Program Specific Outcome (PSO) and Course Outcome (CO) for B.Sc. HONOURS in Mathematics

PSO1**:** Students will get a strong and valuable knowledge of mathematics which will help them to think logically and they can apply them in both their personal and professional life throughout.

PSO2: Students will have the ability to formulate and then solve the critical higher order and complex type problems.

PSO3: Students will create an interdisciplinary relation between the other streams.

PSO4: Students will have a creative and logical mind by which they can analyze & solve practical problems in their life.

PSO5: Students will apply appropriate techniques and also have the ability of modeling complex and challenging problems.

PSO6: The knowledge of Mathematics will make the students ethical and responsible citizen of nation.

PSO7: Students will be able to do work as a whole or team or individually and communicate effectively with others.

PSO8: Students will recognize the need of self learning and life-long learning to demonstrate the knowledge in the development of society and himself.

B.Sc. Honours:

Part-I -1st semester

Course code: MATH11 HCC-1

Course Title: Calculus, Geometry and Differential Equation.

Course Outcomes:

This course offers the students to:

CO1: know about the Hyperbolic functions, higher order derivatives, to know about Leibnitz rule and its applications.

CO2: understand the concavity and inflection points, envelopes, asymptotes, curve tracing in Cartesian coordinates.

CO3: gain a concept about L'Hospital's rule and its applications in different fields like in business, economics and life science.

CO4: know the Reduction formulae, derivations and illustrations of reduction formulae, understand the parametric equations, arc length of a curve, area and volume of revolution and to solve the related problems.

CO5: understand the basic concept of conics, rotation of axes and classification of conics and polar equations of conics.

CO6: know about the properties of Sphere, Cylindrical surfaces, conicoids, paraboloids , generating lines and solve these related problems.

CO7: understand the basic idea of Differential equation and apply the knowledge of Differential equations to solve the real life problems.

CO8: solve the first order Differential equations using different types of method, especially linear differential equations and Bernoulli equations.

Part I- 1st semester

Course Code: MATH11 HCC-II

Course Title: Algebra

Course Outcomes:

This course offers the students to:

CO1: understand the basics of Complex number, proof of De Moiver's theorem and its applications.

CO2: know about Theory of Equations, relationship between roots and coefficients, Descartes rule of signs, to solve the cubic & biquadratic equations.

CO3: have the knowledge in inequality involving $A.M \geq G.M \geq H.M$.

CO4: understand the basic concept of Integers, well ordering property of positive integers, congruence relation and mathematical induction and solving problems using these results.

CO5: know about set theory, equivalence relation, functions and its types.

CO6: have a basic and strong knowledge in Linear algebra.

CO7: solve the linear system problems using matrix representation, applications of linear systems.

CO8: gain knowledge about Vector space, subspaces and dimension of subspaces.

CO9: solve the Eigen value related problems; understand about Eigen vectors, Clayey-Hamilton theorem and using this find the inverse of a matrix.

Part-I 2nd semester

Course Code: MATH21 HCC-III

Course Title: Real Analysis.

Course Outcomes:

This course offers the students to:

CO1**:** understand the algebraic and order properties of R, brief idea about countability of sets, know L.U.B & G.L.B of a set, gain a clear idea of Archimedean property.

CO2: :understand about Point set theory, neighbourhood of a point, concept about limit points and find limit points of sets, know about Bolzano-Weierstrass theorem and know about its importance on limit point.

CO3: gain the concept on closed set, open set and its operations and apply this knowledge in solving some related problems.

CO4: understand about the concept of Sequence and check its convergence, non - convergence, Cauchy sequence, to understand some basic theorems on Subsequences, know about limsup. liminf of a sequence, subsequential limits.

CO5: know about series its definition, convergence and divergence, different types of test such as Comparison test, limit test, Cauchy's nth root test to check the convergence of infinite series of positive real numbers and also have an idea about Absolute and conditional convergence.

Part-I 2nd semester

Course Code: MATH21 HCC-IV

Course Title: Differential Equations and Vector Calculus.

Course Outcomes:

This course offers the students to:

CO1: know about Lipschitz condition and Picard's theorem to check the existence of a solution of a D.E, have idea to solve homogeneous equation of second order, and also linear homogeneous and non-homogeneous equations of higher order with

constant coefficients using the method of undetermined coeffiecients, method of variation of parameters.

CO2: understand the system of linear differential equations, and know differential operator and its applications to solve the linear system with constant coefficients.

CO3: know the Power series solution of D.E. and also understand the ordinary and singular points of an O.D.E.

CO4: gain the idea of equilibrium points and interpretation of phase plane.

CO5: gain idea of vector triple product and its application, understand about limit and continuity of vector functions and using this idea solve some problems, also know the differentiation and integration of vector functions.

B.Sc Hons 2nd year

Paper-V

Course Title: Real Analysis-II, Calculus of Several Variables-II, Applications of Calculus

Course Outcomes:

This course offers the students to:

CO1: To make a clear concept of series of non-negative real numbers, different types of test to check the convergent.

CO2: Able to understand Limit of functions, Sandwitch theorem,Cauchy criterion for the existence of finite limit.

CO3: Be able to understand Continuity of functions, Bolzano's theorem, Intermediate value theorem, Uniform continuity and their properties.

CO4: To make a clear concept of Derivative of functions,Lipschitz's condition and Darboux's theorem.

CO5: Gain a clear concept of maxima and minima of functions, sufficient condition for the existence and their applications.

CO6: To understand theory of Young's theorem, Schwartz's theorem, Jacobian, Implicit function and about functions of several variables.

CO7: To make clear concept about the application of Differential calculus: Plane curve,Tangents and Normals, Curvature, Asymptotes, Envelopes and Singular points.

CO8: To understand the application of Integral calculus: Area enclosed by a curve, Volume and Surface areas, Centre of Gravity, Moment of Inertia, Reduction Formulae.

B.Sc Hons 2nd year

Paper-VI

Course Title: Integral Calculus-II, Dynamics of a Particle.

Course Outcomes:

This course offers the students to:

CO1: To make a clear concept of Riemann Integration ,Darboux's theorem, Necessary and Sufficient condition of Riemann integrability and different classes of Riemann-integrable functions.

CO2: Gain clearer concept of Riemann sum, properties of definite integral, Fundamental theorem of Integral Calculus, statements and applications of First and Second Mean Value theorems of Integral Calculus.

CO3: To understand Motion in a straight line under variable acceleration, Simple Harmonic motion.

CO4: Be able to understand Motion in a plane under central forces, Central orbit, Tangential and normal components of acceleration and Circular motion.

CO5: Make a clear concept of Motion of a particle in a plane under different laws of resistance, Motion of a projectile in a resisting medium, Terminal velocity.

CO6: Gain clear concept of Motion of a particle under the Inverse square law in a plane,Kepler's laws of planetary motion

CO7: Able to understand Equation of motion of a particle of varying mass and problems of varying mass.

B.Sc Hons 2nd year

Paper-VII

Course Title: Modern Algebra-II, Linear Algebra-II, Vector. Analysis.

Course Outcomes:

This course offers the students to:

CO1: Able to understand Cosets,Lagrange's theorem and Cyclic groups.

CO2: Gain clearer concepts of Permutation, Ring, Integral domain, Field and able to solve related problems, theorems.

CO3: To make clear concept of Inner product spaces, Bessel's inequality, Gram-Schmidt orthogonalization method.

CO4: To understand concepts of Linear Transformation on Vector Spaces, corresponding Matrix representation and its properties.

CO5: Gain clear concept of Vector differentiation, Tangent to a curve at a point, Normal plane, Serret-Frenet formulae,Oscilating plane and Rectifying plane.

CO6: Able to understand concept of scalar and vector fields, Directional derivative,Gradient,Divergence and Curl, their properties, Green's theorem in a plane, Stokes' theorem and Divergence theorem.

B.Sc Hons 2nd year

Paper-VIII

Course Title: Geometry (3D), Differential Equations-II.

Course Outcomes:

This course offers the students to:

CO1: Gain clear concept of equation of plane, Straight line, condition of Co planarity of two lines, Skew lines and shortest distance between skew lines.

CO2: To make clear concept of Sphere, Cone, Cylinder, Ellipsoid, Hyperboloid, Paraboloid referred to principal axes and solve different types of problems.

CO3: Able to understand Transformation of rectangular axes by translation, rotation and their combinations, Tangent and Normal,Envelpoing cone and Reciprocal cone.

CO4: Gain clear concept of Second order linear differential equations with variable coefficients, simple Eigen value problem, Simultaneous linear differential equations.

CO5: Understand concept of Partial differential equations and classification, solution by Lagrange's method and Charpit's method,application of Laplace transformation,Power series solution.

B.Sc. Hons 3rd year

Paper-IX

Course Title: LPP,Tensor algebra and Analysis.

Course Outcomes:

The students who complete this course successfully are expected to:

CO1: Gain clear concept of Linear programming problem formulation, basic properties of Convex sets, Hyperplane, Convex hull, linear programming in matrix notation.

CO2: To understand different methods of solution of Linear programming problem such as Graphical method,Simplex method, duality, Transportation and Assignments problems.

CO3: Be able to understand concepts of E^n,Tensor as a generalisation of vector in E^2,E^3 and E^n,Covariant and Contravariant vectors,Invariant,Einstein's Summation convention,Kronecker delta.

CO4: Make clear concept of Covariant,Contravariant and Mixed tensors,Algebra of tensors, Symmetric and skew-symmetric tensors, Reciprocal tensor and Quotient law.

CO5: Gain clear concept of Riemannian space, Metric tensor, Magnitude of a vector, Angle between two vectors.

CO6: Understand concept of Christoffel symbols and their laws of transformations,Ricci tensor,Geodesic coordinates and Bianchi identity.

B.Sc. Hons 3rd year

Paper-X

Course Title: Real Analysis-III, Integral Calculus-III.

Course Outcomes:

This course offers the students to:

CO1: Gain clear concept of Linear point set, Compact sets, Cantor intersection theorem, Heine Borel theorem.

CO2: Be able to understand Limit, Continuity and Uniform continuity on Compact set, Sequence of function,Dinis theorem on Uniform convergence and able to check pointwise and uniform convergence of a given sequence of function.

CO3: Understand series of functions, some tests to check uniform convergence of a series of function.

CO4: Able to understand power series,Cauchy-Hadamard and Abel's limit theorem and their application, finding Radius of convergence.

CO5: Make a clear concept of Mean value theorem and Taylor's theorem,Extremum of functions of two and three variables.

CO6: Gain clear concept of Improper integral, Necessary and Sufficient condition for convergence of improper integral, different types of test of convergence of improper integral, Uniform convergence of improper integral by M-test and convergence of Beta and Gamma functions.

CO7: Understand Differentiation and integration with respect to parameter under integral sign, some relevant theorems and problems.

CO8: Able to solve Fourier series problems.

CO9: Solve problems related to Multiple integral.

B.Sc Hons 3rd year

PAPER –XI

Course Title: Metric space, Complex Analysis, Modern Algebra-III.

Course Outcomes:

This course offers the students to:

CO1: understand the basic concepts of Metric spaces,

CO2: make a clear idea of open sets, closed set, subspace of Metric space.

CO3: understand Cauchy sequence, theory of Cantor Intersection, Real number as a complete ordered field.

CO4: gain concept complex number as an ordered pair, Stereographic projection.

CO5: understand complex functions, continuity and differentiability of complex functions. Analytic functions, harmonic functions.

CO6: know conformal mappings Bilinear transformation.

CO7: gain the basic concept of Normal subgroups, their properties, Quotient group of a group by a normal subgroup.

CO8: understand about Homomorphism, isomorphism. Infinite cyclic group is isomorphic to the group of residue classes of modulo n.

B.Sc Hons 3rd year

PAPER –XII

Course Title: Theory of Probability, Rigid Dynamics.

Course Outcomes:

This course offers the students to:

CO1: know the basic concept of random experiments, simple and compound events, event space, classical and frequency definitions of probability, axioms of probability, Bayes' theorem.

CO2: understand about independent events, Bernoulli trials and binomial law. Poisson trials, probability distribution function, continuous and discrete distribution: Binomial, Poisson, Gamma, Uniform and Normal distributions.

CO3: know about transformation of random variable, Two dimensional probability distributions, Discrete and continuous distributions, conditional distributions.

CO4: understand the concepts of mathematical expectation, mean, variance, moments and central moments, dispersion, skewness and kurtosis, median, mode quartiles, moment generating function, characteristic equation, correlation co-efficient, Regression curves, least square regression lines and parabolas.

CO5: know the idea of Chi-square and t-distributions and their properties, Tchebychef's inequality, statement of Bernoulli's limit theorem, law of large numbers, Poisson's approximation to binomial distribution and normal approximation to binomial distribution, statement of central limit theorem in the case of equal components and of limit theorem for characteristic functions.

CO6: understand about rigid dynamics- momental ellipsoid, equimomental system.

CO7: know about D'Alembert's principle, D'Alembert's equations of motion, principle of conservations of linear and angular momentum, independence of the motion of centre of inertia and the motion relative to the centre of inertia.

CO8: gain an idea about the equation of motion of a rigid body about a fixed axis, expression for kinetic energy and moment of momentum of a rigid body moving about a fixed axis.

CO9: know about compound pendulum, its point of suspension and centre of oscillation, minimum time of oscillation.

B.Sc Hons 3rd year

PAPER – XIII

Course Title: Theory of Statistics, Analytical Statics.

Course Outcomes:

This course offers the students to:

CO1: Know about the basic concept of Random sample, Sampling and its various types, tabulation and graphical representation of data.

CO2: Understand about Sampling distribution, estimates of a parameter, unbiased and consistent estimates, sampling distribution of the sample mean and variance.

CO3: Have an idea about Bivariate samples, sample correlation coefficient, and solve the problems related least square regression lines and parabolas.

CO4: Understand and solve the estimation of parameters, method of maximum likelihood function and its application in binomial , poisson and normal populations.

CO5:Have a clear idea about statistical hypothesis.

CO6:Know the theory of Neyman-Pearson and its application to normal population and also some application of hypothesis testing.

CO7: know about center of gravity, general formula of C.G., determination of C.G. of any arc, area of solid of known shape.

CO8: gain an idea about astatic equilibrium, astatic centre, and positions of equilibrium of a particle lying on a smooth plane curve under the action of given forces.

CO9: know about virtual work, principle of virtual work,principle of virtual work for any system of coplanar forces acting on a rigid body, converse of the principle of virtual work.

CO10:gain an idea about stable and unstable equilibrium, degree of freedom, conservative field, potential energy of a system, the energy test of stability,condition for stability of equilibrium of a heavy body lying on fixed body.

CO11: understand about forces in three dimensions, moment about a line, conditions for equilibrium of a system of forces acting on a body, Poinsot's central axis, and equation of central axis of a given system of forces.

B.Sc. Hons 3rd year

PAPER – XIV

Course Title: Classical Mechanics, Discrete Mathematics and Boolean Algebra.

Course Outcomes:

This course offers the students to:

CO1: gain a basic concept about conservation principles, conservation of linear momentum and energy, degrees of freedom.

CO2: know the Newtonian mechanics, its limitations, generalized potential, energy integrals for conservative fields.

CO3:understand the principle of Discrete mathematics and its applications, partial and linear orderings, lattices.

CO4: have an idea about Boolean Algebra, relation of Algebra with Boolean Algebra, duality, know about Boolean functions and its normal forms.

CO5: have a basic concept of Graph theory, its basic properties, different types of graphs such as connected graph, complete graph, complement of a graph, Bipartite graphs.

CO6: know about Euler graphs, Plannar graphs, basic idea of tree and its properties, Kruskal's algorithm, Binary tree.

B.Sc. Hons 3rd year

PAPER – XV

Course Title: Numerical Analysis, Computer Science and Programming.

Course Outcomes:

This course offers the students to:

CO1:know about the basics of numerical analysis, errors, different types of errors, types of operators.

CO2:understand about interpolation , students are capable to solve the problems related to interpolation, Newton's forward and backward interpolation formulae, Stirling's and Bessel's interpolation formulae, Lagrange's interpolation formula.

CO3:gain the concept of numerical differentiation, numerical integration ,their formulae and their application in solving problems.

CO4:know the method to solve the solutions of non-linear equations and system of linear equations- Guass elimination method, Seidal method their convergence.

CO5: solve the Eigen value problems, ordinary differential equations- Euler method, Runge-Kutta method(2^{nd} order, 4^{th} order).

CO6:understand the basics of computer fundamentals.

CO7:know about different types of number system and their conversion, algorithm and flow charts.

CO8:gain the knowledge about programming language.

CO9: know about the basics of ANSI C, construction of simple C program & apply this knowledge in various fields.

B.Sc Hons 3^{rd} year

PAPER – XVI

Course Title: Numerical methods: Practical (using scientific calculator and using C programming).

Course Outcomes:

This paper offers the students to:

CO1: solve the numerical methods using scientific calculator with the help of their knowledge of numerical analysis. The methods are-Bisection method, Fixed-point method, Newton- Raphson method, Regula-Falsi method, Newton's Divided Difference Interpolation, Stirling &Bessel interpolations, Lagrange interpolation, Newton's forward and backward interpolations, Trapezoidal, Simpson's 1/3 and Weddle's rules, Guass Elimination method, Guass-Seidal method, Euler's method, Runge-Kutta method(4^{th} order).

CO2: apply the knowledge of C programming in solving the numerical methods, such as- Bisection method, Fixed-point iteration, Scant method, Newton-Raphson method, Regula –Falsi method, Simpson's 1/3 rule, Euler's method, Runge-Kutta method(4^{th} order).

Program Specific Outcome (PSO) and Course Outcome (CO) for B.Sc. GENERAL / GE / DSC Course in Mathematics

Generic Elective (GE) Course

Course code: MATPGE1

Course Title: Calculus, Geometry and Differential Equation.

Course Outcomes:

This course offers the students to:

CO1:know about the Hyperbolic functions, higher order derivatives, to know about Leibnitz rule and its applications.

CO2: understand the concavity and inflection points,envelopes, asymptotes, curve tracing in Cartesian coordinates.

CO3: gain a concept about L'Hospital's rule and its applications in the different fields like in business, economics and life sciences.

CO4: know the Reduction formulae,derivations and illustrations of reduction formulae, understand the parametric equations, arc length of a curve, area and volume of revolution and to solve these related problems.

CO5: understand the basic concept of conics, rotation of axes and classification of conics and polar equations of conics.

CO6: know about the properties of Sphere, Cylindrical surfaces, conicoids, paraboloids , generating lines and solve these problems.

CO7: understand the basic idea of Differential equation and apply the knowledge of Differential equations to solve the real life problems.

CO8: solve the first order Differential equations using different types of method, specially linear differential equations and Bernoulli equations.

Course code: MATPGE2

Course Title: Algebra

Course Outcomes:

This course offers the students to:

CO1: understand the basics of Complex number, theory of De Moiver's theorem and its applications.

CO2: know about Theory of Equations, relationship between roots and coefficients, Descartes rule of signs, to solve the cubic & biquadratic equations.

CO3: have the knowledge in inequality involving $A.M \geq G.M \geq H.M$.

CO4: understand the basic concept in Integers, well ordering property of positive integers, congruence relation, and mathematical induction and solving problems using this.

CO5: know about set theory, equivalence relation, functions and its types.

CO6: have a basic and strong knowledge in Linear algebra.

CO7: solve the linear system problems using matrix representation, applications of linear systems.

CO8: gain knowledge about Vector space, subspaces and dimension of subspaces.

CO9: solve the Eigen value related problems, understand about Eigen vectors, Cayley-Hamilton theorem and using this find the inverse of a matrix.

Course code: MATPGE3

Course Title: Differential Equation and Vector Calculus.

Course Outcomes:

This course offers the students to:

CO1: Gain knowledge about Lipschitz condition and Picard's Theorem,2^{nd} order homogeneous equations, properties and applications of Wronskian.

CO2: Make a clear concept of Linear homogeneous and non-homogeneous equations of higher order with constant coefficients, Euler's equation.

CO3: Solve method of undetermined coefficients and method of variation of parameters related problems.

CO4: Gain a clear concept of power series solution of a differential equation about an ordinary point and solution about a regular singular point.

CO5: Know about systems of linear differential equations, types of linear system,operator method for linear systems with constant coefficients.

CO6: Make a clear concept of linear systems in normal form, homogeneous linear systems with constant coefficients

CO7: Understand vector triple product,limit,continuity,differentiation and integration of vector functions.

Course code: MATPGE4

Course Title: Group theory

Course Outcomes:

This course offers the students to:

CO1: Gain a clear concept of Groups including permutation groups and quaternion groups,subgroups,center of group,product of two subgroups.

CO2: Knowledge about cyclic groups ,properties of permutation,alternating group, Cosets,Lagrange's theorem and consequences including Fermat's Little theorem.

CO3: Make a clear concept of external direct product of finite number of groups,normal subgroups,factor groups and Cauchy's theorem.

CO4: Understand group homomorphism,properties of homomorphism.

CO5: Know about Cayley's theorem,properties of isomorphisms and isomorphism theorems.

Course code: MATPGE5

Course Title: Numerical Method

Course Outcomes:

This course offers the students to:

CO1:know about the basics of numerical analysis, errors, different types of errors, types of operators.

CO2:understand about interpolation , students are capable to solve the problems related to interpolation, Newton's forward and backward interpolation formulae, Lagrange's interpolation formula.

CO3:gain the concept of numerical differentiation, numerical integration ,their formulae and their application in solving problems.

CO4:know the method to solve the solutions of non-linear equations and system of linear equations- Guass elimination method, Seidal method their convergence.

CO5: solve the Eigen value problems, ordinary differential equations- Euler method, Runge-Kutta method(2^{nd} order).

B.SC. PROGRAMME COURSE / GENERAL

Mathematics

PSO1**:** Students will get a strong and valuable knowledge of mathematics which will help them to think logically and apply them in both their personal & professional life throughout.

PSO2: Students will have the ability to formulate and then solve the critical and complex type problems.

PSO3: Students will create an interdisciplinary relation between the other streams.

PSO4: Students will have a creative and logical mind by which they can analyze & solve practical problems in their life.

PSO5: The knowledge of Mathematics will make the students ethical and responsible citizen of nation.

PSO6: Students will be able to do work as a whole or team or individually and communicate effectively with others.

PSO7: Students will recognize the need of self learning and life-long learning to demonstrate the knowledge in the development of society and him.

UG PROGRAMME COURSE

Semester-1

Course Code: MATP11DSC

Paper-1

Course Title: Calculus and Geometry

Course Outcomes:

This course offers the students to:

CO1: know about the Hyperbolic functions, higher order derivatives, to know about Leibnitz rule and its applications.

CO2: understand the concavity and inflection points,envelopes, asymptotes, curve tracing in Cartesian coordinates.

CO3: gain a concept about L'Hospital's rule and its applications in the different fields like in business, economics and life sciences.

CO4: know the Reduction formulae,derivations and illustrations of reduction formulae, understand the parametric equations, arc length of a curve, area and volume of revolution and to solve these related problems.

CO5: understand the basic concept of conics, rotation of axes and classification of conics and polar equations of conics.

CO6: know about the properties of Sphere, Cylindrical surfaces, conicoids, paraboloids , generating lines and solve these related problems.

Semester-2

Course Code: MATP24 DSC

Paper-2

Course Title: Algebra.

Course Outcomes:

This course offers the students to:

CO1: understand the basics of Complex number, polar representation of complex number, theory of De Moiver's theorem and its applications.

CO2: know about Theory of Equations, relationship between roots and coefficients, Descartes rule of signs, to solve the cubic & biquadratic equations.

CO3: have the knowledge in inequality involving A.M $\geq$ G.M $\geq$ H.M.

CO4: understand the basic concept in Integers, well ordering property of positive integers, congruence relation, and mathematical induction and solving problems using this.

CO5: know about set theory, equivalence relation, functions and its types.

CO6: have a basic and strong knowledge in Linear algebra.

CO7: solve the linear system problems using matrix representation, applications of linear systems.

CO8: gain knowledge about Vector space, subspaces and dimension of subspaces.

CO9: solve the Eigen value related problems, understand about Eigen vectors, Cayley-Hamilton theorem and using this find the inverse of a matrix.

B.SC GENERAL 2nd Year

Paper-IV

Course Title: Integral Calculus, Ordinary Differential Equations.

Course Outcomes:

This course offers the students to:

CO1: Able to understand evaluation of Definite Integrals,Reduction formulae and associated problems,Integration as the limit of sum.

CO2: Understand definition of Improper Integrals,statements and simple problems of μ-test, comparison test, Beta and Gamma functions.

CO3: Familiar with the working knowledge of Double integral.

CO4: Make a clear concept of Rectification,Quadrature,some problems of volume and surface areas of solids formed by revolution of plane curve and areas.

CO5: Gain a clear concept of Order,degree,solution of Ordinary Differential Equation and its formation.

CO6: Understand First order Differential Equation, variables separable, Homogeneous equations, Exact equations, Euler's and Bernoulli's equations, Clairaut's equation.

CO7: Make a clear concept of Higher order Linear Differential Equations with constant coefficients, Euler's homogeneous equations and Orthogonal trajectories.

B.SC GENERAL 2nd Year

Paper-V

Course Title: Numerical Analysis, Linear Programming and Optimization

Course Outcomes:

This course offers the students to:

CO1: Able to understand Approximation of numbers, Rounding off numbers, various types of errors, definitions and some relations among Operators.

CO2: Make a clear concept of Polynomial Interpolations like Lagrange's Interpolation formula, Newton's divided interpolation formula, Newton's Forward and Backward Interpolation Formula and their applications.

CO3: Able to know deduction of Trapezoidal, Simpson's 1/3 formulae and their geometrical interpretations and some problems.

CO4: Gain a clear concept of finding solution of Numerical Equations by Location of root, Bisection method, Newton-Raphson method with geometrical problems and some problems.

CO5: Make a clear concept of Linear programming problem formulation, various types of solutions, basic properties of convex sets,Hyperplane.

CO6: Finding solution of Linear programming problem by Graphical method, Simplex method and method of Penalty.

CO7: Make a clear concept of Duality, Duality theorem and some dual problems.

B.SC GENERAL 2nd Year

Paper-VI

Course Title: Analytical Dynamics, Probability and Statistics.

Course Outcomes:

This course offers the students to:

CO1: Gain clear concept of Motion in a straight line under variable acceleration, Simple Harmonic motion.

CO2: know the expressions for velocity and acceleration of a particle moving on a plane in Cartesian and Polar coordinates, Central force and central orbit.

CO3: Make a clear concept of Tangential and normal accelerations, Circular motion.

CO4: Understand concept of Motion of a particle in a plane under different laws of resistance, Motion of a projectile in a resisting medium, Trajectories in a resisting medium, Terminal velocity.

CO5: Gain a clear concept of Random variables, Distribution function, Discrete and continuous distribution in two dimensions and their related study.

CO6: Make a clear idea about Mathematical expectation,Mean,Variance,Moments and central moments.

CO7: Understand Measures of skewness and kurtosis, Median, Mode, Quartiles, Covariance, Correlation co-efficient, Regression curves.

CO8: Gain clear concept of Random sample,collection,tabulation and graphical representations.

CO9: make a clear concept of sampling distribution.

B.SC GENERAL: Part- III

Paper-VII(A)

Course Title: Computer Science and Programming, A course of Calculus, Discrete Mathematics.

Course Outcomes:

This course offers the students to:

CO1: know about the basics of Computer Fundamentals such as its historical development, generations, gain knowledge about operating system, number system- binary, decimal, octal & their conversion.

CO2: gain a clear concept about programming languages: Machine language, Assembly language, High level language, their algorithm and their application to write a program.

CO3: able to gain the knowledge about key words, Data type different types of operator, statements: do, while statements and able to construct simple C program by using their knowledge and apply them in various kinds of fields.

CO4: gain a clear knowledge of Sequence of Functions their convergence, Uniform convergence and integration, uniform convergence and differentiation.

CO5: understand about Power Series , to perform term to term integration and differentiation of Power Series, convergence of Power Series and to solve simple problems related Power Series.

CO6: know about Fourier Series and its application to solve problems, Dirichlet's conditions for convergence of Fourier Series.

CO7:solve the Ordinary Differential Equations using Method of variation of parameters and Method of undetermined coefficients. Gain idea to solve simple Eigen value problems.

CO8: gain a basic knowledge about Partial Differential Equation, its formation and its solutions using Lagrange's method.

CO9: know about the Laplace Transform and how to use it in solving Ordinary Differential Equations, elementary properties of derivatives and integrals.

CO10: gain a preliminary knowledge in Integers, Division algorithm, integral solutions of ax+by=c this type of equations, Unique factorization theorem.

CO11: know about Congruence, its definition and properties, Euler's phi function and its application, understand the Chinese Remainder theorem, to check digits in ISBN, UPC and credit cards.

CO12: gain a clear concept about Boolean Algebra , Huntington postulates for Boolean Algebra, understand Algebra as an examples of Boolean Algebra , and know design of simple switching circuits. They gain the knowledge of Boolean Algebra to apply this in various fields.

Paper – VII(B)

Course Title: Practical: Numerical Methods

Course Outcomes:

This course offers the students to:

CO1: apply their knowledge of Numerical Analysis practically by solving some problems using Scientific Calculator and C programming. Students are able to solve the solutions using Bisection method, Fixed point iteration method, Newton - Raphson method, Regula-Falsi method. Also know Numerical Integration- Trapezoidal rule, Simpson's 1/3 rule.

Programme Specific Outcomes of Three Year Honours in Geography

- The three year Honours program in Geography will provide a comprehensive knowledge to the students in the fundamentals of geographical theories and application of such theories for formulation of policies and planning.
- The course will also enable the students to develop a thorough knowledge of geographical and statistical concepts used in the analysis of socio-economic, cultural and environmental problems which will foster analytical thinking among the students.
- Exposure to field work and preparation of project report along with the use of questionnaire and data collection will provide a means of contextualising students' learning and contributing to students' cognitive development, enabling them to understand the relationships between groups of geographical factors, thereby bridging the divide between the classroom and the real world.
- The course will also help in enhancing the skills of the students in applying different cartographic and statistical techniques in computing the data and derive effective conclusions. With the handling of weather instruments as well as levelling and surveying instruments, the students will be able to assess the dynamics of the earth's surface and atmosphere. The course will also help in enhancing the skills of the students by providing the students with the knowledge of application of remote sensing and GIS techniques, along with different geo tools, both theoretically and practically for land use mapping, urban sprawl analysis, forests monitoring etc.
- The course will also provide an understanding of the relationship between the environment and human activities in different sectors of the economy and explore the contemporary issues associated with population-resource relationship and regions and make approaches to hazard study, natural and man induced, in terms of risk perception and vulnerability assessment.
- On completion of the course, the students will develop the ability to analyse geographical behaviour and express the geographical and environmental point of view of any problem. It will also foster students' ability to analyse events, historical and contemporary, from a geographical perspective.

Course Specific Outcomes of Three Year Honours in Geography

CC 1 Theory - Geotectonic

- To understand the basic concepts of the earth's tectonic and structural evolution with reference to geological time scale.

- To understand the earth's interior with special reference to seismology and theories of isostasy.
- To explore the theory of global tectonics and the associated formation of major relief features of ocean floors and continents including constructive, destructive and conservative plate margins and sea floor spreading.
- To have a better knowledge of folds, faults, their classifications and surface expressions and learn about the earthquakes and volcanoes and associated landforms.

CC 1 Practical

- To have a better knowledge of the concept of scale and construction of plain, comparative, diagonal and vernier scale graphically.
- To understand Map Projection and learn about calculations and techniques of construction of Polar Zenithal Stereographic Projection, Bonne's Projection, Mercator's Projection and Universal Transverse Mercator (UTM) Projection.

CC 2 Theory – Geomorphology

- To introduce to the students the nature, scope and fundamental concepts of Geomorphology.
- To explore different geomorphic processes such as weathering and mass wasting and cycle of erosion as postulated by Davis and Penck.
- To have a better understanding of the classification and evolution of fluvial, karst, aeolian, glacial and coastal landforms.
- To acquaint themselves with different slope forms, processes, factors and the associated landforms as well as the slope evolution theories as proposed by different geomorphologists.

CC 2 Practical

- To study topographical maps and learn about the techniques of - interpreting mountain area with the help of cross and longitudinal profile, interpreting relief profile using superimposed, projected and composite techniques and analysing slope with the help of Wentworth's Method and Smith's Method.
- To have knowledge about the identification of different types of rocks and minerals.

CC 3 Theory – Human Geography

- To define and understand the major themes of Human Geography and their relevance in contemporary world.

- To explore different components of space and society and have knowledge about the cultural regions in the context of race, religion and language.
- To enable students to have knowledge about the population growth, distribution and composition with special reference to India and the associated Demographic Transition Theory.
- To understand the relationship between population and resource and learn about the different Population-Resource Regions.

CC 3 Practical

- To have knowledge of representing the computed data diagrammatically in the form of line, bar and circle.
- To learn about properties, uses and limitations of different thematic mapping techniques and representing data by these techniques such as Proportional Cubes, Choropleth, Chorochromatic, Dot and Isopleths.

CC 4 Theory – Settlement Geography

- To have a basic knowledge about the origin and growth of rural and urban settlements.
- To understand the classification and morphology of rural and urban settlements.
- To understand the trends and patterns of world urbanization with special reference to India.
- To understand the theories of urban growth.

CC 4 Practical

- To gain knowledge about the basic concept of levelling and surveying and learn about levelling by Dumpy Level and determination of height of an object by Theodolite.
- To learn about the preparation and interpretation of thematic maps by conventional method.

CC 5 Theory – Climatology

- To have knowledge about the composition and structure of atmosphere and the associated phenomena of heat budget and temperature inversion.
- To have an understanding of the atmospheric pressure and wind system with special emphasis on jet streams and monsoon.
- To understand the forms of atmospheric moisture with more focus on precipitation and climatic regions as proposed by Koppen.
- To gain knowledge about the tropical and extra tropical cyclones.

CC 5 Practical

- To learn handling of the weather instruments and recording of the data.
- To learn interpretation of Indian daily weather report, summer and winter case and representation of climatic data by climographs and hythergraphs.

CC 6 Theory – Statistical Methods in Geography

- To explore the significance of statistical methods in Geography.
- To understand the source and use of data and scale of measurement in Geography.
- To gain knowledge about the different sampling techniques, their merits, demerits and usages.
- To have knowledge regarding the theoretical distribution including probability and normal distribution.

CC 6 Practical

- To gain knowledge about the tabulation of data by using different statistical techniques including Measures of Central Tendency, Centrographic techniques and Measures of Dispersion.
- To learn about the analysis of data by using different statistical techniques of association and correlation including Rank Correlation, Product Moment Correlation and Simple Regression.

CC 7 Theory – Geography of India

- To enable the students to identify the physiographic regions of India based on relief and topography and explore the characteristics and classification of soil, natural vegetation and climate of India.
- To gain knowledge about the distribution and utilisation of mineral and power resources, agricultural production and distribution of rice and wheat, development of automobile industry and Information Technology with reference to India.
- To understand the distribution of population in terms of race, caste, religion, language, tribes and their correlates.
- To gain knowledge about the Physiographic, Socio-cultural and Economic Regionalisation of India after R. L. Singh, Sopher and Sengupta respectively.

CC 7 Practical

- To learn illustration of temperature and rainfall graphs of selected stations from different physiographic regions of India.

- To gain knowledge about the measurement of arithmetic growth rate of population, comparative analysis of different decadal datasets and measures of inequality.

SEC 1 Theory – Remote Sensing

- To understand the concepts and principles of remote sensing technologies and the history of their development; platforms, types and photogrammetry.
- To understand the principles of Satellite Remote Sensing, the methodologies of extracting data from remotely sensed imagery, EMR interaction with atmosphere and earth's surface, different types of satellites and sensors.
- To acquaint themselves with Digital and Manual Image Processing; Radiometric and Geometric Correction Pre-Processing; filtering and Supervised and Un-supervised Classification.
- To learn about the interpretation of satellite image.

CC 8 Theory – Economic Geography

- To understand the concept of economic activity, the factors affecting its location with special reference to agriculture and industry.
- To understand the relationship between the environment and human activities in the primary sector of the economy.
- To acquaint themselves with the factors that led to the establishment and development of secondary activities.
- To comprehend the level of interactions between man and his environment in the tertiary sector.

.**CC 8 Practical**

- To learn about the transport network by analysing connectivity and accessibility.
- To learn about the use of thematic maps in representing variation in different components of labour force and comparative analysis of developed and backward states by composite index.

CC 9 Theory – Regional Planning and Development

- To define region and understand the evolution and types of regional planning; to ascertain the needs for regional planning.
- To understand the characteristics of ideal planning region and delineate different planning regions.
- To understand the Growth Pole Model of Perroux, Growth Centre Model in Indian context and theories of Myrdal and Rostow.

- To gain knowledge about the social, economic and environmental indicators of development and human development.

CC 9 Practical

- To learn about the delineation of formal and functional regions by weighted index method and breaking point analysis.
- To learn measuring inequality and regional disparity by Location Quotient method and Sopher Index.

CC 10 Theory – Field Work and Research Methodology

- To understand the role, value, data and ethics of field work in geographical studies.
- To define and identify the case studies of rural, urban, physical, environmental and human.
- To have knowledge about the merits, demerits and selection of appropriate field techniques, types of observation – participant and non-participant, questionnaires – open, closed, structured and non-structured, interview and space survey.
- To understand research problems and formulation of research objectives and hypothesis.

CC 10 Practical

- To learn about the use of field tools and collection of data for physical and socio-economic surveys.
- To gain knowledge about designing the field report including aims, objectives, methodology, analysis, interpretation and writing the report.
- To have first hand knowledge in the field, collect primary and secondary data and prepare a field report with the help of figures, tables, maps, photographs, references and appendices which should reflect original interpretation of the theme based on field observations.

SEC 2 Theory – Geographical Information System

- To have an understanding of the basic concepts and components of Geographical Information System.
- To gain knowledge about the principles and uses of Global Positioning System and Differential Global Positioning System (DGPS).
- To understand spatial, non-spatial, raster and vector data structure.
- To have an understanding of the input, geo-referencing, editing, output, query and overlays of GIS Data Analysis.

- To gain knowledge about the application of GIS in land use mapping, urban sprawl analysis and forests monitoring.

CC 11 Theory – Environmental Geography

- To understand the concept and scope of Environmental Geography and know about the physical and socio-cultural components of environment.
- To gain knowledge about the man-environment relationship, its historical progression and adaptation of man in different types of biomes.
- To understand the concept, structure, functions and problems of ecosystem with special reference to tropical and temperate ecosystems.
- To help students gain knowledge on the environmental programmes and policies at national, regional and global level.

CC 11 Practical

- To have knowledge on the preparation of questionnaire for perception survey on environmental problems.
- To prepare a project report on environmental problems of North Bengal based on primary and secondary data with the help of figures, tables, maps, photographs, references and appendices.

CC 12 Theory – Remote Sensing and GIS

- To have a basic knowledge about the components, development, platforms and types of Remote Sensing and GIS.
- To learn skills to identify, extract and determine the scales and orientation of Aerial Photos; principles of Remote Sensing; EMR interaction with atmosphere and earth's surface and different types of satellites and sensors.
- To understand spatial, non-spatial, raster and vector GIS data structure.
- To gain knowledge about the interpretation and application of GIS in land use/land cover mapping, urban sprawl analysis and forests monitoring.

CC 12 Practical

- To learn air photo interpretation with the help of pocket stereoscope and satellite imagery interpretation.
- To have understanding of digital and manual image processing, supervised and unsupervised classification, georeferencing, editing and output and overlays.

DSE 1 Theory – Population Geography

- To understand the nature and scope of Population Geography and sources of data with special reference to India
- To have knowledge about the size, distribution and growth of population, determinants and patterns of population and understand the Malthusian and Demographic Transition Theory.
- To understand the dynamics of population i.e. fertility, mortality and migration; its measures, determinants and implications.
- To understand population in terms of its composition and characteristics and explore into its contemporary issues such as ageing of population, declining sex ratio and HIV/AIDS.

DSE 1 Practical – Population Geography

- To learn about projection of population by arithmetic method and population density mapping for India.
- To analyse work participation rate by total and gender wise for India and occupation structure by dominant and distinctive functions for West Bengal.

DSE 2 Theory – Urban Geography

- To have an understanding of the nature and scope of Urban Geography.
- To identify and understand the patterns of urbanisation in developed and developing countries.
- To acquaint themselves with quantitative and qualitative methods of classifying urban centres based on functionality.
- To analyze the problems and prospects of urbanization in selected urban areas through case studies.

DSE 2 Practical – Urban Geography

- To gain knowledge about hierarchy of settlements by Rank-size rule method.
- To learn spatial and temporal analysis of urban growth of different states using Census data of India.

CC 13 Theory – Evolution of Geographical Thought

- To trace the history and development of geographical thought from the ancient period to the present era.
- To gain knowledge on the evolution of geographical thinking and disciplinary changes in Germany, France, Britain and United States of America.
- To debate on Systematic, Regional, Environmental Determinism and Possibilism.

- To have knowledge with regard to trends in geographical thought from Quantitative Revolution and its impact to Behariouralism, Feminism to Post Modernism and changing future concepts in Geography.

CC 13 Practical

- To learn about important quantitative techniques in Geography – Chi square, Standard Score, Ranking Coefficient by Kendall.
- To learn crop combination by Weber, Rafiulla and Doi.

CC 14 Theory – Disaster Management

- To gain knowledge on the concept and classification of hazards and disasters.
- To understand approaches to hazard study in terms of risk perception and vulnerability assessment.
- To have knowledge about the factors, consequences and management of earthquake, landslide, flood and riverbank erosion.
- To examine the causes of fire hazard, chemical and industrial accidents and assess the impact of such human induced hazards on the environment and population.

CC 14 Practical

- To prepare a project report on any natural hazard or human induced disaster based on primary and secondary data collected from local area with the help of figures, tables, photographs, maps, references and appendices.

DSE 3 Theory – Political Geography

- To understand the concepts, nature and scope of Political Geography.
- To understand the concept of State, Nation and Nation State and Geopolitics, attributes of state – frontiers, boundaries, shape, size, territory and sovereignty and learn about the theories of Heartland and Rimland.
- To introduce the concepts of resource conflicts with special emphasis on water sharing disputes and conflicts related to forest rights and minerals.
- To gain knowledge about the politics of displacement in terms of issues of relief, compensation and rehabilitation with reference to dams and Special Economic Zones.

DSE 3 Practical – Political Geography

- To prepare spatial distribution maps of India in terms of gender, caste and religion and analyse migration data with reference to rural to urban and urban to urban migration.
- To prepare checklist of indices for Social Impact Assessment.

DSE 4 Theory – Social Geography

- To understand the concept, origin, nature and scope of Social Geography.
- To have an understanding of the technology in relation to occupational change and migration.
- To learn about the different social categories including caste, class, religion, race and gender and their spatial distribution.
- To gain knowledge about the concept and components of welfare and wellbeing – healthcare, housing and education, social geographies of inclusion and exclusion and slums.

DSE 4 Practical – Social Geography

- To prepare flow chart showing migration trends.
- To represent spatial distribution of caste, religion and gender in India using proportional circles and proportional divided circles.

Program Specific Outcomes of Three Year Program Course in Geography

- Completion of the Program Course in Geography will enable the students to understand the basic concepts of geography and the related theories. The course will also provide the students an idea of geographical and statistical concepts used in the analysis of various problems which will strengthen numerical aptitude and foster analytical thinking among the students.
- Exposure to field work and preparation of project report along with the use of questionnaire and data collection will enable the students to understand the relationships between groups of geographical factors, thereby bridging the divide between the classroom and the real world. The course will also help in enhancing the skills of the students in applying different cartographic and statistical techniques in computing the data and derive effective conclusions.
- The course will also help in enhancing the skills of the students by providing the students with the knowledge of application of remote sensing and GIS techniques and their applications. The course also provides students knowledge regarding the theories of development along with a basic knowledge of different plans and policies of the government.

Course Specific Outcomes of Three Year Program Course in Geography

CC 1 Theory – Physical Geography

- To understand the earth's interior with special reference to seismology.

- To have knowledge about the theory of Plate Tectonics and the associated processes and formation of major relief features of ocean floors and continents.
- To understand the types of folds and faults and the associated surface expressions.
- To have a better understanding of the classification and evolution of fluvial, aeolian, glacial and coastal landforms.

CC 1 Practical

- To have a better knowledge of the concept of scale and construction of plain, linear, comparative, diagonal and vernier scale.
- To understand Map Projection and learn about calculations and techniques of construction of Zenithal Gnomonic Projection (Polar Case), Cylindrical Equal Area Projection (Equatorial Case), Simple Conical Projection with one standard parallel and Sinusoidal Projection.

CC 2 Theory – Human Geography

- To understand the basic scope and content of Human Geography.
- To have an understanding of the cultural regions in terms of race, religion and language with reference to India.
- To enable students to have knowledge about the population growth, distribution and composition with special reference to India.
- To understand the relationship between population and resource and learn about the different Population-Resource Regions.

CC 2 Practical

- To have knowledge of representing the computed data diagrammatically in the form of line, bar and circle.
- To learn about properties, uses and limitations of different thematic mapping techniques and representing data by these techniques such as Proportional Circles, Proportional Divided Circles and Choropleth.

CC 3 Theory – Regional Development

- To define region, understand the evolution and types of regional planning and delineate different planning regions.
- To gain knowledge about the causes of regional imbalances and problems of functional regions.
- To understand the Growth Pole Model of Perroux and strategies for regional planning.

- To gain knowledge about the problem regions especially backward regions and evaluate regional plans with major focus on Special Area Development Plans in India.

CC 3 Practical

- To interpret Indian Topographical Maps with special reference to plains and plateaus taking physiography, drainage, natural vegetation, settlement, transport and communication into consideration.
- To learn Geological Maps and explore uniclinal and folded geological structure.

SEC 1 Rural Development

- To understand the concepts, basic elements and measures of rural development.
- To gain knowledge about the conceptual framework – Gandhian approach to rural development, Lewis Model of Economic Development.
- To have area based approach to rural development and identify drought prone area programmes and PMGSY.
- To have target group approach to rural development and identify different State and Central Government aided development programmes like SJSY, MNREGA, Jan Dhan Yojna and Rural Connectivity.
- To gain knowledge on Panchayati Raj System, rural development policies and programmes in India.

CC 4 Theory – Spatial Information Technology

- To introduce students to concept and historical development of Spatial Information Technology.
- To understand web data sources, registration and projection, data structures, data interpretation and modelling of spatial information.
- To explore the functions of spatial information system – Information retrieval, Topological modelling, networks, overlay and data output.
- To gain knowledge on different applications of Spatial Information Technology.

CC 4 Practical

- To identify broad physical and cultural features from aerial photographs using pocket stereoscope.
- To learn about statistical techniques like measures of central tendency and measures of dispersion.

SEC 2 Geographical Information System

- To have an understanding of the basic concepts and components of Geographical Information System.
- To gain knowledge about the principles and uses of Global Positioning System and Differential Global Positioning System (DGPS).
- To understand spatial, non-spatial, raster and vector data structure.
- To have an understanding of the input, geo-referencing, editing, output, query and overlays of GIS Data Analysis.
- To gain knowledge about the application of GIS in land use mapping, urban sprawl analysis and forests monitoring.

DSE 1 Theory – Disaster Management

- To understand the concept and classification of hazards and disasters and their risk and vulnerability.
- To have knowledge about the causes, impact, distribution and mapping of flood, landslide and drought with reference to India.
- To gain knowledge on the causes, impact, distribution and mapping of earthquake, tsunami and cyclone with reference to India.
- To have an understanding of the preparedness, Indigenous Knowledge and Community Based Disaster Management mitigation measures to different disasters and gain knowledge about National Disaster Management Authority and National Institute of Disaster Management.

DSE 1 Practical

- To prepare a project report on disaster, natural or human-induced taking a case study, based on primary and secondary data with the help of figures, tables, maps, photographs, references and appendices.

DSE 2 Theory – Rural Development

- To gain knowledge on the interdependence of rural and urban sectors of the economy, need for rural development and Gandhian approach to rural development.
- To understand the Panchayat Raj System, agriculture and allied sectors, seasonality and need for expanding non-farm activities, co-operatives and PURA.
- To have area based approach to rural development and identify drought prone area programmes and PMGSY.

- To have target group approach to rural development and identify different State and Central Government aided development programmes like SJSY, MNREGA, Jan Dhan Yojna and Rural Connectivity.

DSE 2 Practical

- To prepare a project report on socio-economic status of the people either at mouza or village level based on primary and secondary data with the help of figures, tables, maps, photographs, references and appendices

2.6

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution are stated and displayed on website and communicated to teachers and students

UNDER GRADUATE DEPARTMENTS

Outcomes of the course: Three-year Degree Course in English Honours and Programme

- Students have been taught English literature in Honours Course and Programme Course.
- They learn a wide variety of literary pieces ranging from British, American, Greek to Indian.
- They also learn literary theories and criticism.
- By all this, they learn to appreciate literature, philosophy, history and society.
- The course aims to produce students with minds ignited to 'think'.
- Students are taught English communication which is required for jobs in public sphere especially in the Communication media.
- Students have been taught Business Communication (under SEC) that includes writing project report, annual report of companies, reports of field work, E-correspondence etc.
- They learn functional English under AECC-2 and LCC-2.
- They learn Editing and Proof -reading that prepare them for jobs as journalists.
- This helps them to learn English as a world language and be able to accurately and precisely communicate both in speaking and writing in a variety of contexts and genres.
- They try to acquire analytical skills in linguistics, communications and literary criticism and be able to analyze oral and written discourse of various genres with regard to social, cultural, political and historical contexts.
- A potential for careers and advanced studies in a wide range of English, Public relations or Communication fields.
- A broad foundation of knowledge and skills and cultivate a commitment to life-long learning and be prepared to pursue inquiry relevant to other academic and professional fields and personal interests.
- A potential to be articulate, conscientious leaders and problem solvers who are committed to contributing to their fields and society and be prepared to think critically and creatively and conceive real-world problems from different perspectives.

COURSE OUTCOME

History of English Literature

The students of History of English Literature will be able to:

CO1: Understand significant development in the history of English Literature.

CO2: Develop a passion for literature and appreciate literature's ability to elicit feeling, cultivate the imagination and call us to account us as humans.

CO3: Develop working knowledge of the principal works, authors, genres and periods of English Literature.

CO4: Read a variety of texts critically and proficiently to demonstrate in writing or speech the comprehension, analysis and interpretation of those texts.

CO5: Demonstrate knowledge and comprehension of major texts and traditions of literature written in English as well as their social, cultural, theoretical and historical contexts.

Classical Literatures

The students of Classical Literatures will be benefitted as follows:

CO1: Ancient literatures of Greece, Rome, and India have been taught to make students aware of the formative eras of our literatures.

CO2: An awareness of the origin and development of European literatures.

CO3: A proper understanding of our glorious cultural past through works of the masters such as Kalidasa, Sudraka, Homer.

Poetry and Short Stories

The students of Poetry and Short Stories will be able to:

CO1: Understand the characteristics of various literary genres.

CO2: Develop analytical skills and critical thinking through close reading of literary texts.

CO3: Cultivate appreciation of language as an artistic medium and understand the importance of forms, elements and style that shape literary works.

CO4: Understand that literature is an expression of human values within a historical and social context.

CO5: Recognize the culture and context of the works of literature thereby developing sensitivity to nature and fellow human beings.

Drama

The students of Drama will learn to:

CO1: Understand the historical and socio-political background of Drama in Literature.

CO2: Understand the concepts of religious drama, tragedy, comedy and contemplate their philosophical and psychological relevance.

CO3: Critically analyze, understand and make an informed critique on characters and situations thus developing their analytical skills.

CO4: Think critically and creatively and conceptualize real-world problems from different perspectives.

CO5: Develop empathy and sensitivity, and develop the competence to solve problems.

Women's Writings

The students of Women's Writings will be able to:

CO1: Recognize and discuss the different aspects of feminist theories and criticism.

CO2: Possess critical and analytical faculties enabling greater insight while studying a literary text.

CO3: Appreciate the impacts and influence of the social, cultural, political, historical and legal facets on women's writing.

CO4: Acquire enhanced awareness of the perception of gender roles assigned to both sexes in view of the cultural context.

CO5: Provide an in-depth understanding of the theories associated with women's writings.

Postcolonial Literatures

The students of Postcolonial Literatures will learn to:

CO1: Understand the history of colonialism and anti-colonial struggles in different countries.

CO2: Understand the theorization of colonialism and anti-colonial struggles in the form of postcolonial theory.

CO3: Learn to understand postcolonial societies through the prism of postcolonial literatures.

CO4: Understand India which was a colony once.

Literary Theory and Criticism

Students of Literary Theory and Criticism will learn

CO1: Modernism, Postmodernism, Feminism, Postcolonialism.

CO2: To have an understanding of the history of Literary Theory and Criticism.

CO3: Understand literature better with a mind informed by critical theories.

CO4: How to become critical readers of text from ordinary readers.

Partition Literature

Students of Partition Literature will learn:

CO1: To understand the history of India's Partition of 1947.

CO2: To read the alternative history of Partition through literature.

CO3: To develop a literary mind informed by alternative knowledge of history, critical thinking of the past and the present, and a self-conscious vision of futue.