

COURSE DETAILS

BSC SEM-I P-I

COURSE CODE:21.010

Name of Department :- Mathematics

Name of Course :- Infinity series and Trigonometry

B.Sc. First semester (Paper Ist).

Course Objective :- The objective of this course is to develop an understanding of convergence of series and sequence in its simplest setting.

Course Outcomes

- I. Students will be able to solve the problems related to convergence or divergence of an Infinity Series and Sequence.
- II. Students will be able to find an Infinity Series with the help of given sequential terms.
- III. By Debates it is found that students will be able to find the result by summation of sequential data obtain from various fields.
- IV. Students gain knowledge about a periodic function and trigonometric function and there graphical transformation.
- V. Students will be able to solve the problem related to summation of sine and cosine series.

Text Book

- I. Krishna Publisher by J.N. Sharma
- II. S. Chand Publisher

Reference Book

- I. By konrad Knopp

COURSE DETAILS

BSC SEM-I P-II

COURSE CODE:21.020

Department – Mathematics

Name- calculus-I

B.Sc. First semester (Paper IInd).

Course Objective :

The main objective of calculus is to solve problems involving rates of change of variables subject to a functional relationship.

Course Outcomes

1. Students can verify the value of limit of a function at 4 point using the definition of limit.
2. Students can calculate the limit of function at a point numerically and algebraically using appropriate techniques.
3. Students can understand the consequences of the intermediate value theorem for continuous functions.
4. Student can find the points of discontinuity for functions and classify them.
5. Students can be able to check whether a function is differentiable at point.

Assessment Methods - Written exams.

Text Book

- i. Krishna publisher
- ii. Ram Prasad

Reference Book

COURSE DETAILS

BSC SEM-I P-III

COURSE CODE:21.030

Name Of The Department: *Mathematics*

Name Of The Course(Paper):Vector Calculus &Analytical Geometry of two Dimensions.

B.Sc. First semester (Paper IIIrd).

Course Objective: The objective of this course to enable the students to learn the principles of Vector Calculus and its application besides Analytical Geometry of two Dimensions.

Course Outcomes: This course is designed to provide students comprehensive knowledge and concepts of

(1) Vector differentiation and integration.

(2) Compute the gradient, curl and divergence of a vector field.

(3) calculate and apply line and surface integrals using the fundamental theorem ,Green's theorem , Stoke's theorem and divergence theorem.

(4) identify and tracing of conics.

(5) knowing about polar equation of a conic.

Assessment Methods: Participation, Attendance, Homework, Quizzes and Exams during the semester.

References:

(1) Shanti Narayan A Textbook of vector calculus. S.Chand& Co. New Delhi.

(2) S.L loney. The elements of co-ordinate Geometry, Macmillan and Company, London.

(3) Gorakh Prasad & H.C Gupta. Text Book on Co-ordinate Geometry, Pathshala Pvt Ltd. Allahabad.

COURSE DETAILS

BSC SEM-II P-I

COURSE CODE:21.040

Name of Department :- Mathematics

Name of Course :- Algebra (Group, Subgroup, Ring field)

B.Sc. Second semester (Paper Ist).

Course Objective :- Characteristics of sets with various binary operations.

Course Outcomes

- I. Students gain knowledge that how a set became group for the given binary operation.
- II. By Debates it is seen that maximum students are able to solve the questions related to permutation group.
- III. Students gain knowledge of some fundamentals Result and techniques from the theory of finite groups.
- IV. Students will be able to find the order of groups and there subgroups and Isomorphic relation between groups.
- V. Students will be able to explain how a set became field, Integral domain.

Text Book

- I. Krishna Publisher by J.N. Sharma
- II. S. Chand Publisher

Reference Book

- I. By Vijai K Khanna
- II. S.K. Bhambri
- III. Joseph A. Gallian

COURSE DETAILS

BSC SEM-II P-II

COURSE CODE:21.050

Name of Department :- Mathematics (II sem. paper II)

Name of Course :- Singular points, curve tracing and Integral Calculus.

B.Sc. Second semester (Paper IInd).

Course Objective :- To give knowledge of curve tracing and to use fundamental theorem of integral calculus to evaluate definite integrals.

Course Outcomes

1. Students will be able to compute the critical points of a function on an interval.
2. Students will be able to Interpret the definite integral geometrically as area under the curve and length of the curve.
3. Students will be able to use the definite integral to find the surface area and volume generated by the revolution of curves about a line in its plane.
4. Students will be able to understand concept of multiple integral and change of order of integration.
5. Students will be able to calculate integrals with the help of reduction formulae and Beta, Gamma functions.

Books

Integral calculus – Gorekh Prasad

Differential Calculus – Gorekh Prasad

Integral Calculus – Shanti Narayan

COURSE DETAILS

BSC SEM-II P-III

COURSE CODE:21.060

Name of The Department: Mathematics

Name of The Course (Paper): Analytical Solid Geometry

B.Sc. IInd semester (paper IIIrd).

Course Objective: The objective of this course is to aware the students about the three dimensional geometry with visualization.

Course Outcomes:*This will help students to*

- (1) Identify and define plane, straight line, sphere, cone and cylinder.
- (2) Compute the distance between points, the distance from a point to a line, and the distance from a point to a plane in the three dimensional co-ordinate system.
- (3) Find the equation of tangent plane and normal to a conicoid.
- (4) Determine the nature the lengths and axes of the conicoid.
- (5) communicating Geometry ideas and Arguments.

Assessment Methods: Attendance, participation, Home Work and quizzes
Exams during the semester .

References:

- (1) P.K Jain and Khalil Ahmad. A Text Book of Analytical Geometry of Three Dimensions, Wiley Eastern Ltd.
- (2) N. Saran and R. S Gupta, Analytical Geometry of Three Dimensions, Pothishala Pvt Ltd. Allahabad.

COURSE DETAILS

BSC SEM-III P-I

COURSE CODE:21.070

Name of Department :- Mathematics (B.sc III sem.)

Name of Course :- Matrices.

B.Sc. IIIrd semester (Paper Ist).

Course Objective :- To discuss the characteristics of matrix.

Course Outcomes

- 1) Demonstrate ability to manipulates matrices and to do matrix algebra.
- 2) Demonstrate ability to find rank of matrix.
- 3) Demonstrate ability to find rank of matrix.
- 4) Demonstrate ability to manipulates and compute determinates.
- 5) Demonstrate ability to transform matrix to quadratics form.

Text book :-

- i. Vandana Prakashan
- ii. Krishna publisher's

Reference Book :-

- i. S. Chand

COURSE DETAILS

BSC SEM-III P-II

COURSE CODE:21.080

Name of Department :- Mathematics

Name of Course :- Differential Equation.

B.Sc. IIIrd semester (Paper IInd).

Course Objective :- To solve first order equations, higher order linear equations with constant coefficients, first order linear system with constant coefficients.

Course Outcomes

- 1) Students can solve the first order linear equation or separable equation, finding both general solution and the solution satisfying a specified initial condition.
- 2) Student will convert arbitrary higher order linear equation to first order linear system.
- 3) Student will solve non-homogeneous equations with the help of the method of undetermined coefficient and variation of parameters.
- 4) Student can solve application problem modelled by linear differential equation.
- 5) Student can identified a general method for construction solutions inhomogeneous linear constant coefficient second order equations.

Text Book

- i. Krishna Publisher
- ii. Ram Prasad Publication

Reference Book

- i. S. Chand Publication by M.D. Raisinghania

COURSE DETAILS

BSC SEM-III P-III

COURSE CODE:21.090

Name of The Department: *Mathematics*

Name of The course (paper):Statistics.

B.Sc. IIIrd semester (paper IIIrd).

Course Objective:The purpose of this course is to study the concepts of statics

Course outcomes:

- (1) To develop an understanding of the principles of statics and the ability to analyse problems in a systematic and logical manner.
- (2) A knowledge of centre of gravity.
- (3) A knowledge of forces in three dimensions
- (4)A knowledge of the principles of virtual work and catenary.
- (5) As understanding of stability.

Assessment Methods:

Attendance, Participation, Home Work and Exams during semester.

References:

- (1) S. L Loney, Statics, Macmillan and Company London.
- (2) R. S Verma, A Textbook on Statics Pothishala Pvt Ltd. Allahabad.

COURSE DETAILS

BSC SEM-IV P-I

COURSE CODE:21.100

Name of Department :- Mathematics (for B.sc IV sem.)

Name of Course :- Linear Algebra.

B.Sc. IIIrd semester (Paper Ist).

Course Objective :- Provide basic results in linear Algebra using appropriate proof-writing techniques such as linear independence of vectors properties subspace.

Course Outcomes

- 1) Students will be able to define the linear dependence and Independence of vectors.
- 2) Students will be able to find the null space of matrix and represents it as the same of independence vectors.
- 3) Students will be able to find the matrix representation of linear transformation for given basis of relevant vector spaces.
- 4) Students will be able to find the matrix of linear transformation for the given set of vectors.
- 5) Students will be able to find the linear transformation, kernel, rank and inverse of linear transformation.

Text Book

- i. Krishna Publisher by J.N. Sharma
- ii. Ram Prasad Publication by Hari Krishna

Reference Book

- i. Vikas publishing House by Vijay K Khanna

S.K. Bhambri

COURSE DETAILS

BSC SEM-IV P-II

COURSE CODE:21.110

Name of Department :- Mathematics

Name of Course :- Partial differential equation and Integral transformation .

Course Objective :- To understand how to solve linear partial differential with different methods. To Provide a systematic mathematical treatment of the theory of transformation.

Course Outcomes

- 1) Students can solve partial differential equations using separation of variables.
- 2) Students can carry out computations using distributions and Fourier transformation.
- 3) Students will be able to solve partial differential equation by using integral transformation.
- 4) Students can apply Fourier & Laplace transformation to solve boundary value problem for linear ODE.
- 5) Students will be able to solve partial differential equation to both homogeneous and non-homogeneous with constant coefficients.

Assessment Methods

Exam (Written)

COURSE DETAILS

BSC SEM-IV P-III

COURSE CODE:21.120

Name Of The Department: *Mathematics*

Name of the course (paper):Dynamics.

B.Sc. IVth Semester (Paper IIIrd).

Course Objective: The objective of this course is to present the basic principles of dynamics and help to develop proficiency in applying these principles to formulate and solve dynamics problems.

Course Outcomes:

- (1) Understanding the concepts of the kinematics.
- (2) Understanding the concept of the Simple Harmonic Motion.
- (3) Solving the problems on Elastic Strings.
- nd(4) Applying the knowledge of Motion in Resisting Medium.
- (5) Knowing and solving problems on central orbits and Kepler's law of Motion.

Assessment Methods: Attendance, Participation, Home Work, quizzes and Exams during Semester.

References:

- (1) S. L Loney. An Elementary Treatise on the dynamics of a particle and of Rigid bodies. Cambridge university.
- (2) A. S Ramsey dynamics, part 1, Cambridge university.

COURSE DETAILS

BSC SEM-V P-I

COURSE CODE:21.130

Name of Department :- Mathematics

Name of Course :- Real Analysis .

Course Objective :- Prove various theorem about Riemann integrals, improper integrals and series of arbitrary terms.

Course Outcomes

Students will be able to

- 1) Prove the theorems about Riemann sums and Riemann integrals.
- 2) Find the convergence and divergence of infinity series.
- 3) Calculate improper integrals with the help various theorems.
- 4) Differential functions of more than one variables.
- 5) Transform the functions into series with the help of Fourier series transformation.

Text Book

- ii. Real Analysis by Shanti Narayan.
- iii. Real Analysis by Nisha rani.

COURSE DETAILS

BSC SEM-V P-II

COURSE CODE:21.140

Name of Department :- Mathematics (B.sc V sem.)

Name of Course :- Abstract Algebra .

Course Objective :- The objective of the course will be able the study of certain structures called groups, rings, fields and same related structures.

Course Outcomes

- 1) Introduce students to the theory of sets and use set notations as mathematical shorthand.
- 2) Providing students with opportunities to develop their reasoning faculty to becoming skilful in analyzing proofs of theorem.
- 3) Use the respective properties of identity group, rings as the course may be
- 4) Understand the Algebra of sets and representation of information on Venn-Euler's diagram.
- 5) Understand the algebra of sets of polynomials and there ring, field characteristics.

Text Book

- i. Krishna Publishers by J.N. Sharma
- ii. Ram Prasad Publishers

Reference Book

- i. Joseph A Gallian
- ii. Vijay K Khanna
- iii. S K Bhambri

COURSE DETAILS

BSC SEM-V P-III

COURSE CODE:21.150

Name Of The Department: Mathematics.

Name Of The Course (paper): Programming in 'C' and Numerical Analysis
B.Sc. Vth semester (Paper IIIrd).

Course Objective: This Course is designed to provide knowledge of C language as well as The numerical methods of solving the non-linear equations, interpolation, numerical differentiation and integration.

Course Outcomes:

- (1) Students will be able to implement input and output of the built in C data types.
- (2) To understand and make use of flow charts and programming.
- (3) Explain the components of computer and logical operators.
- (4) Students will be familiar with interpolation, numerical integration and differentiation.
- (5) Solving the non-linear equations.

Assessment Methods: Attendance, participation, Quizzes and Exams during the semester.

References:

- (1) V. Raja Raman, Programming in C. Prentice Hall of India.1994
- (2) Henry Mullish& Herbert L cooper, Sprit of C.
An Introduction to Modern Programming Jaico Publisher.
- (3) M.K Jain, S.R.K Iyengar, R.K Jain Numerical Methods Problems and Solutions New Age International Ltd 1996.
- (4)S.S Shastry Introduced Methods of Numerical Analysis, Prentice Hall of India.

COURSE DETAILS

BSC SEM-V P-IV

COURSE CODE:21.160

Name Of The Department: Mathematics.

Name Of The Course (Paper): Probability Theory.

B.Sc. Vth semester (paper IVth).

Course Objective: The Course is aimed at providing students with a formal treatment of Probability theory and Distribution Function.

Course Outcomes:

- (1) Students will be able to understand the principles of Probability Theory.
- (2) Understanding the concept of Random Variables and Mathematical Expectations.
- (3) Recognize Probability distributions for discrete and continuous variables.
- (4) Derive Probability distributions relevant to function of random variables.
- (5) Solving the problems Binomial, Poisson and Normal Distribution.

Assessment Methods: Attendance, participation, quizzes and Exams during the semester.

References:

- (1) S.C Gupta and V.K Kapoor.
Fundamentals of Mathematical Statistics, Sultan Chand and Sons.
- (2) H.C. Saxena, Elementary Statistics, S. Chand.

COURSE DETAILS

BSC SEM-VI P-I

COURSE CODE:21.170

Name of Department :- Mathematics

Name of Course :- Complex Analysis and Metric space.

Course Objective :- This course aimed to provide an introduction of complex variable and give Knowledge of Metric space.

Course Outcomes

- 1) Students will be equipped with the understanding of fundamentals concept of complex variable theory.
- 2) Students will acquire the skill of contour integration to evaluate complicated real integral via residue calculus.
- 3) Students will be able to understand the concept of analyticity, Cauchy-Riemann concept of metric space.
- 4) Students will be able to understand the concept of open set, closed set, Boundary points and subspace of metric space.

Text Book

- i. Complex Analysis by J.N. Sharma.
- ii. Metric space by S. Tyagi.

COURSE DETAILS

BSC SEM-VI P-II

COURSE CODE:21.180

Name of Department :- Mathematics

Name of Course :- Abstract Algebra.

Course Objective :- To present the relationship between abstract algebraic structures with familiar number system and to explain the fundamentals concepts of finite group theory and finite field theory.

Course Outcomes

- 1) Students will be able to explain the notion and use the notations of sets and logic and understand the relationship between sets and logic.
- 2) Students will be able to understand the concept of relation, equivalence relation, Cartesian products, mapping and functions etc.
- 3) Students will be able to give a clear definition of groups, subgroups and understand the concept of cosets.
- 4) Students will be able to explain the significance of the notion of a normal subgroup and of a simple group.
- 5) Students will be able to explain the notion of an extension of a field.

Assessment Methods

Written Exam

COURSE DETAILS

BSC SEM-VI P-III

COURSE CODE:21.190

Name of The Department: Mathematics.

Name Of The Course (Paper): Numerical Analysis.

B.Sc.VIth Semester (Paper IIIrd).

Course Objective: To develop the basic understanding of numerical Techniques for solving Linear Equations, Ordinary differential equations and Approximation.

Course Outcomes:

- (1) To solve applied linear algebra.
- (2) Find the Eigen values and Eigen vectors to diagonalise and reduce a matrix to tridigonal Form.
- (3) Compute solutions for ordinary differential equations through numerical techniques.
- (4) Analyse a mathematical problem and determine technique to use to solve it.
- (5) Having a better understanding of different types of Approximation.

Assessment Methods: Attendance, Participation, Quizzes and Exams during the semester.

References:

- (1)M.K Jain, S.R.K Iyengar, R.K Jain Numerical Methods Problems and Solutions New Age International Ltd 1996.
- (2)S.S Shastri Introduced Methods of Numerical Analysis, Prentice Hall of India.

COURSE DETAILS

BSC SEM-VI P-I

COURSE CODE:21.200

Name of The Department: Mathematics.

Name Of The Course (Paper):linear Programming and optimization.

B.Sc. VIth Semester (paper IVth).

Course Objective: This course emphasizes setting up optimization of linear programming problems using Simplex method and the role of duality.

Course outcomes: Students will be able to

- (1) Understand about linear programming.
- (2) Solve linear programming problems using graphical and simplex algorithm.
- (3) Apply the simplex method for solving linear programming problems.
- (4) Formulate the necessary and sufficient optimality conditions for linear programming.
- (5) Explain the need for duality theorem and its use in solving linear programming problems.

Assessment Methods: Attendance, Participation, Quizzes and Exams during the semester.

References:

- (1) G.Headley Linear programming Narosa publishing House 1995.
- (2) Kanti Swaroop,P.K Gupta and Manmohan Operation Research, Sultan Chand & Sons New Delhi.