Pre-Mathematics-II

Code	Credit Hours
MATH-163	3-0

Course Description:

This course provides basic knowledge of calculus in the real domain. It equips students with basic tools and techniques that help them in studying advanced concepts of calculus and use them in solving real life problems. The topics related analytical geometry starting from equation of line to conic sections is included in this course.

Text Book:

- Mathematics-II Calculus and Analytical Geometry, (1st Edition), Punjab Textbook Board, Lahore.

Reference Book:

- Thomas' Calculus,(14^{th} Edition) George B. Thomas, Pearson.

Prerequisites:

NA

ASSESSMENT SYSTEM

Quizzes	10%
Assignments	10%
Mid Terms	30%
ESE	50%

Teaching Plan:

Week No	Topics	Learning Outcomes
1	Functions and its Types	Revision of basic concept of functions, its domain and range, graphs of functions. Types of functions. Composition and inverse of functions.
2-3	Limit and Continuity	Introduction to limits. Theorems on limits. Evaluation of limits, Continuous and discontinuous functions.
4-6	Derivatives	Average rate of change, Introduction to differentiation, finding derivative from definition. Theorems on differentiation without proofs. Chain rule. Differentiation of functions other than algebraic. Successive differentiation.
7-8	Integration	Introduction to integration. Integration by substitution method. Integration by Parts.
9	**Mid Semester Exam**	
10-11	Coordinate System and Lines	Coordinate system, distance formula. Translation and rotation of axes. Equations of straight lines. Angle between two lines.
12-15	Conic Section	Introduction to conics. Definition of circle, finding equation of circle, tangent and normal to circle, general form of equation of circle. Parabola and its elements, standard forms of equations of parabolas, graphs of parabolas. Finding equations of parabolas, Ellipse and its elements, standard forms of equations of an ellipse. graphs of ellipse, finding equation of an ellipse, Hyperbolas and its elements, standard forms of equations of hyperbolas. Graphs of hyperbolas, finding equations of hyperbolas.
16-17	Vectors	Introduction of vectors in plane and in space. Scalar product of two vectors. Vector product of two vector.
18	**End Semester Exam**	