CC–I DIFFERENTIAL AND INTEGRAL CALCULUS

Objectives
1. To expose the students to various techniques of integration.
2. To study concepts of definite integrals.

UNIT – I :

Methods of Successive Differentiation – Leibnitz's Theorem and its applications – Increasing and Decreasing functions.

UNIT – II :

Curvature –Radius of Curvature in Cartesian and in polar coordinates – Centre of curvature – Evolutes and Involutes.

UNIT – III :

Integration by parts – Definite Integrals and reduction formulae.

UNIT – IV :

Double Integrals – Changing the order of Integration – Triple Integrals.

UNIT – V :

Beta and Gamma functions and relation between them – Integration using Beta and Gamma functions.

TEXT BOOKS:

[1] T.K. Manickavasagam Pillai and others Differential Calculus, volume– I
S.V. Publications, Chennai- Reprint 2002.

[2] T.K. Manickavasagam Pillai and others, Integral Calculus, volume –II
S.V.Publications, Reprint 2002.

UNIT - I   : Chapter 3 (sections 1.1 to 2.2) and
Chapter 4 (sections 2.1 , 2.2) of [1]
UNIT - II   : Chapter 10 (sections 2.1 to 2.6) of [1]
UNIT - III   : Chapter 1 (sections 11, 12 and 13) of [2]
UNIT - IV   : Chapter 5 (sections 2.1, 2.2) and (section 4) of [2]
UNIT - V   : Chapter 7 (sections 2.1 to 2.5) of [2]

REFERENCE(S):

[1] Duraipandian and Chatterjee, Analytical Geometry.
[2] Shanti Narayanan , Differential and Integral Calculus.

CC-II ANALYTICAL GEOMETRY (3D) AND TRIGONOMETRY

Objectives
1. To study three dimensional Cartesian Co-ordinates system.
2. To introduce the basic concepts of Vector Calculus.

UNIT – I:
      Coplaner lines – Shortest distance between two skew lines – Equation of the Line of shortest distance.

UNIT – II:
      Sphere – Standard equation – Length of a tangent from any point – Sphere passing through a given circle – Intersection of two Spheres.

UNIT – III:

      Expansions of $\sin(nx)$, $\cos(nx)$, $\tan(nx)$ – Expansions of $\sin^n x$, $\cos^n x$ – Expansions of $\sin(x)$, $\cos(x)$, $\tan(x)$ in powers of x.

UNIT – IV:
      Hyperbolic functions – Relation between hyperbolic and circular functions – Inverse hyperbolic functions.

UNIT – V:
      Logarithm of a complex number – Summation of Trigonometric series – Difference method – Angles in arithmetic progression method – Gregory's Series.

TEXT BOOKS

[1] T.K. Manickavasagam Pillai and T.Natarajan Analytical Geometry,part–II [Three Dimensions] S.V. publications,Chennai – Reprint – 2002

[2] S.Arumugam and others , Trigonometry And Fourier series New Gamma publications –1999.

UNIT - I : Chapter 3 (sections 7 and 8) of [1]
UNIT - II : Chapter 4 (sections 1 to 8) of [1]
UNIT - III : Chapter 1 (sections 1.2 to 1.4) of [2]
UNIT - IV : Chapter 2 (sections 2.1 and 2.2) of [2]
UNIT - V : Chapter 3 and Chapter 4 (sections 4.1, 4.2 and 4.4) of [2]

REFERENCE(S)

[1] S.Arumugam and Isacc , Calculus, volume I, New Gamma Publishing House, 1991

[2] S.Narayanan, T.K Manickavasagam Pillai,Trigonometry, S.Viswanathan Pvt Limited and Vijay Nicole Imprints Pvt Ltd, 2004.

CC – III ALGEBRA AND THEORY OF NUMBERS

Objectives:
1. To study the relation between the roots and coefficients and nature of the roots.
2. To study the concepts of Weirstrass inequalities, Cauchy's inequality and application of Maxima and Minima functions.

UNIT – I :

Relation between the roots and coefficients of polynomial Equations – Symmetric functions – Sum of the rth powers of the roots – Two methods [Horner's method and Newton's Method].

UNIT – II :

Transformations of Equations – (Roots with sign changed – Roots multiplied by a given number–Reciprocal roots) – Reciprocal equations – To increase or decrease the roots of given equation by a given quantity – Form the quotient and Remainder when a polynomial is divided by a binomial – Removal of terms – To form an equation whose roots are any power of the roots of a given equation.

UNIT – III :

Transformation in general – Descarte's rule of signs (Statement only–Simple problems)

UNIT – IV :

Inequalities – Elementary Principles – Geometric and Arithmetic means – Weirstrass inequalities – Cauchy's inequality – Applications to Maxima and Minima.

UNIT – V :

Theory of Numbers – Prime and composite numbers – Divisors of a given number N – Euler's function Φ (N) and its value – The highest power of a prime p contained in n! – Congruences – Fermat's, Wilson's and Langrange's theorems.

TEXT BOOK(S)
[1]   T.K. Manickavasagam Pillai and others, Algebra volume I, S.V. Publications – Reprint –1999
[2]   T.K. Manickavasagam Pillai and others, Algebra volume II, S.V. Publications – Reprint –2000
UNIT - I   :   Chapter 6 (sections 11 to 14) of [1]
UNIT - II   :   Chapter 6 (sections 15, 16, 17, 18, 19, 20) of [1]
UNIT - III   :   Chapter 6 (sections 21 and 24) of [1]
UNIT - IV   :   Chapter 4 (sections 4.1 to 4.6, 4.9 to 4.11, 4.13) of [2]
UNIT - V   :   Chapter 5 of [2]

REFERENCE

[1]   H.S Hall and S.R Knight ,Higher Algebra, prentice Hall of India, New Delhi.

CC – IV SEQUENCES AND SERIES

Objectives:
    1.To study the algebra of sequences.
    2. To study the convergence and divergence of series and the methods of testing
    the convergence.
    3. To study the binomial, exponential and logarithmic series.

UNIT – I :
    Sequence, limit, convergence of a sequence – Cauchy's general principle of convergence – Cauchy's first theorem on Limits – Bounded sequence – Monotonic sequence always tends to a limit, finite or infinite.

UNIT – II :
    Infinite series – Definitions of Convergence, Divergence and Oscillation – Necessary condition for Convergence – Convergence of $\sum \dfrac{1}{n^p}$ and Geometric series.

UNIT – III :
    Comparison test, D' Alembert's Ratio test and Raabe's test. Simple problems based on above tests.

UNIT– IV :
    Cauchy's condensation test, Cauchy's Root test and their simple problems – Alternative series with simple problems.

UNIT – V:
    Binomial theorem for rational index – Exponential and Logarithmic series – Summation of series and approximations using these theorems.

TEXT BOOK :

 [1]   T.K Manicavachagam pillai, T. Natarajan, K.S Ganapathy, Algebra, Volume – I, S.Viswanathan Pvt Limited, Chennai, 2004.

UNIT - I   : Chapter 2 (sections 1 to 7)
UNIT - II   : Chapter 2 (sections 8, 9, 10, 11, 12 and 14)
UNIT - III   : Chapter 2 (Sections13, 16, 18 and 19)
UNIT - IV   : Chapter 2 (sections 15, 17, 21 to 24)
UNIT - V   : Chapter 3 (sections 5 to 11, 14) and Chapter 4 (Sections 2, 3, 5 to 9)

REFERENCE (S) :

[1]   M.K Singal and Asha Rani Singal, A first course in Real Analysis,
     R. Chand and Co., 1999.
[2]   Dr. S.Arumugam, Sequences and Series, New Gamma Publishers, 1999.
[3]   Richard, R. Goldberg, Methods of Real Analysis
     [Oxford and IBH Publishing Co.Pvt LTD]

CC – V MATHEMATICAL STATISTICS

Objectives:
1. To make the students gain wide knowledge in probability which plays a main role in solving real life problems.
2. To frame distribution functions and its types.
3. To study the applications of Binomial and Poisson distributions.

UNIT – I :
   Correlation (two variables only) – Karl Pearson's Correlation Coefficient and its properties. Spearman's rank correlation coefficient (repeated and non-repeated). Lines of regression – Definition – Properties of regression coefficients – Simple problems.

UNIT – II :
   Uniform distribution – Definition – Mean and Variance. Normal distribution – Definition – Properties of normal distribution with proof, m.g.f, c.g.f, linear combination.Exponential distribution – Definition – m.g.f – Mean and variance only

UNIT – III :
   Sampling distribution – Chi square Variates – Definition – Derivation – Mean and variance. Student's t- Distributions – Definition – Derivation – Constant (mean and variance only) F-distribution – Definition – Derivation – Constants (mean and variance only). Relationship among t,F, chi-square distribution.

UNIT – IV :
   Test of hypothesis – Null and alternative, type I and type II errors, one tailed and two tailed tests. Level of significance, Procedure for testing hypothesis. Test of significance – Large sample tests : test of significance for single proportion, difference of proportions, single mean, difference of means – Simple problems.

UNIT – V :
   Small sample tests – t-test for single mean, difference of means and paired t-test, F-test for equality of variances. Chi-square test of goodness of fit and independence of attributes – Simple problems.

TEXT BOOK :
[1] S.C, Gupta and V.K.Kapoor . Fundamentals of Mathematical Statistics–Sultan chand and sons, Educational Publishers, New Delhi,2002.

UNIT - I	:	Chapter 10 (sections 10.4, 10.4.2, 10.7 to 10.7.3)
		Chapter 11 (sections 11.2 to 11.2.2)
UNIT - II	:	Chapter 9 (sections 9.2 , 9.2.5 , 9.2.6 , 9.2.8 , 9.3 , 9.8 ,9. 8.1)
UNIT - III	:	Chapter 15 (sections 15.1,15.2)
		Chapter 16 (sections 16.2, 16.2.1, 16.2.4, 16.5 to 16.5.2, 16.7,16.8)
UNIT - IV	:	Chapter 14 (sections 14.4.1 , 14.4.3 , 14.4.4 , 14.5 , 14.6 , 14.7.1 , 14.7.2, 14.8.3 , 14.8.4)
UNIT - V	:	Chapter 15 (sections 15.6.2, 15.6.3)
		Chapter 16 (sections 16.3.1 to 16.3.3, 16.6.1)

CC – VI MATHEMATICAL STATISTICS PRACTICAL

Objective:

To give practice on different statistical techniques using SPSS.
UNIT – I :

Calculation of mean, median, mode, G.M and H.M, Q.D, S.D and coefficient of variation. Skewness – Karl Pearson's and Bowley's coefficient of skewness.
UNIT – II :

Expectation – Expected value of a Random variable – Properties of Expectation – Variance – Co-variance – Moments of bivariate probability distributions – Conditional expectation and conditional variance.
UNIT – III :

Fitting of binomial , Poisson and normal distribution (area method only)
UNIT – IV :

Correlation – Karl Pearson's correlation coefficient, Spearman's rank correlation coefficient (repeated and not-repeated ranks). Regression lines X on Y and Y on X.
UNIT – V :

Tests of significance : Large sample tests (or) Z-test – Single proportion, difference of proportions, single mean, difference of means. Small sample tests: t-test for single mean, difference of means and paired t-test. F-test for equality of variance. Chi-square test for goodness of fit and independence of attributes.

(Five questions have to be answered out of six questions. At least one question from each unit must be asked. Each question carries ten marks).
(Practical marks – 50 and Record marks – 10)
TEXT BOOK :

[1] S.C Gupta and V.K. Kapoor . Fundamentals of Mathematical Statistics–Sultan Chand and Sons, Educational publishers, New Delhi,2002.

UNIT - I	:	Chapter 2 (sections 2.5, 2.5.1, 2.5.3, 2.6, 2.6.1, 2.7, 2.7.1, 2.8, 2.8.1, 2.9, 2.13.2, 2.13.4, 2.14.1, 2.16, 2.16.1)
UNIT - II	:	Chapter 6 (sections 6.2, 6.4 to 6.6, 6.8, 6.9)
UNIT – III	:	Chapter 8 (sections 8.4.12, 8.5.10)
		Chapter 9 (section 9.2.14)
UNIT – IV	:	Chapter 10 (sections 10.4, 10.4.2, 10.7.1 to 10.7.3)
		Chapter 11(section 11.2)
UNIT - V	:	Chapter 14 (sections 14.6, 14.7.1, 14.7.2, 14.8.3, 14.8.4)
		Chapter 15 (sections 15.6.2, 15.6.3)

CC – VII ABSTRACT ALGEBRA

Objective:

To provide concrete knowledge about the abstract concepts like sets, groups, rings and vector Spaces and their properties.

UNIT – I : Groups

Subgroups – Cyclic groups – Order of an element – Cosets and Lagrange's theorem.

UNIT – II :

Normal subgroups and Quotient groups – Isomorphisms – Homomorphisms .

UNIT – III : Rings

Definition and Examples – Elementary Properties of rings – Types of rings – Characteristics of a ring – Subrings   – Ideals – Quotient rings – Maximal and prime ideals – Homomorphism of rings – Isomorphism of rings

UNIT – IV : Vector spaces

Definition and Examples – Subspaces – Linear Transformations – Span of a set – Linear independence.

UNIT – V :

Basis and Dimension – Rank and Nullity – Matrix of a Linear Transformation .

TEXT BOOK :

[1]   S. Arumugam and A. Thangapandi Isaac, Modern Algebra , Scitech publications (India) PVT, Ltd – 2004 1st print .

UNIT - I	: Chapter 3 (sections 3.5 to 3.8)
UNIT - II	: Chapter 3 (sections 3.9 to 3.11)
UNIT – III	: Chapter 4 (sections 4.1 to 4.10)
UNIT - IV	: Chapter 5 (sections 5.1 to 5.5)
UNIT - V	: Chapter 5 (sections 5.6 to 5.8)

REFERENCE (S)

[1]   M.L.SANTIAGO, Modern Algebra, Tata,MCGraw–Hill publishing Company Limited, New Delhi.
[2]   Surjeet singh and Qazi Zameeruddin, Modern Algebra, Vikas publishing House PVT,Limited.

CC – VIII   REAL ANALYSIS

Objective:

1. To study the real number system & properties the properties of various functions

    defined on the real line.

UNIT – I :

Sets and functions : sets and elements – Operations on sets – Functions – Real valued functions – Equivalence, countability – Real numbers – Least upper bounds.

UNIT – II :

Limits and metric spaces : Limit of a function on the real line – Metric spaces – Limits in metric spaces.

UNIT – III :

Continuous functions on metric spaces : Functions continuous at a point on the real line – Reformulation – Functions continuous on metric space – Open sets – Closed sets.

UNIT – IV :

Calculus: sets of measure zero – Definition of the Riemann integral – Existence of the Riemann integral – Properties of the Riemann integral – Derivatives – Rolle's theorem – The law of the mean – Fundamental theorem of calculus.

UNIT – V :

Taylor series : Taylor's theorem – The binomial theorem – L'Hospital's rule

TEXT BOOK :

[1]   RICHARD R.GOLDBERG ,Methods of Real Analysis,
        Oxford and IBHP Publishing co, New Delhi ,1970.

UNIT - I	:	Chapter 1 (sections 1.1 to 1.7)
UNIT - II	:	Chapter 4 (sections 4.1 to 4.3)
UNIT – III	:	Chapter 5 (sections 5.1 to 5.5)
UNIT – IV	:	Chapter 7 (sections 7.1 to 7.8)
UNIT - V	:	Chapter 8 (sections 8.5 to 8.7)

REFERENCE(S) :

[1]   M.K. Singal and Asha Rani Singal , A First course in Real Analysis,
        R. Chand and Co, publishers, New Delhi, 2003.
[2]   Shanthi Narayananan, A Couse of Mathematical Analysis,
        S.Chand and Co, 1995.

CC – IX   STATICS

Objectives

1. To provide a basic knowledge of the behavior of various types of forces.

2. To give enough working knowledge to handle practical problems.

UNIT – I :

Force – Resultant of two forces – Three forces related to a triangle – Resultant of several forces – Equilibrium of a particle under three or more forces .

UNIT – II :

Force on a rigid body – Moment of a force – Equivalent system of forces – parallel forces – Varignon's Theorem – Forces along a triangle – Couples – Equilibrium of a rigid body under three coplanar forces – Reduction of a coplanar forces into a force and a couple.

UNIT – III :

Types of forces – Friction – Laws of Friction – Coefficient of Friction, Angle and Cone of Friction – Limiting equilibrium of a particle on a rough inclined plane – Tilting of a body – Simple Problems.

UNIT – IV :

Virtual Work – Principle of Virtual Work – Applied to a body or a system of bodies in equilibrium – Equation of Virtual Work – Simple Problems.

UNIT – V :

String – Equilibrium of Strings under gravity – Common Catenary – Suspension bridge.

TEXT BOOK :

[1]   P. Duraipandiyan, Mechanics (Vector Treatment), S.Chand and Co.,June 1997

UNIT - I   : Chapter 2 and Chapter 3 (section 3.1)
UNIT - II   : Chapter 4 (sections 4.1 , 4.3 to 4.9) and Chapter 5 (section 5.1)
UNIT - III   : Chapter 2 (section 2.1.2) and Chapter 3 (section 3.2) and
              Chapter 5 (section 5.2)
UNIT - IV   : Chapter 8
UNIT - V   : Chapter 9

REFERENCE (S):

[1]   M.K.Venkataraman, Statics, Agasthiyar Publications, 2002.
[2]   A.V . Dharmapadham, Statics, S.Viswanathan Publishers Pvt., Ltd.,
[3]   S.L .Lony ,Elements of Statics and Dynamics, Part – I,. A.I.T. Publishers, 1991.

CC – X   DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS

Objectives :
1. To study differential equations and partial differential equations of first and second order.
2. To study the techniques of finding Laplace transforms and inverse Laplace transforms and real functions and their application in solving ordinary differential equations.

UNIT – I :
Differential Equations – Linear differential equations with Constant coefficients – The operators D and D^{-1} – Particular Integral – Special methods of finding Particular integral – Linear equations with variable coefficients – To find the particular integral – Special method of evaluating the particular integral when x is of the form x ^{m}

UNIT – II :
Exact Differential Equations – Conditions of integrability of Mdx + Ndy = 0 – particular rule for solving an Exact Differential Equation – Rules for finding integrating factors – Equations of the first order but of higher degree – Solvable for x, y, dy/dx – Clairaut's form – Equations that do not contain x explicitly – Equations that do not contain y explicitly – Equations Homogeneous in x and y.

UNIT – III :
Partial Differential Equations – Derivation of partial Differential Equations by elimination of constants, arbitrary functions – Different Integrals of P.D.E – Solutions of P.D.E. in some simple cases – Standard types of first order equations – Standard I,II,III,IV – Equations reducible to the standard forms – Lagrange's equation.

UNIT – IV :
The Laplace Transforms – Sufficient conditions for the existence of the Laplace Transforms – Laplace Transforms of periodic functions – General Theorems – Evaluation of certain integrals using   Laplace Transforms.

UNIT – V :
The Inverse transforms – Inverse transforms of functions – Method of partial fractions – Application of Laplace Transforms to solve ordinary differential equations with constants coefficients.

TEST BOOK :
[1]   S. Narayanan and T.K. Manickavasagam Pillay, Calculus volume –III, S.Viswanathan Pvt., Ltd., 1999.

UNIT - I   :   Chapter 2 (sections 1 , 1.2 , 2 , 3 , 4 , 8 , 8.1 , 8.2 , 8.3)
UNIT - II   :   Chapter 1 (sections 3.1 to 3.3 , 4,5 , 5.1 to 5.5 , 6.1, 7.1 to 7.3)
UNIT - III   :   Chapter 4 (sections 1 , 2 , 2.1 , 2.2 , 3 , 4 , 5 , 5.1 to 5.5 , 6)
UNIT - IV   :   Chapter 5 (sections 1, 1.1, 1.2 , 2 , 3 , 4 , 5)
UNIT - V   :   Chapter 5 (sections 6 , 7 , 8)

REFERENCE (S):

[1]   M.K.Venkataraman, Engineering Mathematics, S.V. Publications, 1985, Revised Edition.
[2]   Arumugam and Isaac, Differential Equations and Applications, New Gamma Publishing House, 2003.

CC – XI   COMPLEX ANALYSIS

Objectives:
1. To introduce the theory of complex variable which is different from analysis of real variable.
2. To learn the properties of complex valued function defined on the set of Complex numbers.
3. To introduce the concept of complex integration and its properties.

UNIT – I :
Functions of a complex variable – Limits – Theorems on Limits – Continuous functions – Differentiability – Cauchy – Riemann equations – Analytic functions – Harmonic functions.

UNIT – II :
Elementary transformations – Bilinear transformations – Cross radio – Fixed points of Bilinear transformations – Some special bilinear transformations.

UNIT – III :
Complex integration – Definite integral – Cauchy's theorem – Cauchy's integral formula – Higher derivatives.

UNIT – IV :
Series expansions – Taylor's series – Laurent's series – Zeros of analytical functions – Singularities.

UNIT – V :
Residues – Cauchy's Residue theorem – Evaluation of definite integrals.

TEXT BOOK:

[1]   S.Arumugam, A.Thangapandi Isaac and A.Somasundaram, Complex Analysis, New Scitech publications (India) Pvt.Ltd. November 2003.

UNIT - I   :   Chapter 2 (sections 2.1 to 2.8)
UNIT - II   :   Chapter 3 (sections 3.1 to 3.5)
UNIT – III   :   Chapter 6 (sections 6.1 to 6.4)
UNIT - IV   :   Chapter 7 (sections 7.1 to 7.4)
UNIT - V   :   Chapter 8 (sections 8.1 to 8.3)

REFERENCE(S)
[1]   P.P.Gupta – Kedarnath and Ramnath, Complex Variables, Meerut-Delhi.

[2]   J.N.Sharma, Functions of a Complex Variable, Krishna Prakasan Media(p) Ltd. 13th Edition, 1996-97.

[3]   T.k. Manickavachagam Pillai, Complex Analysis, S.Viswanathan Publishers pvt. Ltd.1994.

CC – XII   VECTOR CALCULUS, FOURIER SERIES AND MATRICES.

Objectives

1. To study the application of derivatives of vectors.
2. To study the line integral, surface integral and volume integral and their applications.
3. To express periodic functions as a Fourier series.

UNIT – I :

 Vector differentiation – Velocity and acceleration vectors – Vector and scalar fields – Gradient of a vector – Unit normal – Directional derivative – Divergence and curl of a vector – Solenoidal and Irrotational vectors – Laplacian double operators – Simple problems.

UNIT – II :

 Vector Integration – Tangential line integral – Conservative force field – Scalar potential – Work done by a force – Normal surface integral – Volume integral – Simple problems.

UNIT – III :

 Gauss Divergence theorem – Stoke's theorem – Green's theorem – Simple problems and verification of the theorems for simple problems. (statement only)

UNIT – IV :

 Fourier series – Definition – Fourier series expansion of periodic functions with period 2π and period 2a – Use of Odd and even functions in Fourier Series.

UNIT – V:

 Rank of a matrix – Consistency – Eigen values, Eigen vectors – Cayley Hamilton's theorem (statement only) – Symmetric, skew symmetric ,Orthogonal, Hermitian, skew Hermitian and Unitary Matrices – Simple problems only.

TEXT BOOK(S):
[1]   K.Viswanathan and S.Selvaraj, Vector Analysis,
        Emerald Publishers Reprint 1999.
[2]   S.Narayanan, T.K. Manickavasagam pillai, Calculus Volume –III,
        S.Viswanathan Pvt. Limited and Vijay Nicole Imprints Pvt Ltd, 2004.
[3]   S.Arumugam and A. Thangapandi Isaac, Modern Algebra,
        New Gamma publishing House, 2000.
UNIT - I   :Chapter1(section1)andChapter2(sections2.1to2.2.5,2.3to2.5.1)of [1]
UNIT - II   :Chapter 3 (sections 3.1 to 3.7) of [1]
UNIT - III   :Chapter 4 (sections 4.1 to 4.5.1) of [1]
UNIT - IV   :Chapter 6 (sections 1 to 3) of [2]
UNIT - V   :Chapter 7 (sections 7.2 , 7.5 , 7.6 , 7.7) of [3]
REFERENCE :
[1]   M.L Khanna, Vector Calculus, Jai Prakash Nath and co.,

CC – XIII DYNAMICS

Objectives:
1. To expose a basic knowledge about the Coplanar Motion, Newton's Laws of Motion.
2. To provide a knowledge about projectiles, simple Harmonic motion and Conservation of linear momentum.

UNIT – I :

Kinematics : Velocity – Relative Velocity – Acceleration – Coplanar Motion – Components of Velocity and Acceleration – Newton's Laws of Motion.

UNIT – II :

Simple Harmonic motion – Simple Pendulum – Load suspended by an elastic string – Projectile – Maximum height reached, ranges, time of flight – Projectile up/down an inclined plane.

UNIT – III :

Impulsive force – Conservation of linear momentum – Impact of a sphere and a plane – Direct and Oblique Impact of two smooth spheres – Kinetic energy and impulse.

UNIT – IV :

Central Orbit – Central force – Differential equation to a central orbit in polar and p-r coordinates – Given the central orbit to find the law of force – Kepler's Laws of Planetary motion

UNIT – V :

Moment of Inertia of simple bodies – Theorem of Parallel and Perpendicular axes – Motion in two dimension – Equation of motion for two dimensional motion.

TEXT BOOK :

[1]   P. Duraipandiyan, Mechanics, (Vector Treatment), S.Chand and Co., June 1997 Edition.

UNIT - I   :Chapter 1 and Chapter 2 (section 2.1.1)
UNIT - II   :Chapter 12 (sections12.1 to12.3),Chapter15(section 15.6)and Chapter 13
UNIT - III   :Chapter 14
UNIT – IV   :Chapter 16
UNIT – V   :Chapter 17 and Chapter 18

REFERENCES

[1]   M.K. Venkataraman, Dynamics, Agasthiar Book Depot, 1990.
[2]   A.V Dharmapadam, Dynamics, S. Viswanathan Publishers, 1981.