BA224- Mathematics (4)

Hour: Lecture: 2 Hrs.   Tutorial: 2 Hrs.   Credit: 3.

Coordinator: Alfysal Abdelhameed

Text Book:

- Erwin Kreyszig, *Advanced Engineering Mathematics*, John Wiley, 9th edition, 2006.

Specific course information:

a. This course gives a comprehensive study on the 2D and 3D vectors: algebra, differential and integral calculus, and the physical interpretation of the integral theorems. The course also gives a study on the complex functions, its differentiation and integration, the residue theorems and its application to real integrals.
b. Prerequisite: BA223
c. Designation: Required

Specific goals for the course:

- An ability to apply knowledge of mathematics, science, and engineering.

Course instruction outcomes:

- The students will be familiar with Vector Differential Calculus
- The students will be familiar with Vector Integral calculus
- The students will be familiar with Complex Analytic Functions and Complex Integration

Student outcomes:

A, E

Topics Covered:

Vector Algebra / Dot and cross product and Applications - Partial Differentiation / and Derivatives of vector functions - Gradient / Divergence/ curl/ Laplacian - Line Integrals / line Integrals Independent of the path / Exactness - Conservative vector fields - Double Integrals in Cartesian and polar coordinates / Green's Theorem - Surface Integrals / Stokes' Theorem - Triple Integrals / Divergence (Gauss' Theorem) - Review on Integrals Theorems - Complex numbers and functions / forms of representation - Analytic functions/ Harmonic functions - Line complex integrals / Cauchy's Integrals Theorem - Zeros and poles of Analytic functions/ Residues and their evaluation - Residue Theorem / Application to Real Integral - Introduction to Fourier Integrals and Transforms.

Course / credit hours	Math & Basic Sciences	Engineering Topics	General Education
Math 4 (BA224)/3	3		