

BA123- Mathematics (1)

Hour: Lecture: 2 Hrs.

Tutorial: 2 Hrs.

Credit: 3.

Coordinator: Ahmed Elbakly

Text Book:

- Robert T. Smith and Roland B. Minton, *Calculus: Early Transcendental Functions*, Mc GRAW. Hill, latest edition.
- Printed Notes.

Specific course information:

- a. The aim of this course is the differentiation and some of its applications, basic differentiable functions of one variable. It includes definitions and intuitive meanings of derivatives; Higher derivatives; Basic techniques of differentiation; Chain Rule; Parametric equations; Partial differentiation; Implicit differentiation; Inverse function theorem; Logarithmic differentiation; differentiation; Logarithmic functions; Exponential functions; Trigonometric functions; Inverse trigonometric functions; Hyperbolic functions; Differentiation of those; Physical and geometric applications of differentiation; Limits; N^{th} derivative; L'Hôpital rule; Maclaurin's expansion as approximations of functions; Analytic geometry; Translation of Axes; Conic sections.
- b. Prerequisite: none
- 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 basic transcendental functions and their properties.
- The students will develop skills in the techniques of differentiation, and enables them to grasp its intuitive meaning.
- The students will be provided with essential knowledge and skills in analytic geometry.

Student outcomes:

A, E

Topics Covered:

Basic techniques and rules of differentiation - Trigonometric function: properties, basic identities and their derivatives - Inverse of trigonometric and their derivatives - Logarithmic functions: their properties, basic identities and derivatives - Exponential functions: their properties, basic identities and derivatives - Derivative of hyperbolic functions and their inverse - Parametric differentiation and implicit differentiation - The N^{th} derivative - L' Hopital rule - Partial differentiation - Maclaurin's expansion. - Physical application - Curve sketching - Conic sections - General revision.

Course / credit hours	Math & Basic Sciences	Engineering Topics	General Education
Math 1(BA123)/3	3		