the fundamental principles of English. , some of the principles are illustrated with a nature. In addition, it is focused on effective teaching and learning. English course is specially adapted for the Middle East and North Africa. This course combines the best of English language teaching methodologies to help students use English accurately and fluently. It is provides Basic Concepts materials and its applications. (15 hr.)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the English activities, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple analysis involving some enjoyable activities for the students to solve problems that related in materials analysis.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	15% (15)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	15% (15)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	There is no lab.			
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1.5 hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	- Introduction: Definition of course, course outline, and self introduce. - Placement test. - Course discussion and class plans.
Week 2	- General grammars: Present simple tense, past simple tense, and Future. - Vocabulary and pronunciation. - Audio-listening. - Group conversation.
Week 3	- Grammars reviews and prepositions: in, at, on, etc. - Reading and pronunciation. - Homework discussion.

Week 4	- Improve your spelling. - Vocabulary: Opposite verbs and positive and negative adjectives. - Class activities: Puzzle. - Homework discussion.
Week 5	- Intermediate grammars: Continuous tenses- present and past. - Practice your handwriting. - Writing a short speech. - Homework discussion.
Week 6	- Has and have: What is the difference? - Write and punctuate sentences. - Group work. - Homework discussion.
Week 7	- Negatives tense and modals- can and can't. - Improve your reading. - Solving exercises in class. - Homework discussion.
Week 8	- Speaking: Interviews. - What is dislike vs. like? - Writing a short speech.
Week 9	Exam and course review
Week 10	- Who, that, and where: What is the difference? - Vocabulary and Pronunciation. - Class activities: Write sentence, short talk "question and answer", and reading.
Week 11	- Adverb and preposition: during, in, ago, from, to, for, and since. - Audio-Listening. - Strategies and self- improvement. - Homework discussion.

Week 12	- Reading an article and complete a chart. - Crossword puzzle. - Writing a letter.
Week 13	- Speaking: Talk about things you need to have done. - Class activities: Match the verbs with nouns. - Improve your spelling. - Homework discussion.
Week 14	- Midterm Exam.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
	There is no lab.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	The course is: 1. First course textbook: Headway academic Skills Reading, Writing and study skills. Student's book, Sarah Philpot and Lesley Curnick, Series Editors Liz and John Soars, Oxford, University Press. 2011 2. First course textbook: Headway academic Skills listening, Speaking and study skills.Student's book, Sarah Philpot and Lesley Curnick, Series Editors Liz and John Soars, Oxford, University Press.	No
Recommended	There is no reference book but students can use any English textbook to help themselves for quick learning.	No

Texts		
Websites	Any videos about learning English Language	

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

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

	Ministry of Higher Education and Scientific Research - Iraq University of Technology Applied Sciences Department Mathematics and Computer Application Branch	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	FINITE MATHEMATICS			**Module Delivery**	
Module Type	CORE			☒ **Theory** x **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	FIMA113				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	1	
Administering Department	MATH001		**College**	APSC008	
Module Leader	Areej M. Abduldaim		**e-mail**	Areej.M.Abduldaim@uotechnology.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Dr. Jehad R. Kider		**e-mail**	E-mail: jehad.r.kider@uotechnology.edu.iq	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	4. This course deals with the basics of several mathematical concepts. 5. To build thinking skills and understanding of elementary topics. 6. To understand vectors, matrices, and advanced methods on both of them. 7. To understand the essence of dealing with any structure formed by rows, columns, or both. 8. To Learn to transform any real-life problem into a mathematical system that can be solved. 9. To learn complex numbers, their algebraic properties, the geometry of the complex number, powers and roots, regions in the complex plane
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	9. Learn how to write vectors and understand the arithmetic operations of vectors. 10. Represent vectors analytically and geometrically, and compute dot and cross products for presentations of lines and planes. 11. Find the determinant and inverse for any matrix. 12. Solve systems of linear equations by use of the matrix (using Gaussian elimination and Cramer's rule to find the solution of any system of leaner equations). 13. Represent complex numbers algebraically and geometrically.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Vectors and Matrices: Algebraic operations between vectors, dot and cross product, the definition of the matrix, and type of matrices. [20 hrs]

	Determinant of matrices and matrix inverse, the solution of a system of linear equations using Gaussian elimination and Crammer's rule. [23 hrs] Matrices and Movement, Translations, Scaling, Reflections & Rotations. Complex Numbers. [20 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The strategy to be followed in delivering this course is to train students in mathematical and logical thinking to solve problems related to mathematics and computer science. Acquiring this skill requires continuous practice by students to gain the necessary expertise to reach the minimum level of intellectual capacity required for intellectual and relative success.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	30% (30)	3,6,8,15	LO #1, 2, 3,4and 9
	Assignments	2	5% (5)	7,14	LO # 6 and 7

	Projects / Lab.	/	/	/	
	Report	1	5% (5)	8	LO # 8
Summative assessment	**Midterm Exam**	2 hr	10% (10)	9	LO # 1-5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Vectors and their Use in Computing, Cartesian Coordinates in Plane and Space, Basic Vector Properties in R^2 and R^3: Arithmetic Operations, Vector Joining Two Points
Week 2	Dot Product and its Algebraic Properties, Collinear Vectors, Vector Projection and Scaler Projection
Week 3	Cross Product and its Algebraic Properties, The Area of Triangle and Parallelogram Using Cross Product, The Volume of the Parallelepiped Using Cross Product
Week 4	Matrices: Order of a Matrix, Row Matrix and Column Matrix, Special Matrices, Particular Cases of Square Matrix, Symmetric Matrix, Skew- Symmetric Matrix,
Week 5	Matrices: Orthogonal Matrix, Hermitian Matrix, Standard Basis Matrix E_{ij}, Algebra of Matrices and Operations on Matrices
Week 6	Matrices: Multiplication of a matrix By a scalar, Addition and subtraction of Matrices, Multiplication of Matrices, Properties of Matrix Multiplication, Transpose and Conjugate Transpose of Matrices
Week 7	Determinant: Determinant of a 2×2 matrix, Determinant of a 3×3 matrix, Rule of Sarrus, Determinant of a 4×4 matrix,
Week 8	Determinant: Properties of Determinants of Matrices, (i,j)-Minors of a Matrix, Cofactors of a Matrix, nxn Determinant
Week 9	Matrix inverse: Division in Matrix Algebra, Singular and Non Singular Matrices, The Ajoint Matrix
Week 10	Matrix inverse: The Inverse of a Matrix, Properties of Inverses
Week 11	Systems of linear equations: Gaussian elimination
Week 12	Cramer's rule
Week 13	Matrices and Movement: Translations, Scaling, Reflections & Rotations.
Week 14	Complex Numbers: The Complex Numbers, Algebraic Properties, Geometry of the Complex Number
Week 15	Complex Numbers: Powers and Roots, Regions in the Complex Plane
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Cesar O. Aguilar, Linear Algebra I Lecture Notes, Department of Mathematics SUNY Geneseo	no
Recommended Texts		
Websites	https://www.geneseo.edu/~aguilar/public/assets/courses/233/main_notes.pdf	

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

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

	Ministry of Higher Education and Scientific Research - Iraq University of Baghdad College of Engineering Department of Electrical Engineering	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Foundation of Mathematics I**			**Module Delivery**	
Module Type	CORE			☒ **Theory** x **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	FOMA112				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	1	
Administering Department	MATH001		**College**	APSC008	
Module Leader	Dr.Raghah Ibrahim Sabri		**e-mail**	raghad.i.sabri@uotechnology.edu.iq	
Module Leader's Acad. Title	Assist Professor		**Module Leader's**	Ph.D.	

		Qualification	
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	Dr. Jehad R. Kider	**e-mail**	Jehad.r.kider@uotechnologoy.edu.iq
Review Committee Approval	01/06/2023	**Version Number**	1.0

Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Demonstrate knowledge of basic concepts and theories from logic, set theory, number theory, relationships. 2. To understand how student knowledge of mathematical proof methods. 3. Knowledge of the student with other types of basic concepts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The student's knowledge of the concept of logical sentences 2. Knowledge of the student about the groups and the operations on these groups. 3. Recognize and describe the mathematical sentences . 4. The student gets acquainted with the subject of foundations of mathematics and its relationship in various fields such as science. and engineering. 5. Summarize what is meant by a basic foundation of mathematics. 6. Discuss the basic definitions and methods reaction and involvement of sets, functions, relations and mapping. 7. Identify the basic theorems of basic sets like natural number , integer numbers and rational Numbers.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A

	Logic statements (truth table, conjunction, disjunction, negation, Tautology, logical reusing, sentences, Algebra of a proposition, Quantifiers, Components statements, logical analysis, Mathematical proof). (26 hrs) Sets (set concept, equal sets, subsets, Venn diagrams, universal set, finite set, infinite set, Intersection and basic theorem, union, and basic theorem, the difference of two sets with theorems, complement set, relative complement). [26 hrs] Relations (relation concept, Cartesian product, equivalence relation, equivalence class, anti-symmetric relation, type of relation, composition of relations, partial order relation, strict order relation, Partially ordered sets, comparable, Totally ordered sets, well-ordered sets) [26 hrs] <u>Part B -</u> Mappings (Domain and range, surjective mapping, Bijective mapping, equality of mapping, composite mapping, inverse mapping).(15 hrs) The set (Natural number, Construction of natural numbers, pianos axioms, Order on Natural numbers, Mathematical induction, addition definition for Natural number, Theorems of addition operation, Multiplication definition for Natural number, Theorems of multiplication operation, integer numbers, Construction of integer numbers, Addition, and subtraction of integer numbers, Associative law for addition and multiplication).(23 hrs) Groups (Basic definitions and concept of Groups, concept of subgroups, Basic theorems, examples of groups, operation on groups) .[19 hrs] Rational Numbers (Construction of rational numbers, concept of field with some example, Archimedes property, field of rational numbers, order field). [19 hrs]
Learning and Teaching Strategies	

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

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	30% (30)	3,6,8,15	LO #1, 2, 3,4and 9
	Assignments	2	5% (5)	7,14	LO # 6 and 7
	Projects / Lab.	/	/	/	

	Report	1	5% (5)	8	LO # 8
Summative assessment	**Midterm Exam**	2 hr	10% (10)	9	LO # 1-5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Logic statements, (Logic statements, truth table).
Week 2	Logic statements, (conjunction, disjunction, negation).
Week 3	Logic statements (Tautology, logical reusing).
Week 4	Logic statements (Algebra of a proposition, Quantifiers, Components statements).
Week 5	Logic statements (Logical analysis, Mathematical proof).
Week 6	Sets (set concept, equal sets, subsets, Venn diagrams).
Week 7	Sets (Universal set, finite set, infinite set, intersection and basic theorem, union and basic theorem, the difference of two sets with theorems).
Week 8	Sets (complement set, relative complement).
Week 9	Relations (relation concept, Cartesian product, equivalence relation).
Week 10	Relations (The equivalence class, anti-symmetric relation).
Week 11	Relations (Type of relations, the composition of relations).
Week 12	Relations (partial order relation, strict order relation).
Week 13	Order of sets (Partially ordered sets, comparable).

Week 14	Order of sets (Totally ordered sets, well-ordered sets).
Week 15	**Preparatory Week**
Week 16	**Final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Introduction to the foundations of mathematics , Raymond L. wilder, 2nd edition, John wiley & Sons. Inc. new York. London.Sydney.1967	Yes

Recommended Texts	The Foundations of Mathematics by Kenneth Kunen, College Publications , London, United Kingdom,2007	yes
Websites		

APPENDIX:

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

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

	Ministry of Higher Education and Scientific Research - Iraq University of Technology College of Science Department of Biotechnology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	HUMAN RIGHTS			**Module Delivery**	
Module Type	SUPLEMENT			✓ **Theory** ✓ **Lecture** **Lab** ✓ **Tutorial** **Practical** **Seminar**	
Module Code	HURI126				
ECTS Credits	2.00				
SWL (hr/sem)	50				
Module Level	1		**Semester of Delivery**	1	
Administering Department	MATH001		**College**	APSC008	
Module Leader	Nagham A. Hussein		**e-mail**	150006@uotechnology.edu.iq	
Module Leader's Acad. Title	Asst. Professor		**Module Leader's Qualification**	master	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	-		**e-mail**	-	
Review Committee Approval	-		**Version Number**	1	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1.Developing and flourishing the human personality in its emotional, intellectual and social dimensions, and rooting in its sense of dignity, freedom, equality, social justice and democratic practice. 2. Enhancing people's awareness - women and men - of their rights in a way that helps enable them to transform the principles of human rights into a social, economic, cultural and political reality, and raise their ability to defend, maintain and advance them at all levels. 3. Strengthening the bonds of friendship and solidarity among peoples, enhancing respect for the rights of others, preserving cultural pluralism and diversity, flourishing national cultures for all groups and peoples, enriching the culture of dialogue and mutual tolerance, rejecting violence and terrorism, promoting non-violence and combating intolerance, and providing all people with strong immunity against hate speech. 4. Promoting a culture of peace based on justice and respect for human rights, foremost of which is the right to self-determination, the right to resist occupation, and the democratization of international relations and the institutions of the international community, so as to reflect the common interests of humanity.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Students benefit from knowing the types of rights and their field of application. 2- Clarifying the historical stages of human rights and the extent of their development. 3- Knowing the correct concept of freedoms and democracy. 4 - Providing the student with the moral values that require adherence to them and clarifying the most important rights and duties entrusted to the individual. 5- Knowing the rights and duties of the Iraqi individual 6 - Introduction to the history of human rights and stages of development.		

	7 - Spreading culture and feeding students from the Islamic side. 8 - How to preserve society and the country by strengthening the country's love for them. 9 - Learn about the most important rights granted to them in accordance with international norms and laws. 10 - Enhancing citizenship among students.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Teaching human rights requires learning to be based on participatory practice in an atmosphere of mutual respect so that everyone is aware of their shared responsibility to make human rights a reality. n the other hand, “human rights education” was defined in a practical and detailed manner for the purpose of the contract, as: “training, publishing and media efforts aimed at creating a global culture in the field of human rights by sharing knowledge and skills and shaping behavior in order to: 1. Promote respect for human rights and fundamental freedoms. 2. The full development of the human personality and its sense of dignity. 3. To promote understanding, tolerance, gender equality, and friendship among all nations, indigenous peoples, and racial, national, ethnic, religious, and linguistic groups. 4. Enabling all individuals to participate effectively in a free society. 5. Advance the activities of the United Nations in order to maintain peace.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	-Relying on concrete and realistic evidence and examples of human rights and the concept of democracy that reflects the nature of society and the environment that fosters the individual. -Teaching students the mechanism of scientific thinking, analysis and deduction. -Motivate students to find realistic problems and solve them in a scientific way. - Brainstorming, which gave the students an opportunity to present and discuss their ideas. -Lectures. -Intellectual questions and discussions.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	15% (15)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	15% (15)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	-	-	-	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	The concept of human rights (definition of human rights - their characteristics).
Week 2	Human rights in ancient civilizations, human rights in the Christian and Jewish religions, and human rights in Islam.
Week 3	Human rights sources - international sources - the Universal Declaration of Human Rights - the two international covenants on human rights
Week 4	National Sources - Declaration of the Rights of Man and the French Citizen - French Constitutions and Declarations - Constitution of the Republic of Iraq for the year 2005
Week 5	Human rights guarantees - Human rights guarantees at the internal level - Constitutional guarantees - Judicial guarantees
Week 6	Human rights in Islam - Adoption of the principle of dual responsibility in Islamic society - The religious character of Islamic law - Human trafficking
Week 7	**Mid-term Exam**

Week 8	The concept of democracy (development - definition - dimensions)
Week 9	Forms of democracy (direct democracy - its applications - an assessment of its system)
Week 10	Semi-direct democracy (concept - manifestations - appreciation)
Week 11	Representative democracy (concept - pillars - forms)
Week 12	The Representative Council - the single-parliamentary system and the two-chamber system - the internal organization of the Representative Council
Week 13	The mechanism of the representative system (parliamentary) - the concept of election and its legal adaptation - the electorate (its concept - the formation of the electorate)
Week 14	Organizing the election process - Election systems
Week 15	**Preparatory Week**
Week 16	**Final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Human rights, children and democracy, Dr. Maher Saleh Allawi Al-Jubouri, Dr. Raad Naji Al-Jeddah, Dr. Riyadh Aziz Hadi, d. Cackle Abdel-Ankoud, d. Ali Abdul Razzaq Muhammad, d. Hassan Muhammad Shafiq, Dar Ibn Al-Atheer for Printing and Publishing, 2009.	Yes
Recommended Texts	Hadi, Riyadh Azaz. (2005). Human rights (development - contents - protection) (Baghdad). Al-Dulaimi, Hafez Alwan. (2009). Contemporary reading	No

	of the issue of human rights.	
Websites	"Methods, education and culture of human rights", published on the International Information Network (Internet) on the website http://ghrorg-learning.blogspot.com	

APPENDIX:

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

Note:

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

	Ministry of Higher Education and Scientific Research - Iraq University of Technology Applied Sciences Department Mathematics and Computer Application Branch	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	CALCULUS II			**Module Delivery**	
Module Type	CORE			✓ **Lecture** ✓ **Tutorial**	
Module Code	CALC121				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	1		**Semester of Delivery**	2	
Administering Department	MATH001		**College**	APSC008	
Module Leader	Mayada N. Mohammedali		**e-mail**	mayada.N.Mohammedali@uotechnology.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	MSc.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	Dr. Jehad R. Kider		**e-mail**	jehad.r.kider@uotechnology.edu.iq	

Review Committee Approval	01/06/2023	Version Number	1.0

Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Calculus I	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	5. The student's knowledge of the concept of integration, methods of integration, areas and volumes with solving some practical examples. 6. Develop performance skills in using examples from practical life, such as finding the area and length of a specific wire… 7. To develop the student with the applications of integration in solving various mathematical problems. 8. The ability to be creative, innovative and develop individual skills and talents. 9. Enable the student to use books and references related to the course. 10. Enable the student to use the Internet to view more information related to the course.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A - Cognitive Objectives 6. Develop performance skills in using examples from practical life, such as finding the area and length of a specific curves. 7. To develop the student with the applications of integration in solving various mathematical problems. B - Skills Objectives specific to the course 6. Teach the student the basic vocabulary of mathematics. 7. Enable the student to use functions and derive them in various important topics where functions are applicable. 8. Educate the student about the applications of functions. 9. Enable the student to use the internet to access more information related to the course.

	10. Enable the student to use books and references related to the course.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Integrational Calculus 7- The Integration Definition of indefinite and definite integration, laws of integration, Integration of trigonometric functions. (8 hrs) 8- Integration of Transcendental Functions Integration of Natural logarithm functions, Integration of exponential functions, Integration of inverse trigonometric functions. (10 hrs) 9- Method of Integration Integration by parts, partial fraction method, Trigonometric substitutions integrals involving $a^2+u^2, \sqrt{a^2+u^2}, a^2-u^2, \sqrt{a^2-u^2}, u^2-a^2, \sqrt{u^2-a^2}$ Method for integration with any rational function of $sin(x)\ and\ cos(x)$, Method for integration with one root or different roots, Improper integrals. (16 hrs) 10- Integration of Hyperbolic functions, Laws of integration. (6 hrs) 11- Application of Definite Integrals Area of functions, Length of functions, Volumes, Surface area. (10 hrs) 12- Polar Coordinate Review equations and exercises, Graphs of polar equations, Laws of symmetry, Particular curves, Area in the plane. (8 hrs) Revision problem classes (6 hrs)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the

	students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	112	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	30% (30)	3,6,8,15	LO #1, 2, 3,4and 9
	Assignments	2	5% (5)	7,14	LO # 6 and 7
	Projects / Lab.	/	/	/	

	Report	1	5% (5)	8	LO # 8
Summative assessment	**Midterm Exam**	2 hr	10% (10)	9	LO # 1-5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - Definition of Integration with Examples, The Integration Definition of indefinite and definite integration.
Week 2	Integration of trigonometric functions, laws of Integration of trigonometric functions.
Week 3	laws of Integration of trigonometric functions.
Week 4	Integration of Transcendental Functions.
Week 5	Integration of Natural logarithm functions.
Week 6	Integration of exponential functions.
Week 7	Integration of inverse trigonometric functions.
Week 8	Method of Integration Integration by parts, partial fraction method, Trigonometric substitutions integrals involving $a^2+u^2, \sqrt{a^2+u^2}, a^2-u^2, \sqrt{a^2-u^2}, u^2-a^2, \sqrt{u^2-a^2}$.
Week 9	Method for integration with any rational function of $sin(x)\ and\ cos(x)$, Method for integration with one root or different roots.
Week 10	Improper integrals , Application of Definite Integrals.
Week 11	Area of functions, Length of functions.
Week 12	Volumes, Surface area.

Week 13	Polar Coordinate Review equations and exercises.
Week 14	Particular curves, Area in the plane.
Week 15	**Mid. Exam**
Week 16	**Final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	"Calculus and analytic geometry"; G.Thomas and	Yes

	R.Rinney; "Calculus"; R. Diprima;	
Recommended Texts	"Calculus and analytic geometry"; Edwards &Penny;	Yes
Websites	https://www.coursera.org/courses?query=calculus	

APPENDIX:

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

Note:

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

	Ministry of Higher Education and Scientific Research - Iraq University of Technology Applied Sciences Department Mathematics and Computer Application Branch	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	DISCRETE MATHEMATICS			**Module Delivery**	
Module Type	CORE			☒ **Theory** x **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	DIMA123				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	1		**Semester of Delivery**	2	
Administering Department	MATH001		**College**	APSC008	
Module Leader	Areej M. Abduldaim		**e-mail**	Areej.M.Abduldaim@uotechnology.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Dr. Jehad R. Kider		**e-mail**	E-mail: jehad.r.kider@uotechnology.edu.iq	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	10. The focus of the module is on basic concepts in discrete mathematics and on applications of discrete mathematics in number theory and algorithms. To show students how discrete mathematics can be used in other mathematical topics and modern computer science (with a focus on algorithms analysis). 11. To provide students with a range of tools needed for various areas of Mathematics and Computer Science. 12. To understand and explain the basics of modular arithmetic while presenting a progression of more difficult and more interesting problems that are easily solved using modular arithmetic. 13. To perform modular arithmetic and to perform operations in modular arithmetic. 14. Work application problems using modular methods 15. To give students an understanding of the nature of an algorithmic solution to problems and analysis (investigate algorithm complexity). 16. To illustrate the idea by applications to problems in discrete mathematics, and to promote an algorithmic viewpoint in subsequent mathematical work. 17. To introduce students to graph theory and Trees and their varied applications.
Module Learning Outcomes	14. By the end of the module students will: be able to solve a range of predictable and less predictable problems in Discrete Mathematics. 15. have an awareness of the basic concepts of theoretical mathematics in the

مخرجات التعلم للمادة الدراسية	field of Discrete Mathematics. 16. Have a broad knowledge and basic understanding of these subjects demonstrated through one or more of the following topic areas: Divisibility, Prime Numbers, The Fundamental Theorem of Arithmetic, Greatest common divisor, Euclidean algorithm, Least common multiple, Chinese Remainder Theorem, 17. Students will have basic mathematical skills in the following areas: Congruence Classes Modulo n, Boolean Algebra, Algorithm Analysis and Complexity, introduction to graph theory, and Trees. 18. Students will develop the ability to write mathematical reports with rigor and precision. 19. Students will have basic problem solving skills.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. The Division Algorithm, Divisibility, Prime Numbers, The Fundamental Theorem of Arithmetic, Greatest common divisor, Prime Factorization, Finding the gcd by Prime Factorization, Euclidean algorithm, Relatively prime, Least common multiple, Euler's Phi Function and Euler's Theorem, Congruences: Congruences, Properties of Congruences, Chinese Remainder Theorem, Integers Modulo n: Congruence Classes Modulo n, Practical Labs. [33 hrs] Boolean Algebra: Abstract Boolean Algebras, Properties of Boolean Algebras, Boolean Functions: Canonical and Standard Forms, Algorithm Analysis: Measuring Time Algorithm Analysis: Time Complexity Classes, The Complexity of the Algorithm: Big-O: Asymptotic Upper Bounds, Big-Ω: Asymptotic Lower Bounds, Big-Θ, Practical Labs. [30 hrs] The Complexity of the Algorithm: The Effects of Increasing InputSize, The Effects of a Faster Computer, Graph Theory: Definition of Graphs, Special Graphs, Subgraph, Representations of Graphs, Graph Theory: Paths and Circuits, Planar Graphs, Trees: Definition of Trees, Binary Trees, Trees: Decision Trees, Tree Isomorphisms, Practical Labs. [30 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The strategy to be followed in delivering this course is to train students in discrete mathematical and logical thinking to solve problems related to discrete concepts applied in computer science. Acquiring this skill requires continuous practice by students to gain the necessary expertise to reach the minimum level of intellectual capacity required for intellectual and relative success.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.46
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	20% (20)	3,6,8,15	LO #1, 2, 3,4and 8
	Assignments	2	5% (5)	7,14	LO # 6
	Projects / Lab.	2	10% (10)		
	Report	1	5% (5)	8	LO # 4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	9	LO # 1-5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The Division Algorithm, Divisibility, Prime Numbers, The Fundamental Theorem of Arithmetic
Week 2	Greatest common divisor, Prime Factorization, Finding the gcd by Prime Factorization
Week 3	Euclidean algorithm, Relatively prime, Least common multiple, Euler's Phi Function and Euler's Theorem
Week 4	Congruences: Congruences, Properties of Congruences, Chinese Remainder Theorem
Week 5	Integers Modulo n: Congruence Classes Modulo n
Week 6	Boolean Algebra: Abstract Boolean Algebras, Properties of Boolean Algebras
Week 7	Boolean Functions: Canonical and Standard Forms
Week 8	Algorithm Analysis: Measuring Time
Week 9	Algorithm Analysis: Time Complexity Classes
Week 10	The Complexity of the Algorithm: Big-O: Asymptotic Upper Bounds, Big-Ω: Asymptotic Lower Bounds, Big-Θ
Week 11	The Complexity of the Algorithm: The Effects of Increasing InputSize, The Effects of a Faster Computer
Week 12	Graph Theory: Definition of Graphs, Special Graphs, Subgraph, Representations of Graphs
Week 13	Graph Theory: Paths and Circuits, Planar Graphs
Week 14	Trees: Definition of Trees, Binary Trees
Week 15	Trees: Decision Trees, Tree Isomorphisms
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Writing and implementing a program using Matlab to check if a number is a prime
Week 2	Writing and implementing a program using Matlab to find the greatest common divisor
Week 3	Writing and implementing a program using Matlab to write a number as a product of primes
Week 4	Writing and implementing a program using Matlab to check if two numbers are relatively prime
Week 5	Writing and implementing a program using Matlab to find the least common multiple

Week 6	Writing and implementing a program using Matlab to evaluate the value of $2x^3 - 6x^2 + 2x - 1$ for x = 3
Week 7	Writing and implementing a program using Matlab to find the roots of a quadratic function $ax^2 + bx + c = 0$, where a, b and c are real numbers and $a \neq 0$
Week 8	Writing and implementing a program using Matlab to implementation of Loops. a) to calculate the factorial of a number. b) to calculate the sum of the first n natural numbers where n is finite. c) for cube sum of first n natural numbers where n is finite.
Week 9	Writing and implementing a program using Matlab to implement the following Boolean expression: (1) A'B+AB', (2) (AB'+C)+ C'A
Week 10	Writing and implementing a program using Matlab (b = mod(a,m))to (1) compute 23 modulo 5. (2) Find the remainder after division for a vector of integers (1,2,3,4,5) and the divisor 3. (3) Find the remainder after division for a set of integers [-4 -1 7 9] including both positive and negative values and the divisor 3. (4) Find the remainder after division by a negative divisor for a set of integers [-4 -1 7 9] including both positive and negative values and the divisor -3.
Week 11	Writing and implementing a program using Matlab to perform (1) addition modulo n. The function should take three inputs: a, b, and n. The output should be the result of adding a and b modulo n. (2) subtraction modulo n. The function should take three inputs: a, b, and n. The output should be the result of subtracting b from a modulo n. (3) multiplication modulo n. The function should take three inputs: a, b, and n. The output should be the result of multiplying a and b modulo n. (4) exponentiation modulo n. The function should take three inputs: a, b, and n. The output should be the result of raising a to the power of b modulo n. (5) division modulo n by finding the modular multiplicative inverse of b. The function should take three inputs: a, b, and n. The output should be the result of dividing a by b modulo n. If the modular inverse of b does not exist, the function should display an error message.
Week 12	Writing and implementing a program using Matlab to (1) calculate the negation of a number modulo n. The function should take two inputs: a and n. The output should be the result of negating a modulo n. (2) calculate the absolute value of a number modulo n. The function should take two inputs: a and n. The output should be the absolute value of a modulo n. (3) perform division modulo n and returns both the quotient and the remainder. The function should take three inputs: a, b, and n. The outputs should be the quotient and the remainder of dividing a by b modulo n.
Week 13	Writing and implementing a program using Matlab to (1) calculate the square root of a number modulo n. The function should take two inputs: a and n. The output should be the square root of a modulo n. (2) calculate the factorial of a number modulo n. The function should take two inputs: a and n. The output should be the factorial of a modulo n. (3) calculate the greatest common divisor of two numbers modulo n. The function should take three inputs: a, b, and n. The output should be the greatest common divisor of a and b modulo n. (4) calculate the least common multiple of two numbers modulo n. The function should take three inputs: a, b, and n. The output should be the least common multiple of a and b modulo n.
Week 14	Writing and implementing a program using Matlab to (1) compare two numbers modulo n. The function should take three inputs: a, b, and n. The output

	should be 1 if a and b are equal modulo n and 0 otherwise. (2) calculate the power of a number modulo n. The function should take three inputs: a, b, and n. The output should be the result of raising a to the power of b modulo n. (3) calculate the power of a number modulo n. The function should take three inputs: a, b, and n. The output should be the result of raising a to the power of b modulo n.
Week 15	Writing and implementing a program using Matlab to (1) perform the bitwise OR operation on two numbers modulo n. The function should take three inputs: a, b, and n. The output should be the result of performing bitwise OR on a and b modulo n. (2) perform the bitwise XOR operation on two numbers modulo n. The function should take three inputs: a, b, and n. The output should be the result of performing bitwise XOR on a and b modulo n. (3) perform the bitwise shift right operation on a number modulo n. The function should take three inputs: a, shift, and n. The output should be the result of performing a bitwise shift right on a by shift bits modulo n.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Miguel A. Lerma, Notes on Discrete Mathematics	no
Recommended Texts		
Websites	https://sites.math.northwestern.edu/~mlerma/courses/cs310-05s/notes/dm-all.pdf	

Grading Scheme

مخطط الدرجات

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

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

automatic rounding outlined above.

Ministry of Higher Education and Scientific Research - Iraq

University of Technology

Department of Applied Sciences

Branch of Mathematics and Computer Applications

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Foundation of Mathematics II**			**Module Delivery**	
Module Type	CORE			✓ **Theory** ✓ **Lecture** ✓ **Tutorial** **Practical** **Seminar**	
Module Code	FOMA122				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	2	
Administering Department	MATH001		**College**	APSC008	

Module Leader	Dr. Raghah Ibrahim Sabri	**e-mail**	raghad.i.sabri@uotechnology.edu.iq
Module Leader's Acad. Title	Assist Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	Dr. Jehad R. Kider	**e-mail**	Jehad.r.kider@uotechnology.edu.iq
Review Committee Approval	09/06/2023	**Version Number**	1.0

Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	4. Demonstrate knowledge of basic concepts and theories from logic, set theory, number theory, relationships. 5. To understand how student knowledge of mathematical proof methods. 6. Knowledge of the student with other types of basic concepts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	8. The student's knowledge of the concept of logical sentences 9. Knowledge of the student about the groups and the operations on these groups. 10. Recognize and describe the mathematical sentences . 11. The student gets acquainted with the subject of foundations of mathematics and its relationship in various fields such as science. and engineering. 12. Summarize what is meant by a basic foundation of mathematics. 13. Discuss the basic definitions and methods reaction and involvement of sets, functions, relations and mapping. 14. Identify the basic theorems of basic sets like natural number , integer numbers and rational Numbers.
Indicative Contents	

المحتويات الإرشادية	Indicative content includes the following. Part A Logic statements (truth table, conjunction, disjunction, negation, Tautology, logical reusing, sentences, Algebra of a proposition, Quantifiers, Components statements, logical analysis, Mathematical proof). (26 hrs) Sets (set concept, equal sets, subsets, Venn diagrams, universal set, finite set, infinite set, Intersection and basic theorem, union, and basic theorem, the difference of two sets with theorems, complement set, relative complement). [26 hrs] Relations (relation concept, Cartesian product, equivalence relation, equivalence class, anti-symmetric relation, type of relation, composition of relations, partial order relation, strict order relation, Partially ordered sets, comparable, Totally ordered sets, well-ordered sets) [26 hrs] Part B - Mappings (Domain and range, surjective mapping, Bijective mapping, equality of mapping, composite mapping, inverse mapping).(15 hrs) The set (Natural number, Construction of natural numbers, pianos axioms, Order on Natural numbers, Mathematical induction, addition definition for Natural number, Theorems of addition operation, Multiplication definition for Natural number, Theorems of multiplication operation, integer numbers, Construction of integer numbers, Addition, and subtraction of integer numbers, Associative law for addition and multiplication).(23 hrs) Groups (Basic definitions and concept of Groups, concept of subgroups, Basic theorems, examples of groups, operation on groups) .[19 hrs] Rational Numbers (Construction of rational numbers, concept of field with some example, Archimedes property, field of rational numbers, order field). [19 hrs]

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

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية				
	Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**

Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Home work		10%(10)		
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Mappings (Domain and range, surjective mapping).
Week 2	Mappings (Bijective mapping, equality of mapping)
Week 3	Mappings (Composite mapping, inverse mapping)
Week 4	The set (Natural number, Construction of natural numbers)
Week 5	The set (Pianos axioms, Order on Natural numbers)
Week 6	The set (Mathematical induction)
Week 7	The set (addition definition for Natural number, Theorems of addition operation)
Week 8	The set (Multiplication definition for Natural number, Theorems of multiplication operation).
Week 9	The set (Integer numbers, Construction of integer numbers, Addition and subtraction of integer numbers)
Week 10	The set (Associative law for addition and multiplication)

Week 11	Groups(Basic definitions and concept of groups, concept of subgroups, Basic theorems)
Week 12	Groups (examples of groups, operation on groups).
Week 13	Rational Numbers (Construction of rational numbers, concept of field with some example)
Week 14	Rational Numbers(Archimedes property, field of rational numbers, order field)
Week 15	**Preparatory Week**
Week 16	**Final Exam**

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

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to the foundations of mathematics , Raymond L. wilder, 2nd edition, John wiley & Sons. Inc. new York. London.Sydney.1967	Yes
Recommended Texts	The Foundations of Mathematics by Kenneth Kunen, College Publications , London, United Kingdom,2007	yes
Websites		

APPENDIX:

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

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

	Ministry of Higher Education and Scientific Research - Iraq University of Technology Department of Applied Sciences **Branch of Applied Physics**	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	GENERAL PHYSICS			**Module Delivery**	
Module Type	BASIC			✓ **Theory**	
Module Code	GEPH124			✓ **Lab**	
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	2	
Administering Department	MATH001		**College**	APSC008	
Module Leader	Dr. Haitham T.Hussein		**e-mail**	Haitham t.hussein@uotechnology.edu.iq	
Module Leader's Acad. Title	Assist Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval	01/06/2023		**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of classic mechanics theory through the application of techniques. 2. To understand what is physics Science, Physical Quantity, unit systems, unit systems and dimensional Analysis. 3. This course deals with the basic concept of mechanics. 4. This is the basic subject for Scalars and Vectors, Coordinate Systems And Vector Representation 5. To understand Motion, distance and displacement,, Instantaneous velocity , also average speed and average velocity. 6. To understanding the Newton's First Law of Motion, Newton's Second Law and Newton's Third Law with applications .		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Discuss the basic properties of classical mechanics with its application in our daily life. 2- Recognize between scalar and vector quantities. 3- Discuss the difference between the Motion in one dimension and two dimensions with examples. 4- Discuss the various terms associated with linear and circular motion. 5- Summarize what is meant the properties of projectile motion. 6- Discuss the Free-fall under gravity. 7- Describe the Mass and Weight and explain the difference between them. 8- Define Newton's Law. 9- Identify the forces and Work. 10- Discuss the relation between the work and kinetic energy. 11- Explain the Work Done by the Gravitational Force. 12- Identify and explain the momentum.		
Indicative Contents			

المحتويات الإرشادية	Indicative content includes the following. Part A - Physics and Measurements physics Science– Unit systems definition, Derived quantities Dimensional Analysis, Scalars and Vectors Coordinate Systems, Unit Vectors and Multiplication of Vector [15 hrs]. Motion in One Dimension– Motion, Distance and Displacement. Average Speed and Average Velocity, Instantaneous velocity, Acceleration, Time Independent Acceleration equation, Free-fall under gravity. [15 hrs] Motion in Two Dimensions- definition of Motion in two dimension with constant acceleration, Properties of Projectile Motion. [10 hrs] Force and Motion- Newton's First, second and third Law of Motions, difference between the Mass and Weight, definitions of Forces, and Types of forces . [15 hrs] Revision problem classes [6 hrs] Part B - Work and kinetic Energy Fundamentals of work and kinetic energy- Work done by a constant force; study the Work done by a varying force, Work Done by the Gravitational Force, explain the Power. [15 hrs] Circular and rotational motion–properties of Circular motion, difference between Circular and rotational motion Angular Displacement, Velocity and Acceleration, and Rotational Work and Kinetic Energy. [7 hrs] Liner Momentum – definition of momentum, conservation of momentum, collisions types, inelastic and elastic collisions. [15 hrs]

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

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	20% (20)	3,6,8,15	LO #1, 2, 3,4and 8
	Assignments	2	5% (5)	7,14	LO # 6

	Projects / Lab.	2	10% (10)		
	Report	1	5% (5)	8	LO # 4
Summative assessment	**Midterm Exam**	2 hr	10% (10)	9	LO # 1-5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - **Physics and Measurements** ,What is physics Science? ,Physical Quantity, Unit systems ,Unit systems and Dimensional Analysis.
Week 2	Define Vectors- Scalars and Vectors, Coordinate Systems, Vector Representation And Vector addition
Week 3	Vector subtraction, vector Components, unit vectors, finding the magnitude and direction of vector and multiplication of vector
Week 4	Motion in one Dimension- Motion, Distance and Displacement, Average Speed and Average Velocity, Instantaneous velocity, and Acceleration
Week 5	Distance, Time and under Constant Acceleration, Time Independent Acceleration equation, and where does this equation come from.
Week 6	Free-fall under gravity.
Week 7	Motion in two dimension- Motion in two dimensions with constant acceleration.
Week 8	difference between one dimension and two dimensions. what is Projectile Motion, Properties of Projectile, state of projectile , Equation of path, and examples .

Week 9	Force and Motion.
Week 10	what is Newton's First Law of Motion, examples , Newton's Second Law, examples, Newton's Third Law,
Week 11	Difference between mass and weight, Units of measurement,
Week 12	Forces, types of forces, examples Work- Work done by a constant force,
Week 13	Work done by a varying force, work done by weight force, examples.
Week 14	Work and Kinetic Energy, Work Done by the Gravitational Force Power-definition of power, examples.
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to the mechanics experiment, General Instructions.
Week 2	Lab 2: Coefficient of Static Friction between two Surfaces
Week 3	Lab 3: prove of Hooke's law and harmonic motion
Week 4	Lab 4: prove the Gravitational force using a simple pendulum
Week 5	Lab 5: Finding the coefficient of liquid viscosity by Stock method
Week 6	Lab 6: measure the Young Modulus
Week 7	Lab 7: Tuning Fork in air

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Serway - Physics for Scientists and Engineers 6e HQ .	Yes
Recommended Texts	Fundamentals of Physics Extended.	No
Websites	https://www.amazon.com/Physics-Scientists-Engineers-PhysicsNOW-InfoTrac/dp/0534408427	

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