# Templates NO (10)

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| **University** | Helwan |
| **Faculty** | Computers and Information |
| **Department** | Software Engineering |

#### **Course Specifications**

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| **1- Course Data** | | |
| **Code:** Ma111 | **Course Name:** Mathematics 1 | **Level: One** |
| **Specialization:**  Software Engineering | **No of Learning Units:**  Lecture (3) Practical (2) Tutorial (0)  **Prerequisites**: |  |

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| **2- Course Objective:** | 1. Discuss how to find the limits, continuous and differentiation for functions of one variable.   2- Teach how to use the differentiation to expand any function and draw it by the upper and lower limits, also how to apply the mean value theorem.  3- Recognize the methods of the integrate functions.  4-Discuss the integration to find the area and the volume. |
| **3- Intended Learning Outcomes (ILOs)** | |
| 1. **Knowledge and Understanding:** | **A1-**Define basic concepts of topic, sets, relations and functions.  **A2-**Describe how to differentiate functions.  **A3-**Mention recursive definitions of functions on numbers (e.g. addition and multiplication).  **A4-**Describe how to integrate functions.  **A5-**Define the definite integral and coordinate systems to solve physical problems.  **A6-**Determine an approximate value for a definite integral. |
| 1. **Intellectual Skills:** | **B1-**Analyze the relationships of mathematics.  **B2-**Recognize and discuss solutions to practical problems in science and engineering. |
| 1. **Professional and Practical Skills:** | **C1-**Explain different problems in other fields.  **C2-**Execute mathematics to solve problems in other fields.  **C3-** Produce the cooperative multi-disciplinary teams. |
| 1. **General and Transferable Skills:** | **D1-**Practice Learning and working both independently and in groups. **D2-** Follow Logical Thinking in real time problem solving.  **D3-** Follow Critical and Analytical Thinking. |
| **4- Course Content:** | **Week 1 :**Solving Inequalities  **Week 2:** Definition of Function, Domain and Range of Function, Classification of Functions  **Week 3:** Graph of Functions, Composition of Functions,  Even and Odd Functions  **Week 4 :** Limit of Function: Rules for Finding Limits, Special Limits, Squeeze Rule  **Week 5:** Continuity of Functions, Intermediate Value Theorem  **Week 6:** Differentiation: Rules for Differentiation, Differentiation of Trigonometric Functions  **Week 7: Quiz, Midterm**  **Week 8:** Differentiation of Inverse Trigonometric Functions  **Week 9:** Derivatives of Higher Order, Extreme Values  **Week 10:** Indefinite Integrals: Basic Rules of Integration, Integration by Substitution  **Week 11:** Trigonometric Substitutions, Integration by Parts  **Week 12:** Integration of Rational Functions: The method of undetermined coefficients, The method of determining coefficients  **Week 13 :** Definite Integral: The area of plane figures  **Week 14 :** Volume of Solids  **Week 15: Final Exam.** |
| **5- Learning and Teaching Methods:** | Lectures |
| **6- Learning and Teaching Methods for students with limited skills:** | Academic advising |
| **7- Students Evaluation:** | |
| 1. **Used Methods** | - Semester work  - Final written Exam |
| 1. **Schedule** | * Assessment 1: Throughout the semester * Assessment 2: End of Semester (according to faculty’s exams schedule) |
| 1. **Grades Distribution** | * Final written exam: 60 marks * Semester Work: 40 marks (20 for midterm exam+ 20 for Assignments) * **Total**:100 marks |
| **List of Books and References:** | |
| 1. **Notes:** | * **course notes** |
| 1. **Mandatory Books:** | 1. Salas and Hille‘s, Calculus: One and Several Variables, 7th Edition, 1995, John Wiley & Sons, New York. 2. Arthur B. Simon, Calculus with Analytic Geometry, 1987, Scott, Foresman and Company, Illinois, USA |
| 1. **Suggested Books:** | Howard Anton, Calculus: A New Horizon, 6th Edition, 1999, John Wiley & Sons, New York. |
| 1. **Periodicals & Websites** |  |

**Course Professor:** Dr. Eman Fathy

**Course Coordinator:**

**Chairman of the Scientific Department:**