MT119-Calculus and Analytical Geometry

Program: BS Computer Science
Semester: Fall 2020
Credit Hours: 03
Pre-requisite: None
Instructor: Dr. Ikram Ullah
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Course Description:

This is an introductory course of 'Calculus' required for all engineering students. The pre-requisite is the mathematics taught at intermediate / A level to students in Pakistan. There will be quick review of the Calculus studied by the students in their intermediate (F.Sc. / A level) classes but at a much advanced level, with introduction of many new topics and material. The emphasis will be on the application of 'Differential and Integral Calculus' to problems of physical sciences and engineering.

At the end of the course, the students should be able to tackle the problems in other disciplines that require calculus tools for their solution.

Text Book:

"Calculus: Early Transcendentals " by James Stewart, 8th Edition Brooks / Cole USA.

Reference Book:

"Thomas' Calculus" by George B. Thomas, Jr., Maurice D. Weir, Joel R. Hass. 14th Edition, Pearson, USA.

Assessment Plan:

Quizzes (5)	10%
Homework assignments (5)	10%
Sessional I	15%
Sessional II	15 %
Final exam	50%
Total	**100%**

Course Contents:

Week	Topics to be Covered	Chapter
1-3	Rules of inequalities and Absolute value, Functions and their graphs. Concept of limits, Continuity of functions, Types of discontinuities.	1, 2
4-6	Secant line and Average Rate of Change and tangent line and instantaneous Rate of Change. Slope of tangent line and derivative. Horizontal and vertical tangent. Techniques of differentiation. Implicit differentiation and chain rule.	2, 3
7-9	Related rates, Roll's theorem, The Mean Value Theorem, Extreme values of functions. Horizontal and Vertical asymptotes, Linearization of functions, Applications of derivatives. L'Hôpital's Rule.	4
10-12	Riemann sums and definite integral, Fundamental theorem of calculus, Techniques of integration.	5
13-16	Applications of integration, Improper integrals.	6

The End