MODULE DESCRIPTION FORM

**2023-2024**

Stage 1 course 1

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| **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 | |

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

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| **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.   1. 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.   1. Understanding limits and their relationship to continuity. 2. Understanding the concept of continuity and its relationship to differentiation. 3. The ability to understand differentiation and its rules. 4. Understand the consequences of Rolle’s theorem and the Mean Value theorem for   differentiable functions.   1. The ability to understand integration and its rules. 2. 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] |

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

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| **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 | | |

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| **Module Evaluation**  **تقييم المادة الدراسية** | | | | | |
| **As** | | **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) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| **Week** | **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** |

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

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| **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> | |

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| **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 |
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| **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

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| **Module Information**  **معلومات المادة الدراسية** | | | | | | | |
| **Module Title** | **الجبر الخطي** | | | | **Module Delivery** | | |
| **Module Type** | **Basic** | | | | * **☒ Theory** * **☒ Lecture** * **☐Lab** * **☒ Tutorial** * **☐ Practical** * **☐ Seminar** | | |
| **Module Code** | **OR104** | | | |
| **ECTS Credits** | **6** | | | |
| **SWL (hr/sem)** | **150** | | | |
| **Module Level** | | **UGI** | **Semester of Delivery** | | | | **1** |
| **Administering Department** | | **OR** | **College** | **CSM** | | | |
| **Module Leader** | **هدى عصام احمد** | | **e-mail** | [**Dr.hudaea@uomosul.edu.iq**](mailto:Dr.hudaea@uomosul.edu.iq) | | | |
| **Module Leader’s Acad. Title** | | **Professor** | **Module Leader’s Qualification** | | | | **Ph.D.** |
| **Module Tutor** | **حذبفة حازم طه** | | **e-mail** |  | | | |
| **Peer Reviewer Name** | |  | **e-mail** |  | | | |
| **Scientific Committee Approval Date** | | **11/06/2023** | **Version Number** | | | **1.0** | |

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

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| **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**  **مخرجات التعلم للمادة الدراسية** | 1- Matrices and arithmetic operations  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] |

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| **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. |

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| **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 | | |

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| **Module Evaluation**  **تقييم المادة الدراسية** | | | | | |
| **As** | | **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) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| **Week** | **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** |

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| **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> | |

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| **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 errorsفوق 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 |
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| **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

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| **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** | |

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| **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** |  |

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| **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] |

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| **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. |

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| **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** | | |

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| **Module Evaluation**  **تقييم المادة الدراسية** | | | | | |
| **As** | | **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) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| **Week** | **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** |

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| **Delivery Plan (Weekly Lab. Syllabus)**  **المنهاج الاسبوعي للمختبر** | |
| **Week** | **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 |

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| **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 | |
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| **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

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| **Module Information**  **معلومات المادة الدراسية** | | | | | | | |
| **Module Title** | **English Language** | | | | **Module Delivery** | | |
| **Module Type** | **Support** | | | | * **☐ Theory** * **☒ Lecture** * **☐ Lab** * **☒ Tutorial** * **☐ Practical** * **☐ Seminar** | | |
| **Module Code** | **OR106** | | | |
| **ECTS Credits** | **2** | | | |
| **SWL (hr/sem)** | **50** | | | |
| **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** | |

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

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| **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] |
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| **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. |

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| **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** | | |

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| **Module Evaluation**  **تقييم المادة الدراسية** | | | | | |
| **As** | | **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) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| **Week** | **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** |

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| **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/> | |

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| **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 |
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| **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

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| **Module Information**  **معلومات المادة الدراسية** | | | | | | | |
| **Module Title** | Operations Research (2) | | | | **Module Delivery** | | |
| **Module Type** | Core | | | | * **☒ Theory** * **☒ Lecture** * **☐ Lab** * **☒ Tutorial** * **☐ Practical** | | |
| **Module Code** | OR107 | | | |
| **ECTS Credits** | 6 | | | |
| **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**](mailto: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**](mailto:ghazwan.alsoufi@uomosul.edu.iq) | | | |
| **Peer Reviewer Name** | | **Name** | **e-mail** | **E-mail** | | | |
| **Scientific Committee Approval Date** | | **11/06/2023** | **Version Number** | | | **1.0** | |

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| **Relation with other Modules**  **العلاقة مع المواد الدراسية الأخرى** | | | |
| **Prerequisite module** | Operations Research (1) | **Semester** | 1 |
| **Co-requisites module** | برمجة صحيحة وحركية | **Semester** | 3 |

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| **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   Part D- Parametric Linear Programming [10 hrs]   * 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   Part E- Revised (Primal ) Simplex Method [10 hrs]   * Product Form of the Inverse * Steps of the Primal Revised Simplex Method   Part F- tools [5 hrs]   * 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. |

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

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| **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** | | |

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| **Module Evaluation**  **تقييم المادة الدراسية** | | | | | |
| **As** | | **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) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| **Week** | **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 |

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| **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/> | |

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| **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 |
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| **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

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| **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** | |

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

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| **Module Aims, Learning Outcomes and Indicative Contents**  **أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية** | |
| **Module Objectives**  **أهداف المادة الدراسية** | 1- Introducing the student to the subject of statistics and its relationship to other subjects  2- 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  3- Introducing the student to the geometric, harmonic, and quadratic means and the relationship between them  4- Introducing the student to variance, standard deviation, and coefficient of variation  5- Teaching the student to compose statistical tables and calculate the above concepts for them  6- Teaching the student to represent data and also introducing the student to the concept of permutations and combinations |
| **Module Learning Outcomes**  **مخرجات التعلم للمادة الدراسية** | 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 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] |

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| **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 |

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| **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)**  **الحمل الدراسي الكلي للطالب خلال الفصل** | **100** | | |

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| **Module Evaluation**  **تقييم المادة الدراسية** | | | | | |
| **As** | | **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) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| **Week** | **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** |

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

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| **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> | |

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| **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 |
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| **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

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| **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 | |

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

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| **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 |

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| **Learning and Teaching Strategies**  **استراتيجيات التعلم والتعليم** | |
| **Strategies** | The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials by Using appropriate teaching strategies and methods and teaching aids to develop thinking skills. |

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| **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** | | |

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| **Module Evaluation**  **تقييم المادة الدراسية** | | | | | |
| **As** | | **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) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| **Week** | **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** |

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

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| **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** |  | |

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| **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 |
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| **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

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| **Module Information**  **معلومات المادة الدراسية** | | | | | | | |
| **Module Title** | **Calculus (2)** | | | | **2 Module Delivery** | | |
| **Module Type** | **Core** | | | | * **☒ Theory** * **☒ Lecture** * **☒ Tutorial** * **☐ Lab** * **☐ Practical** * **☐ Seminar** | | |
| **Module Code** | **OR108** | | | |
| **ECTS Credits** | **6** | | | |
| **SWL (hr/sem)** | **150** | | | |
| **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 | |

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| **Relation with other Modules**  **العلاقة مع المواد الدراسية الأخرى** | | | |
| **Prerequisite module** | Calculus (1) | **Semester** | 1 |
| **Co-requisites module** | None | **Semester** |  |

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| **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. learn the techniques of differentiation of functions such as trigonometric, inverse trigonometric, exponential, logarithmic, and hyperbolic functions. 4. Studying integration methods and identify the most appropriate method. 5. understanding the concept of functions in multiple variables. 6. To learn to find the partial derivatives of functions in two variables. 7. To learn to find extrema of functions in two variables 8. To learn calculate double integrals. | | | |
| **Module Learning Outcomes**  **مخرجات التعلم للمادة الدراسية** | 1. Understand the properties of transcendental functions and how to identify them. 2. The ability to find derivatives and integrals of transcendental functions. 3. Training the students on integration methods and evaluating the most appropriate   method to find it.   1. Understanding multivariate functions. 2. The ability to find partial derivatives. 3. The ability to identify and find extreme values of functions in two variables. 4. The ability to understand and evaluate double integrals. 5. 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 | | |

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| **Module Evaluation**  **تقييم المادة الدراسية** | | | | | |
| **As** | | **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) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| **Week** | **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** |

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

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| **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 | |
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| **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

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| **Module Information**  **معلومات المادة الدراسية** | | | | | | | |
| **Module Title** | **Programming (2)** | | | | **Module Delivery** | | |
| **Module Type** | **Basic** | | | | * **☒ Theory** * **☒ Lecture** * **☒ Lab** * **☐ Tutorial** * **☐ Practical** * **☐ Seminar** | | |
| **Module Code** | **OR109** | | | |
| **ECTS Credits** | **8** | | | |
| **SWL (hr/sem)** | **200** | | | |
| **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** | |

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| **Relation with other Modules**  **العلاقة مع المواد الدراسية الأخرى** | | | |
| **Prerequisite module** | Programming (1) | **Semester** | 1 |
| **Co-requisites module** | None | **Semester** |  |

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| **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] |

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| **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. |

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| **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** | | |

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| **Module Evaluation**  **تقييم المادة الدراسية** | | | | | |
| **As** | | **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) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  **المنهاج الاسبوعي النظري** | |
| **Week** | **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** |

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| **Delivery Plan (Weekly Lab. Syllabus)**  **المنهاج الاسبوعي للمختبر** | |
| **Week** | **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 |

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| **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 | |

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| **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 |
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| **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. | | | | |