



Ministry of Higher Education and  
Scientific Research - Iraq  
Al-Mustaqbal University  
College for engineering and technology  
Department of Biomedical Engineering



## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

| Module Information                 |   |                                      |  |
|------------------------------------|---|--------------------------------------|--|
| معلومات المادة الدراسية            |   |                                      |  |
| <b>Module Title</b>                | <b>Applied Mathematics</b>                    |                                      | <b>Module Delivery</b>   |
| <b>Module Type</b>                 | <b>C</b>                                      |                                      | <input type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| <b>Module Code</b>                 | <b>UOMU0102062</b>                            |                                      |  |
| <b>ECTS Credits</b>                | <b>3</b>                                      |                                      |  |
| <b>SWL (hr/sem)</b>                | <b>75</b>                                     |                                      |  |
| <b>Module Level</b>                | <b>٢</b>                                      | <b>Semester of Delivery</b>          |  |
| <b>Administering Department</b>    | Chemical engineering and petroleum industries | <b>College</b>                       |  |
| <b>Module Leader</b>               | Asst.lect.Rusul Ahmed                         | <b>e-mail</b>                        | Email:<br>rusul.ahmed.hashim@uomus.edu.iq  |
| <b>Module Leader's Acad. Title</b> | Assistant lecturer                            | <b>Module Leader's Qualification</b> |  |
| <b>Module Tutor</b>                | Asst.lect.Rusul Ahmed                         |                                      |  |
| <b>Peer Reviewer Name</b>          |   | <b>e-mail</b>                        | Email:<br>rusul.ahmed.hashim@uomus.edu.iq  |
| <b>Review Committee Approval</b>   |   | <b>Version Number</b>                |  |

| <b>Relation With Other Modules</b><br>العلاقة مع المواد الدراسية الأخرى   |   |                 |   |
|---|---|-----------------|---|
| <b>Prerequisite module</b>  |   | <b>Semester</b> | 2 |
| <b>Co-requisites module</b>   |   | <b>Semester</b> |   |
| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |   |                 |   |
| <b>Module Aims</b><br>أهداف المادة الدراسية   | <p>The Applied Mathematics in Chemical Engineering course aims to equip students with the mathematical concepts and tools, including teaching methods, necessary for understanding, analyzing, and solving chemical engineering problems in quantitative and precise ways. This course includes theoretical lectures, practical projects, case studies, and practical applications of mathematical concepts to real-world chemical engineering problems. The goal is to provide students with the ability to effectively use mathematical tools in understanding, analyzing, and designing chemical processes.</p>  |                 |   |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية  |   |                 |   |
| <b>Indicative Contents</b><br>المحتويات الإرشادية   |   |                 |   |
| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم  |   |                 |   |
| <b>Strategies</b>   | <ol style="list-style-type: none"> <li>1. The student is prepared to receive a solid scientific subject</li> <li>2. The student learns how to benefit from the basic theoretical topics in chemical engineering And harnessed in material equipment design.</li> <li>3. - The student learns how to apply the scientific materials that have been taken and compiled in this subject</li> <li>4. Learn how different computer applications work as a program Consolidating the scientific material correctly by conducting daily exams</li> <li>5. Activating the student's role in understanding and benefit from this material to the maximum extent</li> </ol> |                 |   |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب                          |    |  |    |
|--|----|--|----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 75 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعياً       | 48 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 27 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعياً |    |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 75 |  |    |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                        |             |                  |            |                           |
|---|------------------------|-------------|------------------|------------|---------------------------|
|   |                        | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | <b>Quizzes</b>         | 3           | 15% (5)          | 4,8,12     | LO2, LO3, LO4 and LO5     |
|   | <b>Assignments</b>     | 3           | 10% (5)          | Continuous | LO1-LO6                   |
|   | <b>Projects / Lab.</b> |             |                  |            |                           |
|   | <b>Report</b>          | 1           | 5% (5)           | 14         | LO1 and 6                 |
| <b>Summative assessment</b>                       | <b>Midterm Exam</b>    | 2hr         | 10% (10)         | 10         | LO2, LO3, LO4 and LO5     |
|   | <b>Final Exam</b>      | 3hr         | 70% (60)         | 16         | All                       |
| <b>Total assessment</b>                           |                        |             | 100% (100 Marks) |            |                           |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |  |
|---|--|
|   | <b>Material Covered</b>                      |
| <b>Week 1</b>   | First order Ordinary Differential Equations  |
| <b>Week 2</b>   | Second order Ordinary Differential Equations |
| <b>Week 3</b>   | Method of direction integration              |
| <b>Week 4</b>   | Fourier Transforms                           |
| <b>Week 5</b>   | Laplace Transforms                           |
| <b>Week 6</b>   | Unit step function                           |
| <b>Week 7</b>   | Inverse of Laplace transform                 |
| <b>Week 8</b>   | Partial Differential equations               |

|                |  |
|----------------|--|
| <b>Week 9</b>  | Formulation of chemical engineering problems |
| <b>Week 10</b> | Mixing Tanks                                 |
| <b>Week 11</b> | Storage Tank                                 |
| <b>Week 12</b> | Heat transfer problems                       |
| <b>Week 13</b> | Mass transfer problems                       |
| <b>Week 14</b> | Chemical reaction vessels                    |
| <b>Week 15</b> |  |

### Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text   | Available in the Library? |
|--------------------------|--|---------------------------|
| <b>Required Texts</b>    | Revie, R. Winston, and Herbert H. Uhli<br>2008. Corrosion and Corrosion Control<br>Hoboken, NJ, USA: John Wiley & Sons, Inc. |                           |
| <b>Recommended Texts</b> | Encyclopedia of Chemical Eng. Krik and Othmer<br>.2Chemical industry, Shreef   |                           |
| <b>Websites</b>          | process plant design , Harker  |                           |

APPENDIX:

| GRADING SCHEME<br>مخطط الدرجات |                  |             |           |                                       |
|--------------------------------|------------------|-------------|-----------|---------------------------------------|
| Group                          | Grade            | التقدير     | Marks (%) | Definition                            |
| Success Group<br>(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<br>(0 – 49)         | FX – Fail        | مقبول بقرار | (45-49)   | More work required but credit awarded |
|                                | F – Fail         | راسب        | (0-44)    | Considerable amount of work required  |
| Note:                          |                  |             |           |                                       |
|                                |                  |             |           |                                       |



ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي