MODULE DESCRIPTION FORM

2024-2023

Stage 1 course 1

Module Information معلومات المادة الدراسية					
Module Title	**Calculus (1)**			**Module Delivery**	
Module Type	Core			☒ **Theory** ☒ **Lecture** ☒ **Tutorial** ☐**Lab** ☐ **Practical** ☐ **Seminar**	
Module Code	**OR102**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		**UGI**	**Semester of Delivery**		1
Administering Department		OR	**College**	CSM	
Module Leader	Edrees M. Nori Mahmood		**e-mail**	edreesnori@uomosul.edu.iq	
Module Leader's Acad. Title		Assistant Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Ahmed Naziyah Abdullah		**e-mail**	Ahmed.alkhateeb@uomosul.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		14/02/2024	**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To develop basic mathematical skills necessary for all branches of mathematics. 2. To develop the ability to think in mathematical analysis to solve problems. 3. Introduce the student to the relationship between limits, continuity and derivatives. 4. To learn the rules of differentiation and its applications. 5. To develop the ability to draw curves by making use of all the information that has been studied. 6. To learn the basic rules of integration and its applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding different types of algebraic functions and how to identify them. Also, learn the different identities of algebraic functions. 2. Understanding limits and their relationship to continuity. 3. Understanding the concept of continuity and its relationship to differentiation. 4. The ability to understand differentiation and its rules. 5. Understand the consequences of Rolle's theorem and the Mean Value theorem for differentiable functions. 6. The ability to understand integration and its rules. 7. Employing all the concepts studied in drawing curves and solving mathematical problems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Sets, set representation, real numbers, intervals and their types. [5 hrs] Cartesian coordinate system and some basic concepts in analytic geometry. [5 hrs] Algebraic functions, domain, range, algebraic operations on functions. [10 hrs] Limits. [5 hrs] continuity. [5 hrs] derivatives. [15 hrs] L'Hôpital's first and second rule. [5 hrs] Rolle's theorem, mean value theorem. [5 hrs] Applications of derivatives. [5 hrs] Integration. [10 hrs] Applications of definite integration. [5 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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	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	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Sets, set representation, Real numbers, intervals and their types.
Week 2	Linear and nonlinear inequalities.
Week 3	Cartesian coordinate system and some basic concepts in analytic geometry.
Week 4	Function, types of functions, domain and range of function, graph of function.
Week 5	Algebraic operations on functions, composition of functions, inverse of functions.
Week 6	limits: definition of limit, theorems in limits, computing limits, limits on one side, infinite limits, limits at infinity.
Week 7	The concept of continuity, theorems in continuity, continuity at a point, continuity on an interval.
Week 8	Derivatives: definition, derivative rules, higher order derivatives.

Week 9	Chain rule
Week 10	Implicit functions and their derivatives.
Week 11	L'Hôpital's first and second rule.
Week 12	Rolle's theorem, mean value theorem.
Week 13	Applications of derivatives: increasing functions, decreasing functions, maximum and minimum values of a function.
Week 14	Integration, integration rules, definite integral, the Fundamental Theorem of Calculus.
Week 15	Applications of definite integral in finding the area.
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	مبادئ الرياضيات التفاضل والتكامل للدكتور علي عزيز علي واخرون، 1980 التفاضل والتكامل د. رمضان محمد جهيمة و د. أحمد عبد العالي، 2002 الجزء الأول.	yes
Recommended Texts	Thomas Calculus Schaum's calculus series Calculus of one and several Variaables,11th Edition	yes
Websites	https://www.khanacademy.org/math/calculus-1 https://tutorial.math.lamar.edu/classes/calci/calci.aspx	

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	**الجبر الخطي**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory**	
Module Code	**OR104**			☒ **Lecture**	
ECTS Credits	**6**			☐**Lab**	
SWL (hr/sem)	**150**			☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level		**UGI**	**Semester of Delivery**		**1**
Administering Department		**OR**	**College**	**CSM**	
Module Leader	**هدى عصام احمد**		**e-mail**	**Dr.hudaea@uomosul.edu.iq**	
Module Leader's Acad. Title		**Professor**	**Module Leader's Qualification**		**Ph.D.**

Module Tutor	**حذيفة حازم طه**	**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	**11/06/2023**	**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 Indicativz Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- Providing the student with sufficient information that qualifies him to distinguish realistic situations that can be solved by matrix algebra. 2- Accustoming the student to formulating realistic problems as models in linear algebra. 3- Solving a system of linear equations using linear algebra. 4-To develop students' skills in understanding matrices and arithmetic operations on matrices. 5- Study linear algebra in detail.
Module Learning Outcomes	1- Matrices and arithmetic operations

مخرجات التعلم للمادة الدراسية	2-Finding the inverse of matrices (using elementary transformations - Gaussian elimination) 3- Learn to find the determinant of matrices with small and very large capacities (definition method - modern method - discriminant factor method - elementary transformation method). 4- Solving the non-homogeneous linear system using matrices in the case m=n (Cramer's method - definition method - Gauss's elimination method to find the inverse and solve the system) 5-Solving a non-homogeneous linear system using matrices if the number of equations is less than the number of unknowns 6- Solve the non-homogeneous linear system using matrices if the number of equations is greater than the number of unknowns 7- How to find the rank of square and non-square matrices 8-Using the diacritic formula and how to find the rank of square and non-square matrices -9 Euclidean nth space (Euclidean length - Euclidean distance - Euclidean multiplication - Dicatric multiplication)
Indicative Contents المحتويات الإرشادية	Instructional content includes the following. Part A – Matrices

	Basic concepts and definition of matrices and their types - Arithmetic operations on matrices (addition, subtraction, multiplication) and the properties of those operations - The effect of the matrix and its applications in arithmetic operations - Complex numbers and arithmetic operations on them with their properties - Complex numbers and arithmetic operations on them with their properties - Complex numbers and arithmetic operations on them With its properties- Finding determinants of large capacity matrices - Properties of determinants - Inverses of matrices (using elementary transformations - Gaussian elimination) - Properties of inverses of matrices - Methods of solving systems of non-homogeneous linear equations using the method of Gauss, Gauss-Gordon and Kramer, when the determinant of the matrix is not equal to zero - Equivalent matrices and types of solution to equations Linearity - finding the order of matrices using equivalence - the modal or suppressive formula - defining the nth Euclidean space and some of its theorems - defining the linear structure, the Euclidean length, and the Euclidean distance between two vectors in the nth Euclidean space - finding the characteristic roots and characteristic vectors [75 hours]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Encourage students to participate in exercises, while improving and expanding critical thinking skills at the same time. This will be accomplished through interactive classes and tutorials and by looking at types of simple experiments that include some sampling activities of interest to students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

التقييم التلخيصي					
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Basic concepts and definition of matrices and their types, arithmetic operations on matrices (addition, subtraction, multiplication) and properties of those operations, the effect of the matrix and its applications in arithmetic operations.
Week 2	Complex numbers and arithmetic operations on them with their properties - Complex numbers and arithmetic operations on them with their properties - Complex numbers and arithmetic operations on them with their properties
Week 3	Finding determinants of small capacity matrices
Week 4	Finding the determinants of large capacity matrices - (definition - modern method - discriminant factor method - elementary transformations method).
Week 5	Properties of determinants
Week 6	- Inverse of matrices (using elementary transformations - Gaussian elimination)

Week 7	Properties of inverse matrices-
Week 8	Solving a non-homogeneous linear system using matrices in the case m=n (Cramer's method - definition method - Chaos' elimination method to find the inverse and solve the system)
Week 9	Chaos' elimination method to find the inverse and solve the system
Week 10	Solving a non-homogeneous linear system using matrices if the number of equations is less than the number of unknowns
Week 11	Solving a non-homogeneous linear system using matrices if the number of equations is greater than the number of unknowns
Week 12	- How to find the rank of square and non-square matrices
Week 13	The diacritic formula - The diacritic formula and how to find the rank of square and non-square matrices
Week 14	Nth Euclidean space (Euclidean length - Euclidean distance - Euclidean multiplication - Dicatric multiplication)
Week 15	Definition of linear structure - finding characteristic roots and characteristic vectors

Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts النصوص المطلوبة	**الجبرالخطي تأليف (د.عبدالمجيد حمزة, د.لميعة باقرالجواد)** **الخطي الخبر وتطبيقاته تأليف د. معروف الرحمن**	Yes
Recommended Texts	الجبر الخطي تاليف د. جورج ضايق السبتي(١٩٨٨)	No
Websites	https://youtu.be/ettlYWO0zlg?si=fluQnZKfax7RWWaJ	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performanceأداء مذهل
	B - Very Good	جيد جدا	80 - 89	Above average with some errors فوق المتوسط مع بعض الأخطاء
	C - Good	جيد	70 - 79	Sound work with notable errors العمل السليم مع أخطاء ملحوظة
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings عادل ولكن مع نواقص كبيرة
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria العمل يلبي الحد الأدنى من المعايير
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded مطلوب المزيد من العمل ولكن الائتمان الممنوح
	F – Fail	راسب	(0-44)	Considerable amount of work required

				قدر كبير من العمل المطلوب

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	**Programming (1)**			**Module Delivery**	
Module Type	**Basic**			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	**OR103**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level		**UGI**	**Semester of Delivery**		**1**
Administering Department		**OR**	**College**	**CSM**	
Module Leader	كرم عادل عبد		**e-mail**	karamadel@uomosul.edu.iq	
Module Leader's Acad. Title		**Lecturer**	**Module Leader's Qualification**		**Master**
Module Tutor	كرم عادل عبد		**e-mail**	Hindtalaat48@uomosul.edu.iq	
Peer Reviewer Name		موفق ابراهيم	**e-mail**		
Scientific Committee Approval Date		**11/06/2023**	**Version Number**		**1.0**

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None وحدة المتطلبات الممهدة simulation neural networks	**Semester**	
Co-requisites module	None وحدة المتطلبات المكملة Matlab	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1.To develop problem-solving skills and understanding of programming in general by applying the MATLAB language. 2. This course deals with the basic concepts of programming in the MATLAB language 3. This is the basic topic of all forms of programming. 4. To understand programming problems and ways to solve them using the MATLAB language.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 learning outcomes, preferably equal to the number of weeks of study. 1. Learn how to program in its simplest form. 2. List the different terms specific to the MATLAB language. 3. Summarize what is meant by programming. 4. Discuss programming methods. 5. Learn about basic programming elements and their applications. 6. Discuss the different characteristics of programming. 7. Learn about algorithms and their relationship to programming.
Indicative Contents المحتويات الإرشادية	The indicative contents of MATLAB can be divided into several categories, including: 1. Basics: These contents include learning about the graphical interface of MATLAB Desktop and the tools used in software development, in addition to learning about the basic commands in the language.

	2. Programming concepts: The guidance should contain important concepts in programming, such as conditionals, loops, arrays, and data manipulation. 3. Graphing: The instruction should include an explanation of how to plot data using MATLAB, such as line graphs, pie charts, and 3D graphics. 4. Statistics and data analysis: The guidance can contain an explanation of how to use MATLAB to analyze data and perform statistical operations, such as estimating differential equations, factor analysis, and classification. 5. Machine Learning: Mentorship can also include an explanation of how to use MATLAB to develop machine learning models, such as classification, clustering, and factor analysis models. 6. Achievement applications: The guidance can contain examples and applications of tools and techniques available in MATLAB, such as biostatistics, control, medical imaging, and other fields. In general, the guidance should contain practical examples and exercises that allow the user to apply the concepts and tools explained in practice.[90 h]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy to be adopted in delivering this unit is to encourage students to use the MATLAB language and then engage in exercises, while at the same time improving and expanding their critical thinking skills. This will be accomplished through interactive classes and tutorials and by looking at types of simple experiments that include some sampling activities of interest to students.

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

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	107	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment التقييم التكويني	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment التقييم التلخيصي	**Midterm Exam**	2hr	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	An introductory introduction to the computer and its parts

Week 2	An introductory introduction to programming in the MATLAB language
Week 3	Algorithms
Week 4	Flowcharts and examples
Week 5	An introduction to the matlab system and its features
Week 6	Constants and variables in matlab
Week 7	mathematical calculations
Week 8	Logical and relational operations
Week 9	precedence operations
Week 10	The 'if' conditional sentence with examples
Week 11	Cases of the "if" clause with examples
Week 12	The "for" clause with a variety of examples
Week 13	"while" clause with a variety of examples
Week 14	The break clause with a variety of examples
Week 15	Continuous sentence with a variety of examples
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to programming in general
Week 2	Lab 2: Algorithms
Week 3	Lab 3: An introduction to the matlab system and its features
Week 4	Lab 4: Constants and variables in matlab
Week 5	Lab 5: mathematical calculations

Week 6	Lab 6: Logical and relational operations
Week 7	Lab 7: precedence operations

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts النصوص المطلوبة	1- محمد رفيق علي ," تطبيقات الماتلاب الهندسية ", جامعة البلقاء التطبيقية, 2010 .	Yes
Recommended Texts	The MathWorks, Inc., MATLAB®13 Help, 2020	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance أداء مذهل
	B - Very Good	جيد جدا	80 - 89	Above average with some errors فوق المتوسط مع بعض الأخطاء
	C - Good	جيد	70 - 79	Sound work with notable errors العمل السليم مع أخطاء ملحوظة
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings عادل ولكن مع نواقص كبيرة
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria العمل يلبي الحد الأدنى من المعايير
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded مطلوب المزيد من العمل ولكن الائتمان الممنوح
	F – Fail	راسب	(0-44)	Considerable amount of work required قدر كبير من العمل المطلوب

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**	
Module Code	**OR106**			☒ **Lecture**	
ECTS Credits	**2**			☐ **Lab**	
SWL (hr/sem)	**50**			☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	**UGI**		**Semester of Delivery**	**1**	
Administering Department	**OR**		**College**	**CSM**	
Module Leader	**Zainab Qusay Ahmed Taqi**		**e-mail**	**Zainab.q@uomosul.edu.iq**	
Module Leader's Acad. Title	**Asst. lecturer**		**Module Leader's Qualification**	**master**	
Module Tutor	**None**		**e-mail**	**None**	
Peer Reviewer Name	**None**		**e-mail**	**None**	
Scientific Committee Approval Date	**11/06/2023**		**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 Objectives أهداف المادة الدراسية	1. To be able to speak English fluently and accurately. 2. To think in English and then speak. 3. To be able to compose freely and independently in speech and writing. 4. To be able to read books with understanding.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To address grammar issues that students encounter in their daily speech, writing, reading, and listening. 2. Recognize the structure of the sentence. 3. To address the issue of grammatical errors that affect effective communication 4. To improve your reading skills through the practice of vocabulary enrichment, reading comprehension exercises, speed reading strategies, written responses, discussions, and reflections 5. Develop writing skills.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction: about new headway pre-intermediate plus [1 hrs] Tenses: past-present-future, wh- questions. Vocabulary- using a bilingual dictionary, reading (communication). Everyday English (social expressions) [9 hrs]

	Grammar: Review about tenses, Present tenses, have and have got. Vocabulary: about (daily life), listening and match between verb and nouns. Practices about simple present and present continuous, Reading: about living in the USA. Social expressions about every day English. [8 hrs] Past tenses, simple past and past continuous, practice, Reading and listening, regular and irregular verbs. Vocabulary: about N.- V.- Adj. endings. Everyday English (time expressions). [6hrs] Grammar: the quantities, also about Something/someone/somewhere, practices. Reading: about markets, practices. [6 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- The main strategy that will be adopted in developing the four skills: - The skill of speaking. - The skill of reading. - The skill of writing. - The skill of listening. - Also, enables the students the use grammar correctly.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (15)	4,9 and 11	LO #1, #2 and #5
	Assignments	2	10% (15)	2,10 and 13	LO #3, #4 and #6
	Report	1	10% (10)	13	LO #1, #4
Summative assessment	**Midterm Exam**	1hr	10% (10)	7	LO #1 - #5
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered

Week 1	Introduction: new headway pre-intermediate plus
Week 2	Grammar: Tenses, wh- questions, practices.
Week 3	Vocabulary- how to use a bilingual dictionary, reading about (communication)
Week 4	Everyday English (social expressions), listening, practices.
Week 5	Grammar: Present tenses, have and have got, practices.
Week 6	Vocabulary about (daily life), listening, and match between vocabularies, and practices.
Week 7	Mid-term Exam.
Week 8	simple present and present continuous, practices, reading about living in the USA.
Week 9	Social expressions about everyday English, practices.
Week 10	Grammar: simple past and past continuous tenses, and practices.
Week 11	Reading and listening, regular and irregular verbs, practices.
Week 12	Vocabulary: about N.- V.- Adj. endings, practices, Everyday English (time expressions), practices.
Week 13	Grammar: quantity (some, many, any, much, few,….), practice.
Week 14	Grammar: about Something/someone/somewhere, practices.
Week 15	Reading: about markets, practices.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Headway pre-intermediate plus student's book. (John and Liz Soars)	Yes

Recommended Texts	Headway pre-intermediate plus work's book	Yes
Websites	https://7esl.com/	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Stage 1 course 2

Module Information معلومات المادة الدراسية		
Module Title	**Operations Research (2)**	**Module Delivery**
Module Type	**Core**	☒ **Theory**
Module Code	**OR107**	

ECTS Credits	**6**			☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical**
SWL (hr/sem)	**150**			
Module Level	**UGI**	**Semester of Delivery**	**2**	
Administering Department	**OR**	**College**	**CSM**	
Module Leader	**Oday Abdulrahman Jarjies**	**e-mail**	**odayjarjies@uomosul.edu.iq**	
Module Leader's Acad. Title	**Lecturer**	**Module Leader's Qualification**	**Ph.D.**	
Module Tutor	**Ghazwan Alsoufi**	**e-mail**	**ghazwan.alsoufi@uomosul.edu.iq**	
Peer Reviewer Name	**Name**	**e-mail**	**E-mail**	
Scientific Committee Approval Date	**11/06/2023**	**Version Number**	**1.0**	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Operations Research (1)	**Semester**	1
Co-requisites module	برمجة صحيحة وحركية	**Semester**	3

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and an understanding of operations research through applying formulas to solve some examples. 2. Use mathematical and engineering methods to study optimization problems in Business and Management, Economics, Computer Science, Civil Engineering, Industrial Engineering, etc. 3. This course introduces frameworks and ideas about various types of optimization problems in the business world.

	4. In particular, we focus on how to formulate real business problems into mathematical models that can be solved by computers.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Dual Model 2. Definition of the Dual Problem 3. Solution of the Dual Problem 4. Relationship Between Primal and Dual Objective Values 5. Dual Simplex Method 6. Economic interpretation of the corresponding model 7. Interpreting the Simplex Tableau : Sensitivity Analysis 8. Post optimal or Sensitivity Analysis 9. Changes Affecting Optimality 10. Changes Affecting Feasibility 11. Changes Affecting Optimality and Feasibility 12. Parametric Linear Programming 13. Mathematical Foundations 14. Standard LP Model in Matrix Form 15. Revised (Primal) Simplex Method 16. Steps of the Primal Revised Simplex Method
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A- Dual Problem [10 hrs] • Definition of the Dual Problem • Constraints • Data • Objective Functions Part B- Solution of the Dual Problem [15 hrs] • Relationship Between Primal and Dual Objective Values • Dual Simplex Method • Economic interpretation of the corresponding model Part C-Sensitivity Analysis [25 hrs] • Post optimal or Sensitivity Analysis • Changes Affecting Optimality • Changes Affecting Feasibility • Changes Affecting Optimality and Feasibility

	<u>Part D- Parametric Linear Programming [10 hrs]</u> • Changes in C • Changes in B • Changes in Pj • Simultaneous Changes in C and b • Mathematical Foundations • Standard LP Model in Matrix Form • Basic Solution and Bases • The Simplex Tableau in Matrix Form <u>Part E- Revised (Primal) Simplex Method [10 hrs]</u> • Product Form of the Inverse • Steps of the Primal Revised Simplex Method <u>Part F- tools [5 hrs]</u> • The linear programming problem can be solved using different methods, such as the Dual Simplex Method, Sensitivity Analysis, or by using tools such as WINQSB, LINGO, QMP, open solver etc.

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

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
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	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (10)	4 and 10	LO #1- #4 and #9-#12
	Assignments	1	10% (10)	5	LO #1- #4
	Report	1	10% (10)	13	LO #1- #12
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #8
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Dual Model and Definition of the Dual Problem
Week 2	Solution of the Dual Problem
Week 3	Relationship Between Primal and Dual Objective Values

Week 4	Dual Simplex Method
Week 5	Economic interpretation of the corresponding model
Week 6	Interpreting the Simplex Tableau : Sensitivity Analysis
Week 7	Numerical examples
Week 8	Parametric Linear Programming
Week 9	Numerical examples
Week 10	Mathematical Foundations and Standard LP Model in Matrix Form
Week 11	Numerical examples
Week 12	Revised (Primal) Simplex Method
Week 13	Numerical examples
Week 14	Product Form of the Inverse
Week 15	Steps of the Primal Revised Simplex Method
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	حمدي طه	Yes
Recommended Texts	1-مقدمة في نماذج البرمجة الخطية بين النظرية والتطبيق , سعد النعيمي. 2-بحوث العمليات , احمد حاتم عبدالله	No
Websites	https://www.tutorialsduniya.com/notes/linear-programming-applications-notes/	

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	Principle of Statistics			**Module Delivery**	
Module Type	Basic			☒ **Theory** ☒ **Lecture** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**OR110**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		**UGI**	**Semester of Delivery**		**2**
Administering Department		**OR**	**College**	**CSM**	

Module Leader	**Zahraa Alnuaimi**	**e-mail**	**Zahraaalnuaimi2019@uomosul.edu.iq**
Module Leader's Acad. Title	**lecturer**	**Module Leader's Qualification**	**Ph.D.**
Module Tutor	**Zainab Tawfek**	**e-mail**	**Zainab .Tawfeek@uomosul.edu.iq**
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	**11/06/2023**	**Version Number**	**1.0**

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None Requirements module smoother	**Semester**	
Co-requisites module	None Complementary requirements unit	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Introducing the student to the subject of statistics and its relationship to other subjects -1 Introducing the student to basic concepts such as the arithmetic mean, median, and mode, the relationship between them, and the disadvantages and advantages of each -2 Introducing the student to the geometric, harmonic, and quadratic means and the relationship between them -3 Introducing the student to variance, standard deviation, and coefficient of variation -4 Teaching the student to compose statistical tables and calculate the above concepts for them -5 Teaching the student to represent data and also introducing the student to the concept of permutations and combinations -6
Module Learning Outcomes	1- Teaching the student to deal with data and put it in statistical tables 2-The student will be able to find statistical measures such as the rate, variance, geometric mean, harmonic, and squared data for classified and non-classified

مخرجات التعلم للمادة الدراسية	.data 3-The student will be able to find the median and the mode 4-The student will be able to represent data using graphical forms such as histograms, histograms, and circles 5-The student will be able to read his results by calculating the arithmetic mean, variance, etc. 6-The student will be able to understand combinations, permutations, and the relationship between them
Indicative Contents المحتويات الإرشادية	Instructional content includes the following: Chapter one. the introduction. The emergence and development of statistics. Definition of statistics and its application areas. The statistical method in scientific research and the research design method [4 hours] Chapter II. Collect, classify and tabulate data. Data collection method (comprehensive recording, samples). Data collection methods (direct collection, questionnaire) [4 hours] Classification and tabulation of data. Sampling [3 hours] Chapter III. Frequency distributions and data presentation methods. Random variables (discrete and continuous) Quality and quantity). Tabular presentation of data (frequency distribution/relative [frequency distribution) [10 hours Paired frequency distribution/clustered frequency distributions. Geometric display (bar/rectangular/circle/line) (histogram, histogram, polygon) (clustered histograms) Shapes of frequency distributions (symmetric and asymmetric) [6 hours] the fourth chapter. Measures of central tendency. Addition and multiplication symbols. The concept of averages and the purpose of calculating them. Average calculation. Geometric mean. The compromise middle. The square mean and the relationship between them. The mediator and the mode. (Disadvantages and advantages of the milieus, medium, and mode). Choosing the appropriate measure of central tendency [6 hours]

	Chapter V . Measures of dispersion. The concept of dispersion and the purpose of calculating it. Calculate variance. Calculate the standard deviation (for ungrouped and tabulated data). Common variance. Coefficient of variation [6 hours] Relative dispersion coefficients. Permutations. Combinations. The relationship between permutations and combinations. [6 hours]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy to be adopted in delivering this unit is to encourage students to engage in exercises, while at the same time improving and expanding their critical thinking skills. This will be achieved through interactive classes and tutorials

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem)	100		

الحمل الدراسي الكلي للطالب خلال الفصل	

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment التقييم التكويني	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment التقييم التلخيصي	**Midterm Exam**	2hr	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	**Chapter one. the introduction. The emergence and development of statistics. Definition of statistics and its application areas**
Week 2	**The statistical method in scientific research and the research design method**
Week 3	**Chapter II. Collect, classify and tabulate data. Data collection methods (comprehensive registration/sampling). Data collection methods (direct collection/questionnaire). Data classification and tabulation. Selection of samples**
Week 4	**Chapter III. Frequency distributions and data presentation methods. Random variables (discrete and continuous). (Quality, quantity). Tabular display of data (frequency distribution/relative frequency distribution)**

Week 5	**Paired frequency distribution / distributions (clustered frequency). Geometric display (bar graph / rectangle graph / graph circle / line)(histogram. frequency polygon)**
Week 6	**Clustered frequency curves. Forms of frequency distributions (symmetric and asymmetric)**
Week 7	**Chapter Four. Measures of central tendency. Addition and multiplication symbols. The concept of averages and the purpose of calculating them. Arithmetic mean . How to calculate unclassified and classified variables. Defects . Advantages**
Week 8	**The advantages are the geometric mean. Harmonic mean. The square mean. Methods for calculating these averages. Disadvantages and advantages. The relationship between these averages and their relationship with the arithmetic mean**
Week 9	**Mediator . Loom. Calculation method. Defects. Advantages. The relationship with the arithmetic mean. Choosing an appropriate measure of central tendency**
Week 10	**Chapter V. Measures of dispersion. The concept of dispersion. The goal of calculating it**
Week 11	**variance. standard deviation. calculation method . Defects. Advantages. Covariance**
Week 12	**Relative dispersion coefficients. Coefficient of variation. Standard score**
Week 13	**Calculating the variance of classified data. Calculate the standard deviation of tabulated data**
Week 14	**Relative dispersion coefficients**
Week 15	**Permutations. Combinations. The relationship between permutations and combinations.**
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 النصوص المطلوبة	الإحصاء/د. محمود حسن المشهداني/امير حنا هرمز /جامعه بغداد 2- المدخل إلى الإحصاء/د. خاشع الراوي/ جامعه الموصل 3- Allan G. Bluman/2012 /Elementary	yes
Recommended Texts	1- مبادئ الإحصاء. احمد عبد السميع،دار اليازوري العلمية للنشر، 2008 2- مبادئ الإحصاء. الدكتور طه حسين الزبيدي، دار غيداء للنشر، 2012	No
Websites	https://books-library.net/c-Statistics-download	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performanceأداء مذهل
	B - Very Good	جيد جدا	80 - 89	Above average with some errors فوق المتوسط مع بعض الأخطاء
	C - Good	جيد	70 - 79	Sound work with notable errors العمل السليم مع أخطاء ملحوظة
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings عادل ولكن مع نواقص كبيرة
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria العمل يلبي الحد الأدنى من المعايير
Fail Group	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)				مطلوب المزيد من العمل ولكن الائتمان الممنوح
	F – Fail	راسب	(0-44)	Considerable amount of work required قدر كبير من العمل المطلوب

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Applications**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**OR112**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		**UGI**	**Semester of Delivery**		2
Administering Department		**OR**	**College**		**CMS**
Module Leader	**Mowafeq Ibrahim Hasan**		**e-mail**		**Mwafaq.ibrahim@uomosul.edu.iq**
Module Leader's Acad. Title		Assistant lecturer	**Module Leader's Qualification**		**M.Sc**
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		**11/06/2023**	**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 Objectives أهداف المادة الدراسية	1. Improved Communication: Fast communication can help increase productivity, allow for better business decisions and facilitate company expansion into new regions or countries. The movement of information within organizations or companies has become instantaneous. Employees can easily transfer data across departments without any interruption. Tools such as email, electronic fax, mobile phones, and text messages enhance the movement of information data between employees, customers, and business partners or suppliers, allowing for greater connectivity across internal and external structures. 2. • Improved Communication: Fast communication can help increase productivity, allow for better business decisions and facilitate company expansion into new regions or countries. The movement of information within organizations or companies has become instantaneous. Employees can easily transfer data across departments without any interruption. Tools such as email, electronic fax, mobile phones, and text messages enhance the movement of information data between employees, customers, and business partners or suppliers, allowing for greater connectivity across internal and external structures. 3. Work: Streamlined workflow systems, shared storage, and collaborative workspaces can increase business efficiency and allow employees to process a greater level of work in a shorter period of time. Information technology systems can be used to automate routine tasks, to facilitate data analysis and to store data in a way that can be easily retrieved for future use. Technology can also be used to answer customer questions through email, in a real-time chat session, or through a phone routing system that connects the customer to an available customer service agent. 4. Cost Reduction and Economic Efficiency: Communication technology and social technology have made business promotion and product launch affordable. Many small businesses have found ways to use social technology to increase their brand awareness and get more customers for less. In business, factors such as operating cost play an important role in business development and growth. So when companies use information technology to reduce operating costs, the return on investment will increase, which will lead to business growth.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Enhancing the ability of information technology to adapt and respond to the multiple, renewable and constantly changing needs of all parties benefiting from the outputs of the information system, especially the university leaders in the researched university, and thus enables information technology to carry out its work efficiently and effectively. Predicting the studied phenomenon in the future by means of Box-Jenkins model. 2. Employing information technologies in the axes of the educational process worked to build a bridge of vital communication between faculty members and all sources of the educational process, and this necessarily means facilitating the teacher's task in delivering information to the student within an interactive technical environment, and information technologies provide multiple sources in order to

	obtain information Whether it is from sources within the university or from the Internet and the educational technologies it contains.
Indicative Contents المحتويات الإرشادية	Although the information technology specialization is one of the most demanded fields currently in all global markets, some specializations range from stagnant to saturated and required, so you should study the market well before choosing a specialization. But if you are looking for the best majors that have a future in the field of information technology, then they are as follows: Network security major in programming - software engineering - 3D printing - data science major - Artificial Intelligence - Computer Science - Aerospace Engineering

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 by Using appropriate teaching strategies and methods and teaching aids to develop thinking skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Getting to know the computer and the history of its stages of development - indicating the types of computers - installing the computer - defining the physical parts
Week 2	Data entry units and data output units to the computer - The central processing unit and its tasks
Week 3	Primary and secondary memories - Types of displays
Week 4	Software
Week 5	Computer operating systems
Week 6	Low-level languages and high-level languages
Week 7	Service application software

Week 8	Getting to know the Word program - How to open or run the program - Transforming the Word program interface - Word program menus.
Week 9	Home Toolbar - Home Page Insert Menu - Toolbar - Insert Menu - Page Layout
Week 10	Microsoft Excel - the most common uses of the Excel program - opening the Excel program - closing the Excel program - an explanation of the main toolbar of the Excel program
Week 11	Entering data in Excel program - how to navigate in a worksheet - inserting a function from the ready-made functions into a cell - examples - shading cells - clearing cells
Week 12	The basics of building a POWER POINT presentation - entering the program and the program interface - creating a new presentation
Week 13	Open a presentation file - save a presentation - insert a new slide - add shapes to the slide - slide margins - slide design - add animations to the slide
Week 14	Internet - services provided by the Internet - keywords, comprehensive search engines
Week 15	Create an E-mail
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Lab 1	Word applications
Lab 2	Applications on Excel
Lab 3	Power Point applications
Lab 4	E-mail applications

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

Required Texts	Fundamentals of Information Technology	Yes
Recommended Texts	Glend Gay and Ronald B., "Information Technology", 3 rd Ed, CSEC,OUP Oxford ,2019.	Yes
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Calculus (2)**			**2 Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**OR108**			☒ **Lecture**	
ECTS Credits	**6**			☒ **Tutorial**	
SWL (hr/sem)	**150**			☐ **Lab**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	**UGI**	**Semester of Delivery**	**2**		
Administering Department	**OR**	**College**	**CSM**		
Module Leader	**Edrees M. Nori Mahmood**	**e-mail**	**edreesnori@uomosul.edu.iq**		
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	**Ph.D.**		
Module Tutor	**Ahmed Naziyah Abdullah**	**e-mail**	**Ahmed.alkhateeb@uomosul.edu.iq**		
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	14/02/2024	**Version Number**	1.0		

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Calculus (1)	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives	7. To develop basic mathematical skills necessary for all branches of mathematics.

أهداف المادة الدراسية	8. To develop the ability to think in mathematical analysis to solve problems. 9. learn the techniques of differentiation of functions such as trigonometric, inverse trigonometric, exponential, logarithmic, and hyperbolic functions. 10. Studying integration methods and identify the most appropriate method. 11. understanding the concept of functions in multiple variables. 12. To learn to find the partial derivatives of functions in two variables. 13. To learn to find extrema of functions in two variables 14. To learn calculate double integrals.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	8. Understand the properties of transcendental functions and how to identify them. 9. The ability to find derivatives and integrals of transcendental functions. 10. Training the students on integration methods and evaluating the most appropriate method to find it. 11. Understanding multivariate functions. 12. The ability to find partial derivatives. 13. The ability to identify and find extreme values of functions in two variables. 14. The ability to understand and evaluate double integrals. 15. Employing the concept of double integrals in solving mathematical problems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Trigonometric functions. [5 hrs] Inverse trigonometric functions. [5 hrs] Exponential functions. [5 hrs] Logarithmic functions. [5 hrs] Hyperbolic functions. [5 hrs] Methods of Integration. [15 hrs] Functions of Several Variables. [5 hrs] Partial derivatives. [10 hrs] Extreme values of functions in two variables [5 hrs] Double integrals. [5 hrs] Applications of double integration. [5 hrs] Polar coordinates. [5 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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	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	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2, #3, #4, #5, #6
	Assignments	2	10% (10)	2 and 12	LO #1, #2, #3, #4, #5, #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #4, #5, #6, #7

Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Trigonometric functions, derivatives and integrations.
Week 2	Inverse trigonometric functions, derivatives, integrals resulting in inverse trigonometric functions
Week 3	Exponential functions, domain, range, and its properties, derivatives and integrations.
Week 4	Logarithmic functions, domain, range, and its properties, derivatives of logarithmic functions
Week 5	Hyperbolic functions, derivatives and integrations.
Week 6	Methods of Integration: Integration by parts, integrals of powers of trigonometric functions, trigonometric substitutions.
Week 7	Methods of Integration: integration by substitution, other substitutions.
Week 8	Methods of Integration: integration by partial fractions, integrals of quadratic formulas.
Week 9	Functions of Several Variables: Functions of two Variables, domain and range.
Week 10	Partial derivatives of functions of two variables.
Week 11	second-order partial derivatives of functions of two variables.
Week 12	Extreme values of functions in two variables.
Week 13	Double integrals
Week 14	Applications of double integration (finding area, volume, mass, centers of mass, and …).
Week 15	Polar coordinates, relationship between polar and cartesian coordinates.
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	مبادئ الرياضيات التفاضل والتكامل للدكتور علي عزيز علي واخرون. التفاضل والتكامل د. رمضان محمد جهيمة و د. أحمد عبد العالي، 2002 الجزء الأول + الجزء الثاني	yes
Recommended Texts	Thomas Calculus Schaum's calculus series Calculus of one and several Variaables,11th Edition	yes
Websites	https://www.khanacademy.org/math/calculus-1 https://tutorial.math.lamar.edu/classes/calci/calci.aspx https://www.khanacademy.org/math/calculus-2 https://tutorial.math.lamar.edu/classes/calcII/calcII.aspx https://tutorial.math.lamar.edu/classes/calciii/multivrblefcns.aspx	

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	**Programming (2)**	**Module Delivery**
Module Type	**Basic**	☒ **Theory**
Module Code	**OR109**	☒ **Lecture**
ECTS Credits	**8**	☒ **Lab**
SWL (hr/sem)	**200**	☐ **Tutorial**

			☐ Practical ☐ Seminar	
Module Level		**UGI**	**Semester of Delivery**	**2**
Administering Department		**OR**	**College**	**CSM**
Module Leader	**كرم عادل عبد**		**e-mail**	**karamadel@uomosul.edu.iq**
Module Leader's Acad. Title		**lecture**	**Module Leader's Qualification**	**ماجستير**
Module Tutor	**كرم عادل عبد**		**e-mail**	**Hindtalaat48@uomosul.edu.iq**
Peer Reviewer Name		**موفق ابراهيم**	**e-mail**	**manalsalim@uomosul.edu.iq**
Scientific Committee Approval Date		**11/06/2023**	**Version Number**	**1.0**

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Programming (1)	**Semester**	1
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. To develop problem-solving skills and understanding of programming in general by applying the Matlab language. 2. This course deals with the basic concepts of programming in the Matlab language 3. This is the basic topic of all forms of programming. 4. To understand programming problems and ways to solve them using the MATLAB language.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 learning outcomes, preferably equal to the number of weeks of study. 1. Learn how to program in its simplest form. 2. List the different terms specific to the MATLAB language. 3. Summarize what is meant by programming. 4. Discuss programming methods.

	5. Learn about basic programming elements and their applications. 6. Discuss the different characteristics of programming. 7. Learn about algorithms and their relationship to programming.
Indicative Contents المحتويات الإرشادية	The indicative contents of MATLAB can be divided into several categories, including: 1. Basics: These contents include learning about the graphical interface of MATLAB Desktop and the tools used in software development, in addition to learning about the basic commands in the language. 2. Programming concepts: The guidance should contain important concepts in programming, such as conditionals, loops, arrays, and data manipulation. 3. Graphing: The instruction should include an explanation of how to plot data using MATLAB, such as line graphs, pie charts, and 3D graphics. 4. Statistics and data analysis: The guidance can contain an explanation of how to use MATLAB to analyze data and perform statistical operations, such as estimating differential equations, factor analysis, and classification. 5. Machine Learning: Mentorship can also include an explanation of how to use MATLAB to develop machine learning models, such as classification, clustering, and factor analysis models. 6. Achievement applications: The guidance can contain examples and applications of tools and techniques available in MATLAB, such as biostatistics, control, medical imaging, and other fields. In general, the guidance should contain practical examples and exercises that allow the user to apply the concepts and tools explained in practice.[90 h]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم	
Strategies	The main strategy to be adopted in delivering this unit is to encourage students to use the MATLAB language and then engage in exercises, while at the same time improving and expanding their critical thinking skills. This will be accomplished through interactive classes and tutorials and by looking at types of simple experiments that include some sampling activities of interest to students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	107	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment التقييم التكويني	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment التقييم التلخيصي	**Midterm Exam**	2hr	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	General introduction to matrices
Week 2	Inserting and addressing arrays
Week 3	Types of arrays
Week 4	Operations on arrays
Week 5	Solve various examples of matrices
Week 6	Solve various examples of matrices using the dash "if" statement and the "for" statement
Week 7	Pre-packaged functions with (private) arrays
Week 8	Generate matrices
Week 9	Rotate and reshape matrices
Week 10	Expanding arrays
Week 11	Partial matrices
Week 12	Changing the array elements while deleting some array elements
Week 13	Introduction to drawing in MATLAB
Week 14	Drawing in the "Matlab" system in two dimensions
Week 15	Drawing in the "Matlab" system in three dimensions
Week 16	**Preparatory week before the final Exam**

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

Week 1	Lab 1: General introduction to arrays
Week 2	Lab 2: Entering and addressing arrays
Week 3	Lab 3: types of arrays
Week 4	Lab 4: operations on arrays
Week 5	Lab 5: Solve various examples of matrices
Week 6	Lab 6: Solve various examples of matrices using the conditional "if" and "for" statements
Week 7	Lab 7: Functions ready with (special) matrices
Week 8	Lab 8: Generating Matrices
Week 9	Lab 9: Rotate and reshape the matrix
Week 10	Lab 10: Expanding Matrices
Week 11	Lab 11: Partial matrices
Week 12	Lab 12: Changing matrix elements
Week 13	Lab 13: Drawing in MATLAB in two dimensions
Week 14	Lab 14: Drawing in MATLAB in three dimensions
Week 15	Lab 15: General review

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts النصوص المطلوبة	2- محمد رفيق علي ," تطبيقات الماتلاب الهندسية ", جامعة البلقاء التطبيقية, 2010 .	Yes
Recommended Texts	The MathWorks, Inc., MATLAB®13 Help, 2020	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performanceأداء مذهل
	B - Very Good	جيد جدا	80 - 89	Above average with some errors فوق المتوسط مع بعض الأخطاء
	C - Good	جيد	70 - 79	Sound work with notable errors العمل السليم مع أخطاء ملحوظة
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings عادل ولكن مع نواقص كبيرة
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria العمل يلبي الحد الأدنى من المعايير
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded مطلوب المزيد من العمل ولكن الائتمان الممنوح
	F – Fail	راسب	(0-44)	Considerable amount of work required قدر كبير من العمل المطلوب

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.