East West University

Course Outline

Department of Mathematical and Physical Sciences

Semester: Fall 2022

Course Title : **Differential and Integral Calculus**
Course Code : MAT101
Pre-Requisite : None
Credit Hour : 3
Course Instructor : Dr. Mostak Ahmed, Dept. of MPS.
Office Room : Room No# 454, 3rd Floor.
E-mail Address : mostak.ahmed@ewubd.edu

Class Hours:

Section	Days	Time	Room No.
7	S	1:30PM – 3:00PM	FUB-604
	R		FUB-604

Office Hours:

Sunday	Thursday
11:40-1:30	11:40-1:30

Course Goal: This course is designed to develop the basic concept of students in the area of calculus. A student has to study this course because the contents of the course are very much applicable in all branches of Science and Engineering. Our goal is to obtain basic knowledge about differential calculus and integral calculus.

Course Learning Outcomes: By the end of this course, students should be able to:
(a) determine the rate of change of a quantity (b) find the quantity where the rate of change is given (c) find the equation of the tangent to a curve at a point (d) determine the maxima and minima of a function (e) the equations of Asymptotes and curvature of curves (f) find the area under a plane curve and area of a region enclosed by two or more curves (g) evaluate the volume of a solid using double and triple integration (h) find the volume and surface area of solids of revolution.

Course Contents: 1. Differential Calculus and
2. Integral Calculus.

Description: The following topics will be covered throughout the semester.

Differential Calculus: Functions; Basic concept of limits and continuity; Slopes and Rates of change; Techniques of differentiation, Successive differentiation, Leibnitz theorem, Indeterminate forms, Analysis of Function: Function increasing, Function decreasing, Concavity of a curve, Points of inflection, Rolle's Theorem, Mean-Value Theorem, Taylor's

Theorem; Applications of Derivative; Maxima and minima of a function; Functions of two or more variables; Partial Derivatives, Euler's theorem on homogeneous function.

Integral Calculus: Integration by the method of substitution, by parts. Integration of rational functions by partial fractions, Definite integrals and its properties and use in summing series. Beta function and Gamma function. Applications of definite integrals: Area under a plane curve and area of a region enclosed by two or more curves in Cartesian co-ordinate system, volumes of solids generated by revolution, volumes of hollow solids of revolution by shell method, multiple integrals with application; Jacobeans.

Text Book: Calculus: Howard Anton, Irl Bivens & Stephen Davis, 10th Edition, John Wiley & Sons.

Reference Books: (a) Differential Calculus: Das & Mukherjee.
(b) Integral Calculus: Das & Mukherjee.
(c) Calculus and analytical Geometry: G. B. Thomas & R. L. Finney, 9th Edition, Addison-Wesley Pub.1996.

Term Examinations:

Examinations	Section 1
Term I	10 November 2022 (Thursday)
Term II	08 December 2022 (Thursday)
Final	12 January 2023 (Thursday)

Score Distribution:

Term I Examination	: 20%
Term II Examination	: 20%
Final Examination	: 25%
Quiz	: 10%
Assignment	: 10%
Presentation and Viva	: 10%
Performance	: 5%

Grading Policy:

97%	-	100%	:	A+	73%	-	76%	: C+
90%	-	96%	:	A	70%	-	72%	: C
87%	-	89%	:	A-	67%	-	69%	: C-
83%	-	86%	:	B+	63%	-	66%	: D+
80%	-	82%	:	B	60%	-	62%	: D
77%	-	79%	:	B-	0%	-	59%	: F

Special Guidelines:

- ♣ No make-up quizzes will be held.
- ♣ Students are requested to silent their mobile phones during the class hour.
- ♣ There is zero tolerance for cheating at EWU. Students caught with cheat sheets in their possession, whether used or not used, &/or copying from cheat sheets, writings on the palm of a hand, back of calculators, chairs, or nearby walls, etc. would be treated as cheating in the exam hall. The only penalty for cheating is expulsion from EWU.

Dr. Mostak Ahmed
Date: 02/10/22