

وصف المقرر الدراسي

1.	Course Name: Engineering Mathematics
2.	Course Code: ENG102
3.	Semester / Year: Second Semester/2026
4.	Date of Description Preparation: 2026/1/2
5.	Available Attendance Modes: Bologna System
6.	Total Study Hours / Total Credit Units: SSWL 62 + USSWL 63; ECTS 5
7.	Course Responsible: Lecturer Nida Ali Shabbat Al-Zughebi
8.	Course Objectives
Objectives	The Mathematics unit aims to provide students with an understanding of mathematical concepts, skills, and techniques applicable to real-world problems. This course introduces concepts of calculus, complex numbers, vectors, and linear algebra. Additionally, the unit aims to prepare students for future academic and professional endeavors that require mathematical proficiency.
9.	Teaching and Learning Strategy
Strategy	The main strategy in delivering this unit is to encourage student participation in exercises while developing and broadening their critical thinking skills. This will be achieved through lectures, interactive lessons, and by considering types of simple

experiments that include sampling activities which engage students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Topic	Teaching Method	Assessment Method
Week 1 Week 2 Week 3	5		Transcendental Functions: Inverse functions and their derivatives, natural logarithms, functions, hyperbolic functions and their inverses. Matrices and Applications – Part 1	In-person	In-class exams, assignments, Questions
Week 4 Week 5 Week 6	5		Integration Techniques: Integration by parts, trigonometric integrals, trigonometric substitutions, partial fractions, improper integrals.	In-person	In-class exams, assignments, Questions

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Week 7 Week 8 Week 9	5		Polar Coordinates: Polar coordinate system, graphing polar equations, areas and lengths in polar coordinates.	In-person	In-class exams, assignments Questions
Week 10 Week 11 Week 12	5		Matrices and Determinants: Definitions, properties and operations, determinant, matrix inverse, solving systems of linear equations, eigenvalues and eigenvectors.	In-person In-person	In-class exams, assignments Questions In-class exams, assignments Questions
Week 13 Week 14 Week 15	5		Vector Theory: Three-dimensional coordinate systems, vectors in space, unit vectors, dot product, cross product, lines and planes in space, vector-valued functions.		
Week 16	5		Complex Numbers: Complex numbers and operations, solving quadratic equations.	In-person	In-class exams, assignments Questions

			Preparatory week before the final exam.		
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11. Course Assessment

Midterm Exam = 10 %

Short Exams = 10 %

Assessment = 10%

Home + In-class Assignments = 10 %

Reports = 10%

Final Exam = 50 %

12. Learning and Teaching Resources

Required Textbooks (Curriculum, if available)	George B. Thomas Jr., "CALCULUS", 14th Ed
Main References (Sources)	-
Recommended Supporting Books and References (Current Journals, Reports...)	1. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Ed. 2. Schaum's Outline of College Mathematics, Fourth Edition. 3. Mary Attenborough, "Mathematics for Electrical Engineering and Computing", 1st Ed.
Electronic References, Websites	Topics in a Calculus -Wolfram Mathworld.





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