**Eng. Mathematics**

**Course Description Form**

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| 1. Course Name: | | | | | | | | |
| Engineering mathematics | | | | | | | | |
| 1. Course Code: | | | | | | | | |
| CIER 311 | | | | | | | | |
| 1. Semester / Year: | | | | | | | | |
| First semester / Third year | | | | | | | | |
| 1. Description Preparation Date: | | | | | | | | |
| 1/5/2024 | | | | | | | | |
| 1. Available Attendance Forms: | | | | | | | | |
| In class | | | | | | | | |
| 1. Number of Credit Hours (Total) / Number of Units (Total) | | | | | | | | |
| 4 hrs. | | | | | | | | |
| 1. Course administrator's name (mention all, if more than one name) | | | | | | | | |
| Name: Ahmed Mohamed Mutlaq  Email: ahmed.m.mutlak43837@st.tu.edu.iq | | | | | | | | |
| 1. Course Objectives | | | | | | | | |
| **Course Objectives** | | | | 1. 1. Preparing and qualifying specialized engineers to meet the requirements of the labor market in the private and public sectors in civil engineering through diversifying learning and teaching methods and training students to apply the acquired knowledge and skills to solve real problems. 2. 2. Providing distinguished academic programs in the field of civil engineering in its theoretical and practical aspects in a way that is consistent with international standards of academic quality and meets the needs of the labor market. 3. 3. Encouraging and developing scientific research in the fields of civil engineering in general. 4. 4. Preparing a stimulating environment for faculty members to develop their educational and research knowledge and skills. 5. 5. Building and developing partnerships with governmental and private sectors and society in all its various institutions. | | | | |
| 1. Teaching and Learning Strategies | | | | | | | | |
| **Strategy** | | 1. Teaching students to definition Engineering mathematics 2. Encourage students' participation in the exercises, and assignments. 3. expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types exercises and some sampling activities that are interesting to the students. 4. Practice testing (short question answers and exams). | | | | | | |
| 1. Course Structure | | | | | | | | |
| **Week** | **Hours** | | **Required Learning Outcomes** | | **Unit or subject name** | | **Learning method** | **Evaluation method** |
|  | 4 | | Introduction about Engineering mathematics | | Introduction | | 1. Interactive Learning 2. Experimental Learning 3. Collaborative Learning 4. Technology-enhanced 5. Learning   Problem-based Learning | Several Ways (Exams + Assignments) |
|  | 4 | | First order differential equation | | Introduction of First order differential equation | | Several Ways (Exams + Assignments) |
|  | 4 | | 1. Separable 2. Homogenous 3. Exact 4. linear | | Type of First order differential equation | | Several Ways (Exams + Assignments) |
|  | 4 | | Several Ways (Exams + Assignments) |
|  | 4 | | 1. salt solution 2. Flow of water through orifices 3. Newton law of cooling | | Apps and examples of First order differential equation | | Several Ways (Exams + Assignments) |
|  | 4 | | Several Ways (Exams + Assignments) |
|  | 4 | | Second order differential equation | | Introduction | | Several Ways (Exams + Assignments) |
|  | 4 | | 1. Application of vibration | | Apps and examples of First order differential equation | | Several Ways (Exams + Assignments) |
|  | 4 | | System of simultaneous linear ordinary differential equations | | Introduction | | Several Ways (Exams + Assignments) |
|  | 4 | | Salt concentration in tanks | | Apps and examples of System of simultaneous linear ordinary differential equations | | Several Ways (Exams + Assignments) |
|  | 4 | | Several Ways (Exams + Assignments) |
|  | 4 | | Higher order D.E | | Introduction | | Several Ways (Exams + Assignments) |
|  | 4 | | Several Ways (Exams + Assignments) |
|  | 4 | | * Deflection of beams * Buckling of slender columns | | Apps and examples of Higher order D.E | | Several Ways (Exams + Assignments) |
|  | 4 | | Several Ways (Exams + Assignments) |
| 1. Course Evaluation | | | | | | | | |
| 1. Final Exam: 60% 2. Monthly Exams: 15% 3. Reports and Assignments: 10% 4. Attendance and Daily Participation: 10% 5. Oral Evaluation: 5% | | | | | | | | |
| 1. Learning and Teaching Resources | | | | | | | | |
| Advanced Eng. Mathematics, wylie , 1982 | | | | | |  | | |
| Advanced Eng. Mathematics, kreyszing, 1983 | | | | | |  | | |
| Introduction to ordinary D. E., JOHN WILEY, 1980 | | | | | |  | | |
| Mathematica methods in the physicals, boas | | | | | |  | | |