

Institute of Computer Science/Information Technology (ICS&IT)
Faculty of Management Sciences & CS/IT (FMCS)
The University of Agricultural Peshawar

Program:	BS (CS)-I
Course Name:	Calculus & Analytical Geometry
Course Code:	MT-301
Course Hours:	03
Total Weeks:	16
Total Hours:	48

Course Objectives

Calculus is a vast subject. It has many applications in Engineering Sciences as well as in computer Sciences. It enables the students to define slopes of curves, to calculate velocity and acceleration of moving bodies. That's why, the above course is planned for BS(CS) students. The course contents are such that, after the completion of this course, students will be able to differentiate and integrate algebraic as well as trigonometric functions, at the end of the course student will be able to apply the concepts while solving problems of computers.

Course Content:

Limits and Continuity; Introduction to functions, Introduction to limits, Techniques of finding limits, Indeterminate forms of limits, Continuous and discontinuous functions and their applications, Differential calculus; Concept and idea of differentiation, Geometrical and Physical meaning of derivatives, Rules of differentiation, Techniques of differentiation, Rates of change, Tangents and Normals lines, Chain rule, implicit differentiation, linear approximation, Applications of differentiation; Extreme value functions, Mean value theorems, Maxima and Minima of a function for single-variable, Concavity, Integral calculus; Concept and idea of Integration, Indefinite Integrals, Techniques of integration, Riemann sums and Definite Integrals, Applications of definite integrals, Improper integral, Applications of Integration; Area under the curve, Analytical Geometry; Straight lines in R^3 , Equations for planes. Teaching M

Week-1

-Introduction to the Functions

Week-2

-Functions and Graphs

Week-3

-Techniques of finding limits, Indeterminate forms of limits

Week-4

-Limits of Different Functions,
-Left Hand Limits and Right Hand Limits

Week-5

-Continuity of Different Functions

Week-6

-Differentiation, Rules of Differentiation

-Derivatives of Algebraic Functions

Week-7

-Derivatives of Trigonometric and Inverse Trigonometric Functions

Week-8

-Chain Rule

-Applications of Chain Rule, equation

Week-9

- Mean value theorems, Maxima and Minima of a function for single-variable

Week-10

-Maxima, Minima and Point of Inflection

Week-11

-Taylor Series

-Maclaurin Series

Week-12

-Integration of Simple Functions

-Rules of Integrations

Week-13

-Integration by Substitution

- Integration by Parts

Week-14

-Integration by Partial Fractions

--Definite Integrals

-Properties of Definite Integrals

Week-15

-Applications of Definite Integrals

-Riemann sums and Definite Integrals, Applications of definite integrals, Improper integral

Week-16

Straight lines in R^3 , Equations for planes.

Total Marks: 100

Recommended Book:

1. Calculus and Analytic Geometry by Kenneth W. Thomas.
2. Calculus by Stewart, James.
3. Calculus by Earl William Swokowski; Michael Olinick; Dennis Pence; Jeffery A. Cole.