| | Ministry of Higher Education and<br>Scientific Research - Iraq<br>University of Technology<br>Computer Science Department<br>Software Branch | |
|---|---|---|

# MODULE DESCRIPTOR FORM
# نموذج وصف المادة الدراسية

## Module Information
### معلومات المادة الدراسية

| Module Title | mathematics | Module Delivery | |
|---|---|---|---|
| Module Type | CORE | **Theory**<br>**Lecture**<br>**Lab**<br>**Tutorial**<br>**Practical**<br>**Seminar** | |
| Module Code | MATH112 | | |
| ECTS Credits | 6 | | |
| SWL (hr/sem) | 150 | | |
| Module Level | 1 | Semester of Delivery | 1 |
| Administering Department | Type Dept. Code | College | Type College Code |
| Module Leader | Lec.Sora Ali | e-mail | 110040@uoTechnology.edu.iq |
| Module Leader's Acad. Title | Lecture | Module Leader's Qualification | M.Sc |
| Module Tutor | None | e-mail | None |
| Peer Reviewer Name | | e-mail | |
| Review Committee Approval | | Version Number | |

## Relation With Other Modules
### العلاقة مع المواد الدراسية الأخرى

| Prerequisite module | None | Semester | |
|---|---|---|---|
| Co-requisites module | None | Semester | |

| Module Aims, Learning Outcomes and Indicative Contents |
|---|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |

| **Module Aims**<br>أهداف المادة الدراسية | 1. To learn how solve and develop problem solving skills |
|---|---|
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | 1. Learning how solve equations by hand without computer.<br>2. Develop the brain ability. |
| **Indicative Contents**<br>المحتويات الإرشادية | Indicative content includes the following.<br><br>➢ Mathematical background<br>➢ Matrix<br>    • Types of matrix<br>    • Matrix addition, subtraction, and multiplication<br>    • Determinant, transpose, symmetric of matrix and rank of matrix<br>    • Inverse of matrix, absolute value, and polynomials<br>    • Grammar rule for solving system of equation.<br>➢ Functions<br>    • Function Definition<br>    • Domain and range of functions<br>    • Graphing of function<br>➢ Limits<br>    • Definition of limits<br>    • Theorems of limits<br>    • Type of limits<br>    • One side and two sides limits<br>    • Limits as infinity<br>    • Sandwich theorem and continues functions<br>➢ Derivation<br>    • Mathematical definition of derivation, rule of derivation<br>    • Derivation of trigonometric, inverse trigonometric, logarithm, exponential hyperbolic, inverse of hyperbolic function.<br>    • Implicit derivation, chain rule, higher derivation<br>➢ Derivation<br>    • L'hopital rule<br>    • Application of derivation, velocity and acceleration<br>➢ Series<br>➢ Integration |

- Indefinite integral
- Rules of integral
- Method of integration
- Multiple integral
- Definite integral
- Application of integral area under the curve
- Area between two curves

## Learning and Teaching Strategies
### استراتيجيات التعلم والتعليم

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

## Student Workload (SWL)
### الحمل الدراسي للطالب

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 86 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 6 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 64 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.5 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 150 | | |

## Module Evaluation
### تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 1 | 5% (5) | 5, 10 | LO #1 and 2 |
| | **Assignments** | 1 | 3% (3) | 2, 12 | LO #1 and 2 |
| | **Projects / Lab.** | | | | |
| | **Report** | 1 | 2%(2) | 13 | LO #1 and 2 |
| **Summative assessment** | **Midterm Exam** | 2 hr | 20% (20) | 7 | LO #1 and 2 |
| | **Final Exam** | 3hr | 70% (70) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

| | **Delivery Plan (Weekly Syllabus)**<br>المنهاج الاسبوعي النظري |
|---|---|
| | **Material Covered** |
| **Week 1** | ➢ Mathematical background<br>➢ Matrix<br>  Types of matrix, Matrix addition, subtraction, and multiplication, Determinant, transpose, symmetric of matrix and rank of matrix |
| **Week 2** | Inverse of matrix, absolute value, and polynomials, Grammar rule for solving system of equation. |
| **Week 3** | ➢ Functions ,<br>Function Definition, Domain and range of functions |
| **Week 4** | Graphing of function |
| **Week 5** | ➢ Limits<br>  Definition of limits, Theorems of limits, Type of limits, One side and two sides limits. |
| **Week 6** | Limits as infinity<br>Sandwich theorem and continues functions |
| **Week 7** | ➢ Derivation<br>  Mathematical definition of derivation, rule of derivation<br>  Derivation of trigonometric, inverse trigonometric, logarithm, exponential. |
| **Week 8** | Derivation of hyperbolic, inverse of hyperbolic function |
| **Week 9** | Implicit derivation, chain rule, higher derivation |
| **Week 10** | L'hopital rule, Application of derivation, velocity and acceleration. |
| **Week 11** | ➢ Series |
| **Week 12** | ➢ Integration<br>Indefinite integral, Rules of integral. |
| **Week 13** | Method of integration |
| **Week 14** | Multiple integral, Definite integral, Application of integral area under the curve, Area between two curves. |
| **Week 15** | **Preparatory Week** |
| **Week 16** | **Final Exam** |

| Delivery Plan (Weekly Lab. Syllabus) |
| المنهاج الاسبوعي للمختبر(ليس مرتبط بمختبر) |

| Learning and Teaching Resources |
| مصادر التعلم والتدريس |

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | **Thomas,G. Calculus and Analytic Geometry,Fifth Edition,Addition Wesly,1999** | Yes |
| **Recommended Texts** | | |
| **Websites** | https://youtube.com/@soraali5120 | |

**APPENDIX:**

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