PG Department of Mathematics
Name of Programme: B.Sc (Non-Medical, Computer Science, Economics)

Programme Outcomes

PO 1 Critical Thinking: The programme aims to give knowledge with facts and figures related to various subjects in pure sciences such as Physics, Chemistry, Botany, Zoology, Mathematics, Computer Science, Economics, Quantitative Techniques, Bio-informatics, Bio-technology etc.

PO 2 Lifelong learning: Enable the students to understand the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevance in the day-to-day life.

PO 3 Logical experimentation: The learners acquire the abilities in handling scientific instruments, scheduling and executing the experiments in laboratories and to draw logical inferences from the scientific experiments.

PO 4 Creative thinking: They become capable of thinking creatively, to propose innovative ideas in clarifying facts and figures and providing new solution to the problems.

PO 5 Interdisciplinary approach : To give them knowledge about developments in any science subject and how interdisciplinary approach helps in providing better solutions and new ideas for the sustainable developments.

PO 6 Scientific aptitude :The programme targets to develop scientific aptitude among the students to make them open- minded, critical and curious in order to deal with all aspects related to life.

PO 7 Self reliant: To make them capable of applying their acquired knowledge and able to work on their own hence make themselves self-reliant and self-sufficient.

Mapping of Course Outcomes

Semester-I

Paper: I Algebra

CO Number	Course outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO 1	Algebra forms the basis for Higher Mathematics and helps students to apply Mathematical results to more generalized concepts.	Apply	PO2	K3	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 2	Students will learn how to deal with quadratic, cubic and bi-quadratic equations.	Understand	PO4	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 3	Students will able to find eigen values and eigen vectors of square matrix.	Evaluate	PO4	K5	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO4	Students will be able to solve linear equations in three or more variables.	Evaluate	PO7	K5	Exam/Assignment/Quiz/ Seminar/Subject related competitions

Semester-I
Paper: II Calculus & Trigonometry

CO Number	Description	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO 1	Learn the basic concepts of various functions like exponential functions, logarithmic functions and trigonometric functions and their applications to problems in real world.	Understand	PO1	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 2	It helps the students to understand the concept of Limits, Continuity, Uniform continuity and derivatives and different properties of these concepts.	Understand	PO2	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 3	Students will learn how to apply De Moivre's theorem to solve various equations and primitive roots of the complex variables.	Apply	PO4	K3	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO4	Students will be able to find sums of different trigonometric series.	Evaluate	PO7	K5	Exam/Assignment/Quiz/ Seminar/Subject related competitions

Semester-II
Paper: I Calculus and Differential Equations

CO Number	Description	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO 1	Calculus will help students to trace graphs of different functions and how to find their asymptotes, multiple points etc.	Apply	PO1	K3	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 2	Students will be able to relate integrals of different functions using reduction formulae.	Understand	PO5	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 3	Students will be able to solve differential equations with constant and variable coefficients.	Evaluate	PO4	K5	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO4	Students will learn to find maxima and minima, critical points and inflexion points of functions and use it to evaluate problems related to various solids.	Understand, Evaluate	PO2	K2, K5	Exam/Assignment/Quiz/ Seminar/Subject related competitions

Semester-II
Paper: II Calculus

CO Number	Description	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO 1	Introduction of the concepts of Limits, Continuity, and partial derivatives of functions of two variables and different properties of these concepts.	Understand	PO2	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 2	Students will learn to expand functions of two variables using Taylor's theorem.	Understand	PO4	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 3	It helps to understand the concept of double triple integrals, how to solve them and their applications to finding area and volumes of curves.	Apply	PO5	K3	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO4	Students will able to learn and apply the change of order of integration to various double integrals.	Apply	PO7	K3	Exam/Assignment/Quiz/ Seminar/Subject related competitions

Semester-III
Paper: I Analysis

CO Number	Description	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO 1	Analysis will introduce the concepts of sequence, series and their convergence and divergence. Also it will introduce the concept of Riemann integrals.	Understand	PO1	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 2	Students will learn to check the convergence and divergence of sequence by using various tests.	Understand	PO2	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 3	Students will be able to check whether the function is Riemann Integrable or not and find their numerical values.	Understand	PO4	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO4	Students will learn to deal with improper integrals, Beta and Gamma functions.	Analyze	PO7	K4	Exam/Assignment/Quiz/ Seminar/Subject related competitions

Semester-III
Paper: II Analytical Geometry

CO Number	Description	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO 1	It will enhance the knowledge of Straight lines, parabolas, ellipse, hyperbola and sphere.	Understand	PO2	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 2	Solve applied mathematics problems involving analytic geometry and conic sections.	Evaluate	PO4	K5	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 3	Students will be able identify different conics from general equation of degree two.	Analyze	PO4	K4	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO4	Students will learn to transform and rotate axis.	Understand	PO6	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions

Semester-IV
Paper: I Statics and Vector Calculus

CO Number	Description	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO 1	Students will be able to know about the different kind of forces acting on a body at rest and their properties	Understand	PO2	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 2	Students will learn about coplanar forces, parallel forces, Moments, Varignon's theorem of moments, Couples, Resultant of two Coplanar Couples, and Equilibrium of two coplanar couples	Understand	PO2	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 3	Students will learn about Centre of Gravity of different bodies.	Understand	PO5	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO4	Student will understand Green's Theorem, Divergence Theorem, Stoke's theorem and evaluate line integrals, surface and volume integrals.	Evaluate	PO4	K5	Exam/Assignment/Quiz/ Seminar/Subject related competitions

Semester-IV
Paper: II Solid Geometry

CO Number	Description	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO 1	In Solid Geometry the students will learn about the surfaces and solids in space like cones, cylinders and prisms.	Understand	PO2	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 2	Students will be able to identify equation of cones and cylinders from a second degree equation in three variables.	Understand	PO4	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 3	Students will learn how to find surfaces of revolution of different curves.	Evaluate	PO6	K5	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO4	Students will identify type of general equation of second degree.	Analyze	PO7	K4	Exam/Assignment/Quiz/ Seminar/Subject related competitions

Semester-V
Paper: I Dynamics

CO Number	Description	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO 1	Dynamics will help to understand the concept of speed, velocity, acceleration and use these in solving problems.	Understand	PO2	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 2	Students will learn about Newton's Laws of Motion and apply it to solve various problems.	Apply	PO4	K3	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 3	Students will able to evaluate problems of work, power and energy and laws related to kinetic and potential energy.	Evaluate	PO5	K5	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO4	Students will able to evaluate curvilinear motion of particle in a plane and projectiles.	Evaluate	PO6	K5	Exam/Assignment/Quiz/ Seminar/Subject related competitions

Semester-V
Paper: II Number Theory

CO Number	Description	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO 1	It will enhance the concepts of divisibility, G.C.D, L.C.M and basic properties of integers.	Understand	PO2	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 2	Students will be able to apply Euclid's Algorithm and backward substitution.	Apply	PO4	K3	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 3	Students will be able to understand the definitions of congruences, residue classes and their properties and able to solve problems by congruences.	Understand, Evaluate	PO4	K2, K5	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO4	Students will learn about different number theoretic functions and their properties.	Apply	PO7	K3	Exam/Assignment/Quiz/ Seminar/Subject related competitions

Semester-VI
Paper: I Linear Algebra

CO Number	Description	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO 1	Linear Algebra will introduce the concept of Groups, Rings and Fields. Vector Spaces and Linear Transformations.	Understand	PO2	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 2	Students will learn about linear span, Linear dependence, Linear independence of vectors and Linear combination of vectors, Basis of a vector space.	Understand	PO4	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 3	Students will be able to solve problems of Linear transformation and Algebra of linear transformation.	Evaluate	PO4	K5	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO4	Also will learn Rank-Nullity theorem and Matrix of a linear transformation.	Understand	PO7	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions

Semester-VI
Paper: II Numerical Analysis

CO Number	Description	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO 1	Students will be able to learn common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.	Apply	PO2	K3	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 2	Students will be able to drive numerical methods for various mathematical operations and tasks such as interpolation the solutions of linear and nonlinear equations.	Understand	PO4	K2	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO 3	Students will be able to analyze and evaluate the accuracy of common numerical Methods.	Analyze	PO4	K4	Exam/Assignment/Quiz/ Seminar/Subject related competitions
CO4	Students will be apply to various method numerical integration and differentiation for finding the values of integrals and derivatives.	Apply	PO7	K3	Exam/Assignment/Quiz/ Seminar/Subject related competitions