MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

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| **Module Information**  معلومات المادة الدراسية | | | | | | | |
| **Module Title** | Computer programming and applications MATLAB-beginner | | | | **Module Delivery** | | |
| **Module Type** | Basic | | | | **☒ Theory**   * **Lecture**   **☒ Lab**   * **Tutorial** * **Practical** * **Seminar** | | |
| **Module Code** | MIE12207 | | | |
| **ECTS Credits** | 3 | | | |
| **SWL (hr/sem)** | 90 | | | |
| **Module Level** | | UGII | **Semester of Delivery** | | | | 3 |
| **Administering Department** | | MIE | **College** | MUC | | | |
| **Module Leader** | Yusra Mohammed kwyja | | **e-mail** | yusra.mohammed@muc.edu.iq | | | |
| **Module Leader’s Acad. Title** | | Lecture | **Module Leader’s Qualification** | | | | PhD |
| **Module Tutor** |  | | **e-mail** |  | | | |
| **Peer Reviewer Name** | Dr. Noor Kadhim Meftin | | **e-mail** | noor.kadhim@muc.edu.iq | | | |
| **Scientific Committee Approval Date** | 17/6/2023 | | **Version Number** | | | 1.0 | |

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

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| **Module Aims, Learning Outcomes and Indicative Contents**  أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية | |
| **Module Aims**  أهداف المادة الدراسية | 1. Understanding the fundamental concepts of MATLAB programming language environment. 2. The students will understand and learn how to use MATLAB as an effective programming language. 3. The students will be able to solve different mathematical and engineering problems as well as using plotting functions and design projects using codes or GUI. 4. Students will acquire the knowledge of basic MATLAB syntax such as: variables, input, output, vectors, matrices, functions, plotting, and GUI, 5. The students will gain the necessary skills to design and implements appropriate algorithms that solve problems dealing with different mathematical and engineering applications. |
| **Module Learning Outcomes**  مخرجات التعلم للمادة الدراسية | 1. Understand the MATLAB environments and windows (Command Window, Workspace Window, Command History window, Help Window, Editor Window). 2. The students learn how to write first program and learn Expressions, Constants, Entering Matrices, Useful Matrix Generators, Subscripting, End as a subscript, Colon Operator, Transpose Deleting Rows or Columns. 3. Explain how to use variables and assignment statement, logical operator. 4. Practice on using Arrays, Built in functions, Basic Matrix Functions(sum, max, min, mean, magic, diag, length, size, median, prod, sort). 5. Learn how to perform basic Plotting (Multiple Data Sets in One Graph, Specifying Line Styles and Colors, Multiple Plots in One Figure, Setting Axis Limits). 6. Understand arguments and return values, M-file, input-output statement. 7. Train on using control Statements (Conditional statements: If, Else, Elseif, switch case) 8. Identify the repetition statements: (While statement, For statement). 9. Learn how to use combination of conditional and repetition statements. 10. Understand the procedures and functions (a custom-made MATLAB function, define the name of the function, the input and the output variables, Calling Functions). 11. Learn how to handle graphics and user interface.     1. pre-defined dialogs 2. Handle graphics a) Graphics objects b) Properties of objects c) Modifying properties of graphics objects. 12. Train of GUI Interface (Attaching buttons to actions, Getting Input, Setting |

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|  | Output). |
| **Indicative Contents**  المحتويات الارشادية | 1. Window, Workspace Window, Command History window, Help Window, Editor Window. (2 H) 2. Constants, Entering Matrices, Useful Matrix Generators, Subscripting, End as a subscript, Colon Operator, Transpose Deleting Rows or Columns. (4) 3. variables and assignment statement, logical operator. (4) 4. sum, max, min, mean, magic, diag, length, size, median, prod, sort. (2) 5. Multiple Data Sets in One Graph, Specifying Line Styles and Colors, Multiple Plots in One Figure, Setting Axis Limits. (2) 6. M-file, input-output statement. (2) 7. Conditional statements: If, Else, Elseif, switch case. (2) 8. While statement, For statement. (4) 9. conditional and repetition statements. (4) 10. accustom-made MATLAB function. (4) 11. GUI. (4) 12. GUI attaching buttons to actions, Getting Input, Setting Output. (4) |

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| **Learning and Teaching Strategies**  استراتيجيات التعلم والتعليم | |
| **Strategies** | The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. Moreover, motivate the creative side by posing various problems to students and urging them to find appropriate solutions.  Also forming work teams to assess the results of their work and change their structure periodically to develop the spirit of cooperation and development and motivate students to make intensive efforts to work different roles. |

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| **Student Workload (SWL)**  الحمل الدراسي للطالب | | | |
| **Structured SWL (h/sem)**  الحمل الدراسي المنتظم للطالب خلال الفصل | 46 | **Structured SWL (h/w)**  الحمل الدراسي المنتظم للطالب أسبوعيا | 3 |
| **Unstructured SWL (h/sem)**  الحمل الدراسي غير المنتظم للطالب خلال الفصل | 44 | **Unstructured SWL (h/w)**  الحمل الدراسي غير المنتظم للطالب أسبوعيا | 3 |
| **Total SWL (h/sem)**  الحمل الدراسي الكلي للطالب خلال الفصل | 90 | | |

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| **Module Evaluation**  تقييم المادة الدراسية | | | | | |
|  | | **Time/Nu**  **mber** | **Weight (Marks)** | **Week Due** | **Relevant Learning**  **Outcome** |
| **Formative assessment** | **Quizzes** | 2 | 20% (20) | 5, 10 | LO #1, 2, 3, 4,7,8,9 and  10 |
| **Assignments** | 2 | 20% (20) |  | LO # 9 and 10 |
| **Projects / Lab.** |  |  |  |  |
| **Report** |  |  |  |  |
| **Summative**  **assessment** | **Midterm Exam** | 2hr | 10% (10) | 7 | LO # 1-7 |
| **Final Exam** | 4hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) |  |  |

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| **Delivery Plan (Weekly Syllabus)**  المنهاج الاسبوعي النظري | |
|  | **Material Covered** |
| **Week 1** | Introduction, MATLAB Environment, MATLAB Windows(Command Window, Workspace  Window, Command History window, Help Window, Editor Window). |
| **Week 2** | A First Program, Expressions, Constants, Entering Matrices, Useful Matrix Generators,  Subscripting, End as a subscript, Colon Operator, Transpose Deleting Rows or Columns. |
| **Week 3** | Variables and assignment statement, logical operator. |
| **Week 4** | Arrays, Built in functions, Basic Matrix Functions (sum, max, min, mean, magic, diag, length,  size, median, prod, sort). |
| **Week 5** | Basic Plotting (Multiple Data Sets in One Graph, Specifying Line Styles and Colors, Multiple |

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|  | Plots in One Figure, Setting Axis Limits). |
| **Week 6** | Arguments and return values, M-file, input-output statement |
| **Week 7** | Mid-Exam + Control Statements (Conditional statements: If, Else, Elseif, switch case) |
| **Week 8** | Repetition statements: (While statement, For statement) |
| **Week 9** | Combination of conditional and repetition statements I |
| **Week 10** | Combination of conditional and repetition statements II |
| **Week 11** | Procedures and Functions (a custom-made MATLAB function, define the name of the  function, the input and the output variables, Calling Functions) |
| **Week 12** | Handle graphics and user interface. 1.pre-defined dialogs 2. Handle graphics a) Graphics  objects b) Properties of objects c) Modifying properties of graphics objects |
| **Week 13** | GUI Interface (Attaching buttons to actions, Getting Input, Setting Output) I |
| **Week 14** | GUI Interface (Attaching buttons to actions, Getting Input, Setting Output) II |
| **Week 15** | GUI Interface (Attaching buttons to actions, Getting Input, Setting Output) II |
| **Week 16** | **Preparing for final exm** |

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| **Delivery Plan (Weekly Lab. Syllabus)**  المنهاج الاسبوعي للمختبر | |
|  | **Material Covered** |
| **Week 1** | Introduction, MATLAB Environment, MATLAB Windows (Command Window, Workspace  Window, Command History window, Help Window, Editor Window). |
| **Week 2** | A First Program, Expressions, Constants, Entering Matrices, Useful Matrix Generators,  Subscripting, End as a subscript, Colon Operator, Transpose Deleting Rows or Columns. |
| **Week 3** | Variables and assignment statement, logical operator. |
| **Week 4** | Arrays, Built in functions, Basic Matrix Functions (sum, max, min, mean, magic, diag, length,  size, median, prod, sort). |
| **Week 5** | Basic Plotting (Multiple Data Sets in One Graph, Specifying Line Styles and Colors, Multiple  Plots in One Figure, Setting Axis Limits). |
| **Week 6** | Arguments and return values, M-file, input-output statement |
| **Week 7** | Control Statements (Conditional statements: If, Else, Elseif, switch case) |
| **Week 8** | Repetition statements: (While statement, For statement) |

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| **Week 9** | Combination of conditional and repetition statements I |
| **Week 10** | Combination of conditional and repetition statements II |
| **Week 11** | Procedures and Functions(a custom-made Matlab function, define the name of the  function, the input and the output variables, Calling Functions) |
| **Week 12** | Handle graphics and user interface. 1.Pre-defined dialogs 2. Handle graphics a) Graphics  objects b) Properties of objects c) Modifying properties of graphics objects |
| **Week 13** | GUI Interface ( Attaching buttons to actions, Getting Input, Setting Output) I |
| **Week 14** | GUI Interface ( Attaching buttons to actions, Getting Input, Setting Output) II |

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| **Learning and Teaching Resources**  مصادر التعلم والتدريس | | |
|  | **Text** | **Available in the**  **Library?** |
| **Required Texts** | Introduction to MATLAB for Engineers William J. Palm III | yes |
| **Recommended Texts** | INTRODUCTION TO MATLAB FOR ENGINEERING STUDENTS  ,David Houcque |  |
| **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. | | | | |