MUTAH UNIVERSITY
Faculty of Engineering
Department of Electrical Engineering

Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0401200	Engineering Analysis	3	11:00 -12:30 Monday, Wednesday

INSTRUCTOR/COORDINATOR

Name	Dr. Aser M. Matarneh
Email/Office	Aser.matarneh@mutah.edu.jo
Office Hours	12:00 -2:00 Sunday, Tuesday
Classroom/Time	11:00 -12:30 Monday, Wednesday

TEXTBOOK

Title	Elements of Electromagnetics
Author/Year/Edition	Matthew N. O. Sadiku.
Other Supplemental Materials	
Title	Advanced Engineering Mathematics
Author/Year/Edition	Erwin Kreyszig, Wiley (Chapters: 7-12)

SPECIFIC COURSE INFORMATION

A. Brief Description of the Content of the Course (Catalog Description)

This course covers:
- Complex Numbers: definition, algebraic operation, properties. Involves the investigation and understanding of the imaginary numbers to appreciate mathematics in the real world and is used in physics, engineering, and statistics.
- Representations of coordinate systems and conversion between them, space curves and surfaces, vector integral and analysis and some applications.
- Vector calculus such as gradient, divergence and curl including second order differential operator will be taught.
- Some useful theorems such as stoke, and divergence theorems will be covered.

B. Pre-requisites (P) or Co-requisites (C)

Ordinary Differential Equations (1) (0301203) **(P)**

C. Course Type (Required or Elective)
Required
SPECIFIC GOALS

A. Course Learning Objectives (CLOs)
CLO1: Understand the complex numbers and their properties [1].
CLO2: Understand the coordinate systems and conversion between them [1].
CLO3: Recognize vector integrals [1].
CLO4: Demonstrate vector calculus [1].
CLO5: Demonstrate Divergence Theorem and Stoke's Theorem and their applications [1].
B. Student Learning Outcomes (SOs) Addressed by the Course

1	2	3	4	5	6	7
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BRIEF LIST OF TOPICS TO BE COVERED		
List of Topics	**No. of Weeks**	**Contact Hours**
Introduction	1	3
• **Complex numbers:** - Arithmetic of complex numbers - Algebraic Operations with Complex Numbers - Conjugate of Complex Number - Euler's formula - Properties - Representations of complex numbers - Polar Form of a Complex Number	3	9
• **Coordinate systems and conversions between them** - Cartesian - Cylindrical - Spherical - Conversion between coordinate systems	3	9
• **Vector Integrals** - Line, surface, and triple integrals involves vectors	2	6
• **Vector Calculus** - First order differential operator. - Gradient, Divergence, and Curl - Second order operator	2	6
• **Divergence Theorem** • **Stoke's Theorem**	2	6

• Revision	1	3
Final Exam	-	-

	Total	*14*	*42*

EVALUATION

Assessment Tool	Due Date	Weight (%)
Mid Exam	According to the university calendar	30
Course Work (Homeworks, Quizzes,Projects, …etc.)	One week after being assigned	20

ABET's Students Learning Outcomes (Criterion # 3)

calendar

		Relationship to program outcomes
ABET 1-7		**… Engineering Student Outcomes**
1.	√	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2.		an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social,environmental, and economic
3.		ability to communicate effectively with a range of audiences
4.		an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutionsin global, economic, environmental, and societal contexts
5.		an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6.		an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

7.		an ability to acquire and apply new knowledge as needed, using appropriate learning strategies