



SRI KANYAKA PARAMESWARI ARTS & SCIENCE COLLEGE FOR WOMEN

(Managed by SKPD & Charities)

**“Linguistic (Telugu) Minority Institution
Conferred by the Government of Tamil Nadu”**

**Affiliated to University of Madras
No. 1, Audiappa Street, Chennai - 600 001.**



DEPARTMENT OF MATHEMATICS

PROGRAMME OUTCOMES (PO):

- **PO 1:** To provide a deep knowledge in all disciplines of mathematics and motivate them to pursue higher studies, research and face competitive exams with confidence.
- **PO 2:** To provide students adequate knowledge to identify, formulate and solve real life problems using advanced tools in Mathematics.
- **PO 3:** To develop the power of reasoning, critical and logical thinking and to enhance arithmetic and numerical abilities .

PROGRAMME SPECIFIC OUTCOMES (PSO):

- **PSO1:** Students understand and acquire a fair knowledge in algebra, trigonometry, analytical geometry, differential and Integral calculus, differential equations and Numerical analysis.
- **PSO2:** Enable the students to enhance their knowledge in Transform Techniques, Mathematical statistics, Discrete mathematics, Graph theory and Operations Research.
- **PSO3:** Facilitate the students to have a thorough knowledge in Dynamics, Statics, Algebraic structures and Linear Algebra, Real and Complex Analysis.
- **PSO4:** To develop the skills in analyzing and interpreting data, enhance computing skills using C-programming and to formulate and solve problems.

SYLLABUS

SUBJECT NAME: ALGEBRA

CORE PAPER- I

Inst. Hours: 5

Credits : 4

SUB. CODE: SM21A

YEAR: I

SEMESTER: I

UNIT I

Theory of equations : Polynomial equations with imaginary and irrational roots - Relation between roots and coefficients - Symmetric functions of roots in terms of coefficients.

Chapter 6: Section 9 to 12.

UNIT II

Reciprocal equations – Standard form -Increase or decrease the roots of the given equation -Removal of terms
Approximate solutions of roots of polynomials by Horner's method.

Chapter 6: Section 16,16.1,16.2,17,30

UNIT III

Summation of Series : Binomial -Exponential - Logarithmic series (Theorems without proof):

Chapter 3: Section 10, Chapter 4: Section 3, 3.1, 3.5, 3.6, 3.7 (omit 3.4).

UNIT IV

Symmetric - Skew Symmetric – Hermitian - Skew Hermitian - Orthogonal Matrices - Eigen values and Eigen vectors - Similar matrices - Cayley - Hamilton Theorem.

Chapter 2: Section 6.1 to 6.3, 9.1, 9.2, 16, 16.1, 16.2, 16.3.

UNIT V

Prime number and Composite number - divisors of a given number N- Euler's function (without proof)

Integral part of a real number - congruences..

Chapter 5: Section 1 to 13.

Contents and treatment as in

1. Algebra, Volume I by T. K. ManicavachagamPillay,T.Natarajan, K.S.Ganapathy, Viswanathan Publication 2007 - Unit – 1 and 2.
2. Algebra, Volume II by T. K. ManicavachagomPillay ,T.Natarajan ,K.S.Ganapathy, Viswanathan Publication 2008 - Unit – 3, 4 and 5.

Reference:-

1. Algebra by S. Arumugam (New Gama publishing house, Palayamkottai) .
2. Algebra and Trigonometry, Volume I and II by P.R.Vittal, V.Malini (Margham Publishers).

e-Resources:

1. <http://mathworld.wolfram.com>
2. <http://www.themathpage.com/>

COURSE OUTCOME

CO1: Evaluate the roots of the polynomial equations.

CO2: Solving Problems of reciprocal equations. and Solve equations by increasing or decreasing the roots.

CO3: Obtain the summation of series.

CO4: Learn the types of matrices, matrix using Eigen values, Eigen vectors and solve problems based on Cayley Hamilton theorem

CO5: Understand the concepts of Number Theory and Euler function

SKPDC

SUBJECT NAME: DIFFERENTIAL CALCULUS

CORE PAPER- II

Inst. Hours: 4

Credits : 4

SUB. CODE: SM21B

YEAR: I

SEMESTER: I

UNIT I

Successive differentiation - n^{th} derivative- standard results – Trigonometrical transformation – formation of equations using derivatives - Leibnitz's theorem and its applications.

Chapter 3 section 1.1 to 1.6, 2.1 and 2.2

UNIT II

Total differential of a function – special cases – implicit functions - partial derivatives of a function of two functions - Maxima and Minima of functions of two variables- Lagrange's method of undetermined multipliers.

Chapter 8 : Section 1.3 to 1.5 and 1.7, Section 4, 4.1 and 5.

UNIT III

Envelopes – method of finding envelopes – Curvature- circle, radius and centre of curvature- Cartesian formula for radius of curvature – coordinates of the centre of curvature – evolute-and involute - radius of curvature and centre of curvature in polar coordinates – p-r equation

Chapter 10 Section 1.1 to 1.4 and Section 2.1 to 2.7

UNIT IV

Polar coordinates - angle between the radius vector and the tangent – slope of the tangent in the polar coordinates – the angle of intersection of two curves in polar coordinates- polar sub tangent and polar sub normal – the length of arc in polar coordinates.

Chapter 9 Section 4.1 to 4.6

UNIT V

Definition-Asymptotes parallel to the axes – special cases – another method for finding asymptotes - asymptotes by inspection – intersection of a curve with an asymptote.

Chapter 11 - Section 1 to 7.

Content and treatment as in

“Calculus”, Volume - 1 by S. Narayanan and T.K. Manicavachagompillay - S.Viswanathan publishers – 2006

Reference:-

1. Calculus , Dr. P.R. Vittal&Dr. V. Malini, Margham Publications, Chennai.
2. Calculus by Thomas and Fenny, Pearson Publication.
3. Calculus by Stewart
4. Calculus , Dr. P.R. Vittal&Dr. V. Malini, Margham Publications, Chennai.

e-Resources:

1. <http://www.themathpage.com/>
2. <http://mathworld.wolfram.com>
3. <http://www.univie.ac.at/future.media/moe/galerie.html>
4. <http://www.analyzemath.com/calculus>

COURSE OUTCOME

CO1: Learn successive differentiation and Leibnitz's theorem.

CO2: Evaluate maxima and minima of a function of two or more variables.

CO3: Understand the concepts of envelope-evolute-involute-curvature.

CO4: Evaluate polar sub tangents, sub normal and length of arc in polar co ordinates.

CO5: Evaluate asymptotes of a curve.

SKBPC

SUBJECT NAME: CALCULUS OF FINITE DIFFERENCES AND NUMERICAL ANALYSIS-I
ALLIED PAPER- I
Inst. Hours: 9
Credits : 5

SUB. CODE: SM3AB
YEAR: I
SEMESTER: I

UNIT I

Solutions of algebraic and transcendental equations: Bisection method- Iteration method- Regula-falsi method- Newton-Raphson method. - Chapter 1 :Section 1.1 - 1.4.

UNIT II

Solutions of Simultaneous Linear Equations: Gauss-Elimination method, Gauss-Jordan method, Crout's method, Gauss-Seidel method. - Chapter 2 :Section 2.1 - 2.4 , 2.6.

UNIT III

Finite Differences: E operators and relation between them- Differences of a polynomial-Factorial polynomials- inverse operator Δ^{-1} -Summation Series. - Chapter 3 :Section 3.1 to 3.4, 3.6, 3.7.

UNIT IV

Interpolation with Equal Intervals:Newton's Forward and Backward Interpolation formulae- Central Differences Formulae: Gauss-Forward and Backward Formulae- Stirling's Formula and Bessel's Formula- Equidistant terms with one or more missing values.
Chapter 4:Section 4.1- 4.3 (omit 4.1a, 4.4), 4.7 . - Chapter 5 :Section 5.1- 5.6.

UNIT V

Interpolation with Unequal Intervals: Divided Differences - Newton's Divided Differences Formula for Interpolation -Lagrange's Formula for Interpolation-Inverse Interpolation- Lagrange's method- Reversion of Series method. - Chapter 6 :Section 6.1, 6.2, 6.5, 6.7.

Content and Treatment as in

“Calculus of Finite Differences and Numerical Analysis” by P. Kandasamy and K. Thilagavathy, S. Chand and Co Pvt.Ltd.

Reference:

1. “Numerical Analysis “ by B. D. Gupta, Konark Publishing.
2. “Numerical methods in Science and Engineering” by M. K. Venkataraman, National Publishing House, Chennai.

e-Resources:

1. <https://nptel.ac.in>
2. https://www.encyclopediaofmath.org/index.php/Finite-difference_calculus

COURSE OUTCOME

CO1: Solve Algebraic and Transcendental Equations.

CO2: Obtain the solution of simultaneous linear equations.

CO3: Understand the concept of finite differences and summation of series.

CO4: Evaluate interpolation with equal intervals.

CO5: Evaluate interpolation with unequal intervals and reversion of series

SUBJECT NAME: TRIGONOMETRY

CORE PAPER- III

Inst. Hours: 4

Credits : 4

SUB. CODE:SM22A

YEAR: I

SEMESTER: II

UNIT I

Expansions of powers of $\sin\theta$, $\cos\theta$ - Expansions of $\cos^n\theta$, $\sin^n\theta$, $\cos^m\theta\sin^n\theta$ Chapter 2, Section 2.1, 2.1.1, 2.1.2, 2.1.3

UNIT II

Expansions of $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ - Expansions of $\tan(\theta_1+\theta_2 + \dots + \theta_n)$ - Expansions of $\sin x$, $\cos x$, $\tan x$ in terms of x -Sum of roots of trigonometric equations – Formation of equation with trigonometric roots. Chapter 3, Section 3.1 to 3.6

UNIT III

Hyperbolic functions-Relation between circular and hyperbolic functions - Formulas in hyperbolic functions – Inverse hyperbolic functions Chapter 4, Section 4.1 to 4.7 .

UNIT IV

Inverse function of exponential functions – Values of $\text{Log}(u+iv)$ - Complex index. Chapter 5, Section 5.1 to 5.3

UNIT V

Sums of Trigonometric series – Applications of binomial, exponential, logarithmic and Gregory's series - Difference method. Chapter 6, Section 6.1 to 6.6.3

Content and treatment as in

Trigonometry by P. Durairandian and Kayalal Pachaiyappa, Muhil Publishers.

Reference:-

1. Trigonometry, Calculus , Dr. P.R. Vittal , Margham Publications, Chennai.
2. Trigonometry by T.K. Manickavachagam Pillay.S.Viswanathan (Printers and Publishers) Pvt.Ltd.

e-Resources:

1. <http://mathworld.wolfram.com>
2. <http://ocw.mit.edu/courses/mathematics/>

COURSE OUTCOME

CO1: Evaluate the expansions of trigonometric functions.

CO2: Obtain the sum of roots of trigonometric equations and form the equations with Trigonometric roots.

CO3: Understand the concepts of circular, hyperbolic and inverse hyperbolic functions.

CO4: Evaluate the Logarithm of complex numbers.

CO5: Obtain the summation of trigonometric series.

SUBJECT NAME: INTEGRAL CALCULUS AND VECTOR ANALYSIS

CORE PAPER-IV

Inst. Hours: 5

Credits : 4

SUB. CODE: SM22B

YEAR: I

SEMESTER: II

UNIT I

Reduction Formulae - Types

$$\int x^n e^{ax} dx, \int x^n \cos ax dx, \int x^n \sin ax dx, \int \cos^n x dx, \\ \int \sin^n x dx, \int \sin^m x \cos^n x dx, \int \tan^n x dx, \int \cot^n x dx, \int \sec^n x dx, \int \operatorname{cosec}^n x dx, \int x^n (\log x)^m dx.$$

Bernoulli's formula.

Chapter – 1: Section 13, 13.1 to 13.10, 14, 15.1

UNIT II

Multiple Integrals - definition of the double integrals - evaluation of the double integrals - double integrals in polar coordinates - triple integrals - applications of multiple integrals - volumes of solids of revolution - areas of curved surfaces - change of variables -Jacobians .

Chapter-5: Section 1, 2.1, 2.2, 3.1, 4, 6.1, 6.2, 6.3, 7

Chapter-6: Section 1.1, 1.2, 2.1 to 2.4.

UNIT III

Beta and Gamma functions - indefinite integral - definitions - recurrence formula of Γ functions - properties of β -functions -relation between β and Γ functions.

Chapter – 7: Section 1.1 to 1.4, 2.1 , 2.3, 3, 4, 5.

UNIT IV

Introduction - directional derivative – Gradient - divergence - curl - Laplacian Differential Operator.

Chapter- 2: Section 2.1 - 2.13.

UNIT V

Line, surface and volume integrals - Integral Theorems - Gauss, Greens and Stokes (Without proof) – Problems.

Chapter 3 Sections 3.1 to 3.6 and Chapter 4 Sections 4.1 to 4.5.

Content and treatment as in

1. “Calculus”, Vol- II by S. Narayanan and T.K. Manicavachagampillay - S. Viswanathanpublishers– 2007 for Unit 1 , Unit 2 , Unit 3.
2. “Vector Analysis” by P.Duraipandian and KayalalPachaiyappa, S.ChandFor Unit 4, Unit 5.

Reference Books:

1. Integral Calculus and differential equations : Dipak Chatterjee (TATA McGraw Hill Publishing companyLtd.).
2. Vector Algebra and Analysis by Narayanan and T.K.Manickvachagam Pillay S .Viswanathan Publishers.
3. Vector Analysis: Murray Spiegel (Schaum Publishing Company, NewYork).

e-Resources:

1. <http://mathworld.wolfram.com>.
2. <http://www.sosmath.com>.

COURSE OUTCOME

CO1: Evaluate and apply Reduction and Bernoulli's formula in Integration.

CO2: Understand concepts in Multiple Integrals and calculate area and volume using multiple integrals.

CO3: Understand the concepts of Beta and Gamma functions and their properties.

CO4: Learn vector differential operators and concepts in Solenoidal and irrotational vectors.

CO5: Verify Gauss, Stokes and Greens theorem using vector integration.

SKPDC

SUBJECT NAME : CALCULUS OF FINITE DIFFERENCES AND NUMERICAL ANALYSIS-II
ALLIED PAPER- II

SUB. CODE: SM3AF

Inst. Hours: 9

YEAR: I

Credits : 5

SEMESTER: II

UNIT I

Numerical Differentiation: Derivatives using Newton's forward and backward difference formulae- Derivatives using Stirling's formula- Derivatives using divided difference formula- Maxima and Minima using the above formulae.

Chapter 7 :Section 7.1- 7.4, 7.6.

UNIT II

Numerical Integration: General Quadrature formula- Trapezoidal rule-Simpson's one-third rule- Simpson's three-eighth rule- Weddle's rule- Euler-Maclaurin Summation formula- Stirling's formula for $n!$. - Chapter 7 :Section 7.7- 7.9, 7.13- 7.15.

UNIT III

Difference equations:Linear homogenous and nonhomogenous difference equation with constant coefficients- particular integrals for $a^x, x^m, \sin kx$ and $\cos kx$.

Chapter 8 :Section 8.1- 8.4, 8.6

UNIT IV

Numerical solution of Ordinary Differential Equations (I order only):

Taylor's series method- Picard's method- Euler's method- Modified Euler's method. Chapter 9: Section 9.5-9.7, 9.9.

UNIT V

Numerical solution of Ordinary Differential Equations (I order only):

Runge-kuttamethod(fourth order only)- Predictor-Corrector method- Milne's method - Adams-Bashforth method.

Chapter 9 : Section 9.10 - 9.14.

Content and Treatment as in

“Calculus of Finite Differences and Numerical Analysis” by P. Kandasamy and K. Thilagavathy, S. Chand and Co. Pvt.Ltd.

Reference:

- 1) “Numerical Analysis “ by B. D. Gupta, Konark Publishing.
- 2) “Numerical methods in Science and Engineering” by M. K. Venkataraman, National Publishing House, Chennai.

e-Resources:

1. <https://nptel.ac.in>
2. https://www.encyclopediaofmath.org/index.php/Finite-difference_calculus

COURSE OUTCOME

CO1: Calculate derivatives of a function and its maxima and minima using Newton's and Stirling's method.

CO2: Evaluate the integrals of a function using Trapezoidal, Simpson's, Weddle's rule.

CO3: Solve difference equation.

CO4: Obtain the numerical solution of ordinary difference equation using Taylor's, Picard's and Euler's method.

CO5: Obtain the numerical solution of ordinary difference equation using Range-Kutta, Milnes and Adams-Bashforth's Predictor- Corrector method.

SUBJECT NAME: ANALYTICAL GEOMETRY

CORE PAPER- V

Inst. Hours: 5

Credits : 4

SUB. CODE:

YEAR: II

SEMESTER: III

UNIT I

Chord of contact - polar and pole - conjugate points and conjugate lines - chord with (x_1, y_1) as its midpoint - diameters - conjugate diameters of an ellipse - semi diameters - conjugate diameters of hyperbola

Chapter-7: Sections 7.1 to 7.3, Chapter – 8 Sections 8.1 to 8.5

UNIT II

Polar coordinates, general polar equation of straight line - polar equation of a circle on A_1A_2 as diameter, equation of a straight line, circle, conic – equation of chord, tangent, normal. Equations of the asymptotes of a hyperbola.

Chapter -10: Sections 10.1 to 10.8

UNIT III

Introduction - System of Planes - Length of the perpendicular - orthogonal projection.

Chapter 2: Section 2.1 to 2.10

UNIT IV

Representation of line - angle between a line and a plane - co-planar lines - shortest distance 2 skew lines - Length of the perpendicular - intersection of three planes.

Chapter -3 Section 3.1 to 3.8

UNIT V

Equation of a sphere - general equation - section of a sphere by a plane - Equation of the circle - tangent plane - angle of intersection of two spheres – condition for the orthogonality - radical plane.

Chapter-6: Sections 6.1 to 6.8

Contents and treatment as in

1. Analytical Geometry of 2D by P. DuraiPandian -Muhilpublishers for Unit-1 and 2
2. Analytical Solid Geometry of 3D by Shanthi Narayan and Dr.P.K. Mittal for Unit - 3 to 5

Reference Books:

1. Analytical Geometry of Two Dimensions by T. K. Manikavachakam Pillai and S. Narayanan.
2. Analytical Geometry of Three Dimensions by T. K. Manikavachakam Pillai and S. Narayanan.

e-Resources:

1. <http://mathworld.wolfram.com>
2. <http://www.univie.ac.at/future.media/moe/galerie.html>

COURSE OUTCOME

CO1: Learn the concepts of conjugate points, lines, and diameters of conics.

CO2: Calculate concyclic points of a conic and asymptotes of hyperbola.

CO3: Understand and Find the equation of the planes.

CO4: Evaluate co-planar lines and shortest distance of skew lines.

CO5: Obtain the equations of the sphere, radical plane and orthogonal spheres.

SUBJECT NAME: DIFFERENTIAL EQUATIONS

CORE PAPER- VI

Inst. Hours: 4

Credits : 4

SUB. CODE:

YEAR: II

SEMESTER: III

UNIT I

Ordinary Differential Equations: Variable separable-Homogeneous Equation-Non-Homogeneous Equations of first degree in x and y-Linear Equation-Bernoulli's Equation-Exact differential equations.

Chapter 2: Section 1 to 6.

UNIT II

Equation of first order but not of higher degree: Equation solvable for dy/dx - Equation solvable for y Equation solvable for x- Clairauts form-Linear Equations with constant coefficients-Particular integrals

$e^{ax}, \sin ax, \cos ax, x^m, Ve^{ax}$ where V is $\sin ax$ or $\cos ax$ or x^m

Chapter 4: Section 1, 2.1, 2.2, 3.1.

Chapter 5: Section 4.

UNIT III

Simultaneous linear differential equations- Linear Equations of the Second Order -Complete solution in terms of a known integrals- Reduction to the Normal form- Change of the Independent Variable - Method of Variation of Parameters.

Chapter 6: Section- 6

Chapter 8:Section- 1,2,3,4.

UNIT IV

Partial differential equation: Formation of PDE by Eliminating arbitrary constants and arbitrary functions-complete integral-singular integral-General integral- Lagrange's Linear Equations $Pp+Qq=R$.

Chapter 12: Section- 1, 2, 3.1, 3.2, 4.

UNIT V

Special methods - Standard forms - Charpit's Methods - Related problems

Chapter 12: Section-5.1, 5.2, 5.3, 5.4, 6. 13

Contents and treatment as in "Differential Equations and its applications", by S.Narayanan, T.K.Manikavachagam Pillay — S.Viswanathan (Printers and Publishers) Pvt. Ltd(2006).

Reference:

1. Mathematics for B.Sc-Branch-I Volume –III by P.Kandasamy ,K.Thilagavathy S.Chand Publications.
2. Differential equations with applications and historical notes by George F.Simmons, 2 ndEd,TataMcgraw Hill Publications .
3. Differential Equations by ShepleyL.Ross, 3 rdEd ,JohnWiely and sons 1984.
4. Differential Equations by N.P.Bali,Laxmi Publications Ltd,New Delhi-2004.
5. Ordinary and Partial differential Equation by Dr.M.D.Raisinghaniania ,S.Chand.

e-Resources:

1. <http://mathworld.wolfram.com>
2. http://www.anlyzemath.com/calculus/Differential_Equations/applications.html

COURSE OUTCOME:

CO1: Learn to solve ODE - homogeneous, non-homogeneous, exact and Bernouli's equations.

CO2: Learn to solve ODE solvable for x and y.

CO3: Understand and solve homogeneous linear ordinary differential equations

CO4: Formulate PDE by eliminating arbitrary constants/functions & solve PDE.

CO5: Solve PDE by standard types and Charpit's method.

SUBJECT NAME: MATHEMATICAL STATISTICS I

ALLIED PAPER- III

Inst. Hours: 9

Credits : 5

SUB. CODE:

YEAR: II

SEMESTER: III

UNIT I

Concept of sample space- Events- Definition of Probability (Classical,Statistical& Axiomatic)- Addition and Multiplication laws of Probability- Independence- Conditional Probability- Baye's theorem – Simple Problems.

UNIT II

Random Variables (Discrete and Continuous) Distribution function- Expected values and Moments Moment generating function – Probability generating function- Examples.

UNIT III

Characteristic function- Uniqueness and Inversion theorems (Statements and applications only)- Cumulants - Chebychev's Inequality – Simple Problems.

UNIT IV

Concepts of bivariate distributions- Correlation and Regression- Linear Prediction- Rank Correlation coefficient-Concepts of partial and multiple correlation coefficients- Simple problems.

UNIT V

Standard Distributions – Binomial- Poisson- Normal- Uniform distributions- Geometric- ExponentialGamma - Beta distributions- Inter relationship between distributions. 21

Reference:

- 1.S.C.Gupta&V.K.Kapoor : Elements of Mathematical Statistics, Sultan Chand & Sons, NewDelhi.
- 2.Hogg R.V. & Craig A.T. (1988) : Introduction to Mathematical Statistics, McMillan.
3. Mood A.M. &Graybill F.A. & Boes D.G. (1974): Introduction to theory of Statistics, McGraw Hill.
- 4.Snedecor G.W. & Cochran W.G(1967) : Statistical Methods, Oxford and IBH.

e-Resources:

1. <https://nptel.ac.in>
2. <https://www.wikipedia.org>.
3. <http://ebooks.lpude.in/statistics>.

COURSE OUTCOME

CO1: Understand the concepts of Sample space and Probability.

CO2: Describe the concepts of random variable and Moment generating function

CO3: Calculate Characteristic function of random variables.

CO4: Explain the concept of bivariate distribution and solve the problems based on it.

CO5: Learn standard distributions and their inter relationship

SUBJECT NAME: TRANSFORM TECHNIQUES

CORE PAPER- VII

Inst. Hours: 4

Credits : 4

SUB. CODE:

YEAR: II

SEMESTER: IV

UNIT I

The Laplace Transforms-Definitions-Sufficient conditions for the existence of the Laplace transform(without proof)-Laplace transform of periodic functions-some general theorems-evaluation of integrals using Laplace transform-Problems. Chapter 5: Section-1 to 5.

UNIT II

The inverse Laplace Transforms- Applications of Laplace Transforms to ordinary differential equations with constant co-efficients and variable co-efficients, simultaneous equations and equations involving integrals-Problems. Chapter 5: Section-6 to 12.

UNIT III

Fourier series- Expansion of periodic functions of period 2π - Expansion of even and odd functions, Half range Fourier series-Change of intervals –Problems. Chapter 6: Section-1 to 6.

UNIT IV

: Fourier Transform- Infinite Fourier Transform(Complex form) – Properties of Fourier Transform – Fourier cosine and Fourier sine Transform – Properties – Parseval’s identity – Convolution theorem - Problems. Chapter 6: Section-8 to 15.

UNIT V

Z Transforms: Definition of Z-Transform and its properties - Z-Transforms of some basic functions- Examples and simple problems.

Contents and treatment as in

1. “Calculus-Volume III” – S.Narayananand T.K.ManicavachagamPillai. (Ananda Book Depot)
(for Units I to IV)
2. “Engineering Mathematics for Semester III- Third Edition – T.Veerarajan (Tata McGraw-Hill Publishing Company Ltd, New Delhi) (for Unit-V)

Reference:

1. Engineering Mathematics Volume III – P.Kandasamy and others (S.Chand and Co.)
2. Advanced Engineering Mathematics- Stanley Grossman and William R.Devit.
3. Engineering Mathematics III-A. Singaravelu, Meenakshi Agency, Chennai, 2008

e-Resources:

1. <http://mathworld.wolfram.com> .
2. <http://www.sosmath.com>.

COURSE OUTCOME

CO1: Understand & Solve Laplace Transforms of any function.

CO2: understand inverse Laplace Transforms and solve problems in ordinary differential and simultaneous equations

CO3: Explain the concept of periodic function and solve problems in Fourier series

CO4: Evaluate the Fourier transforms and solve problems using properties of Fourier transforms..

CO5: Learn Z transforms and its properties and solve problems using Z transforms

SUBJECT NAME: STATICS

CORE PAPER- VIII

Inst. Hours: 5

Credits : 4

SUB. CODE:

YEAR: II

SEMESTER: IV

UNIT I

Force- Newton's laws of motion - resultant of two forces on a particle- Equilibrium of a particle

Chapter 2 - Section 2.1, 2.2,

Chapter 3 - Section 3.1.

UNIT II

Forces on a rigid body – moment of a force – general motion of a rigid body- equivalent systems of forces – parallel forces – forces along the sides of a triangle – couples

Chapter 4 - Section 4.1 to 4.6.

UNIT III

Resultant of several coplanar forces- equation of the line of action of the resultant- Equilibrium of a rigid body under three coplanar forces – Reduction of coplanar forces into a force and a couple.- problems involving frictional forces

Chapter 4 - Section 4.7 to 4.9,

Chapter 5 - Section 5.1, 5.2.

UNIT IV

Centre of mass – finding mass centre – a hanging body in equilibrium

Chapter 6 - Section 6.1 to 6.3.

UNIT V

Hanging strings - equilibrium of a uniform homogeneous string – suspension bridge

Chapter 9 - Section 9.1, 9.2.

Contents and treatment as in “Mechanics” by P. Duraipandian, LaxmiDuraipandian, MuthamizhJayapragasham, S. Chand and Co limited 2008.

Reference:

1. Dynamics – K. ViswanathaNaik and M. S. Kasi, Emerald Publishers.
2. Dynamics – A. V. Dharmapadam, S. Viswanathan Publishers.
3. Mechanics – Walter Grenier.

e-Resources:

1. <https://www.wikipedia.org/>
2. <https://physics.info>

COURSE OUTCOME

CO1: Understand Newton's laws of motion, resultant of forces and limiting equilibrium.

CO2: Describe the types of forces on a rigid body and calculate moment and couple.

CO3: Calculate the resultant of several forces and solve problems in couples.

CO4: Evaluate the center of mass of a body and identify the mass centre of a hanging body

CO5: Explain and solve problems in hanging strings, virtual work and suspension bridge.

SUBJECT NAME: MATHEMATICAL STATISTICS II

ALLIED PAPER- IV

Inst. Hours: 9

Credits : 5

SUB. CODE:

YEAR: II

SEMESTER: IV

UNIT I

Sampling Theory – Sampling distributions - concept of standard error – sampling distribution based on Normal distribution : t, chi-square and F distribution.

UNIT II

Point estimation - concepts of unbiasedness, consistency, efficiency and sufficiency - Cramer Rao inequality - methods of estimation : Maximum likelihood, moments and minimum chi-square and their properties (Statement only).

UNIT III

Test of Significance- standard error – large sample tests. Exact tests based on Normal, t, chi-square and F distributions with respect to population mean/means, proportion/proportions, variances and correlation coefficient. Test of independence of attributes based on contingency tables – Goodness of fit based on Chi-square.

UNIT IV

Analysis of variance: one way, two-way classification – Concepts and problems, interval estimation – confidence intervals for population mean/means, proportion/proportions and variances based on t, Chi-square and F.

UNIT V

Tests of hypothesis : Type I and Type II errors – power of test – Neyman Pearson Lemma – Likelihood ratio test – Concepts of most powerful test – Statements and results only - Simple problems.

Reference:

1. S.C.Gupta&V.K.Kapoor : Elements of Mathematical Statistics, Sultan Chand & Sons, NewDelhi.
2. Hogg R. V. & Craig A.T. (1988) : Introduction to Mathematical statistics, Mcmillan.
3. Mood A. M &Graybill F. A &Boes D. G (1974) : Introduction to theory of statistics, Mcgraw Hill.
4. Snedecor G.W. & Cochran W.G : Statistical methods, Oxford and IBH.
5. Hoel P. G. (1971) : Introduction to Mathematical Statistics, Wiley.
6. Wilks S. S : Elementary Statistical Analysis, Oxford and IBH.

e-Resources:

1. <https://nptel.ac.in>
2. <https://www.wikipedia.org>.
3. <http://ebooks.lpude.in.statistics>.

COURSE OUTCOME

CO1: Understand sampling distribution and normal distribution and solve problems based on it.

CO2: Describe the consistency, efficiency and sufficiency of estimators.

CO3: Understand how to test the significance of standard error based on contingency tables.

CO4: Evaluate the problems based on analysis of variance.

CO5: Describe the concept of hypothesis testing and solve the problem based on it.

SUBJECT NAME: MATHEMATICAL STATISTICS I&II -PRACTICALS
SUBJECT CODE:

YEAR: II
SEMESTER: IV

1. Construction of Univariate and Bivariate frequency distribution with samples of size not exceeding 200.
2. Diagrammatic and graphical representation on data and frequency distribution.
3. Cumulative frequency distribution – Ogive curves and Lorenz curves.
4. Measures of Location and dispersion (absolute and relative), skewness and Kurtosis.
5. Numerical problem involving derivation of Marginal and Conditional distributions and related measures of moments.
6. Fitting of Binomial, Poisson and Normal distribution and test of goodness of fit.
7. Curve fitting by the method of least squares
 - a) $y = ax + b$
 - b) $y = ax^2 + bx + c$
 - c) $y = ae^{bx}$
 - d) $y = ax^b$
8. Computation of Correlation coefficients and Regression lines for raw and grouped data – Rank correlation coefficient.
9. Asymptotic and exact test of significance with regard to population mean, proportion, variance and coefficient of correlation.
10. Test of independence of attributes based on contingency table.
11. Confidence interval based on normal, t, chi – square statistics.

NOTE: Use of scientific calculator may be permitted for mathematical statistics practical examination. Statistical and Mathematical tables are to be provided to the students at the examination hall.

COURSE OUTCOME

CO1: Understand the concepts in diagrammatic and graphical representation of data and frequency distribution.

CO2: Calculate the Measures of dispersion, skewness and kurtosis.

CO3: Evaluate the fitting of Binomial, Poisson and Normal distributions, and testing the goodness of fit.

CO4: Compute Correlation and Regression lines for raw and grouped data.

CO5: Analyze the test of significance for mean, proportion, variance based on normal, t, chi-square statistics.

SUBJECT NAME: ALGEBRAIC STRUCTURES
SUBJECT CODE: TAM5A

YEAR: III
SEMESTER: V

UNIT I

Introduction to groups, Subgroups, cyclic groups and properties of cyclic groups; Lagrange's Theorem;
A counting principle
Chapter 2: Section 2.4 and 2.5

UNIT II

Normal subgroups and Quotient group; Homomorphism; Automorphism.
Chapter 2: Section 2.6 to 2.8

UNIT III

Cayley's Theorem; Permutation groups.
Chapter 2: Section 2.9 and 2.10

UNIT IV

Definition and examples of ring - Some special classes of rings; homomorphism of rings; Ideals and quotient rings; more ideals and quotient rings
Chapter 3: Section 3.1 to 3.5

UNIT V

The field of quotients of an integral domain; Euclidean Rings; A particular Euclidean ring.
Chapter 3: Section 3.6 to 3.8

Contents and treatments in "Topics in Algebra" – I.N. Herstein, Wiley Eastern Ltd.

Reference Books:

1. Modern Algebra by M.L.Santiago
2. Modern Algebra by S.Arumugam and others, New Gamma publishing House, Palayamkottai.
3. Modern Algebra by Visvanathan Nayak

COURSE OUTCOME

CO1: Understand the concepts of groups, subgroups and cyclic groups.

CO2: Learn theorems in normal subgroups, quotient groups, homomorphism and automorphism.

CO3: Understand the concepts in Cayley's theorem and solve problems in permutation group.

CO4: Learn and solve problems in rings and ideals and quotient rings.

CO5: Learn the field of quotients of an integral domain and concepts in Euclidean rings.

SUBJECT NAME: REAL ANALYSIS- I
SUBJECT CODE: TAM5B

YEAR: III
SEMESTER: V

UNIT I

Sets and elements; Operations on sets; functions; real valued functions; equivalence; countability ; real numbers; least upper bounds.

Chapter 1 Section 1.1 to 1.7

UNIT II

Definition of a sequence and subsequence; limit of a sequence; convergent sequences; divergent sequences; bounded sequences; monotone sequences.

Chapter 2 Section 2.1 to 2.6

UNIT III

Operations on convergent sequences; operations on divergent sequences; limit superior and limit inferior; Cauchy sequences.

Chapter 2 Section 2.7 to 2.10

UNIT IV

Convergence and divergence; series with non-negative numbers; alternating series; conditional convergence and absolute convergence; tests for absolute convergence; series whose terms form a non-increasing sequence; the class I^2

Chapter 3 Section 3.1 to 3.4, 3.6, 3.7 and 3.10

UNIT V

Limit of a function on a real line; Metric spaces; Limit in metric spaces. Function continuous at a point on the real line, reformulation, Function continuous on a metric space.

Chapter 4 Section 4.1 to 4.3, Chapter 5 Section 5.1 -5.3

Contents and Treatment as in

“Methods of Real Analysis”: Richard R.Goldberg (Oxford and IBH publishing Co.)

Reference Books:

1. Principles of Mathematical Analysis by Walter Rudin
2. Mathematical Analysis Tom M Apostol

COURSE OUTCOME

CO1: Learn sets and functions, real valued function, equivalence and countability.

CO2: Describe sequences, sub sequences and their types.

CO3: Explain convergent and divergent sequences, limit superior and inferior, Cauchy sequences.

CO4: Evaluate absolute and conditional convergent of a series.

CO5: Describe metric space and its functions on a real line.

SUBJECT NAME: DYNAMICS
SUBJECT CODE: TAM5C

YEAR: III
SEMESTER: V

UNIT I

Basic units - velocity - acceleration - coplanar motion - rectilinear motion under constant forces - acceleration and retardation - thrust on a plane - motion along a vertical line under gravity - line of quickest descent - motion along an inclined plane - motion of connected particles.

Chapter 1: Sections 1.1 to 1.4, Chapter 10: Sections 10.1 to 10.6

UNIT II

Work, Energy and power - work - conservative field of force - power - Rectilinear motion under varying Force simple harmonic motion(S.H.M.) - S.H.M. along a horizontal line - S.H.M. along a vertical line - motion under gravity in a resisting medium.

Chapter 11: Section 11.1 to 11.3, Chapter 12: Section 12.1 to 12.4

UNIT III

Forces on a projectile - projectile projected on an inclined plane - Enveloping parabola or bounding parabola - impact - impulse force - impact of sphere - impact of two smooth spheres - impact of a smooth sphere on a plane - oblique impact of two smooth spheres.

Chapter 13: Sections 13.1 to 13.3, Chapter 14: Section 14.1, 14.5

UNIT IV

Circular motion - Conical pendulum - motion of a cyclist on a circular path - circular motion on a vertical plane - relative rest in a revolving cone - simple pendulum - central orbits - general orbits - conic as centered orbit.

Chapter 15: Section 15.1 to 15.6, Chapter 16: Section 16.1 to 16.3

UNIT V

Moment of inertia - Two dimensional motion of a rigid body - equations of motion for two dimensional motion - theory of dimensions - definition of dimensions.

Chapter 17: Section 17.1, Chapter 18: Section 18.1, 18.2, Chapter 19: Section 19.1

Contents and treatment as in

“Mechanics” – P. Duraipandian, LaxmiDuraipandian, Muthamizh Jayapragasham, S. Chand and Co limited 2008.

Reference Books:

1. Dynamics- K. ViswanathaNaik and M. S. Kasi, Emerald Publishers.
2. Dynamics- A. V. Dharmapadam, S. Viswanathan Publishers.
3. Mechanics - WalterGrenier.

COURSE OUTCOME

CO1: Understand and solve the motion along the vertical line under gravity, inclined plane and connected particles.

CO2: Explain the concepts of rectilinear motion and simple harmonic motion along horizontal line and vertical line.

CO3: Solve problems relating to forces on a projectile, impact and impulse.

CO4: Learn circular motion, simple & conical pendulum and central orbits.

CO5: Calculate Moment of Inertia for different sections and two dimensional motion of a rigid body.

SKBPC

SUBJECT NAME: DISCRETE MATHEMATICS
SUBJECT CODE: TAM5D

YEAR: III
SEMESTER: V

UNIT I

Set, some basic properties of integers Mathematical induction, divisibility of integers, representation of positive integers.

Chapter 1: Sections 1.1 to 1.5

UNIT II

Boolean algebra, two element Boolean algebra, Disjunctive normal form, Conjunctive normal form.

Chapter 5: Section 5.1 to 5.4

UNIT III

Application, simplification of circuits, designing of switching circuits, Logical Gates and Combinatorial circuits.

Chapter 5: Section 5.5 to 5.6

UNIT IV

Sequence and recurrence relation, Solving recurrence relations by iteration method, Modeling of counting problems by recurrence relations, Linear(difference equations) recurrence relations with constant coefficients, Generating functions, Sum and product of two generating functions, Useful generating functions, Combinatorial problems.

Chapter 6: Section 6.1 to 6.6

UNIT V

Introduction, Walk, Path and cycles, Euler circuit.

Chapter 7: Section 7.1 to 7.3

Contents and treatment as in

Introduction to Discrete Mathematics, 2nd edition, 2002 by
M. K. Sen and B. C. Chakraborty, Books and Allied Private Ltd., Kolkata.

Reference Books:

1. Discrete mathematics for computer scientists and mathematicians by J. L. Merritt, Abraham Kendel and T. P. Baker prentice-hall, India.
2. Discrete mathematics for computer scientists by John Trust-Addison Wesley.
3. Elements of Discrete Mathematics, C. L. Liu, New York McGraw-Hill, 1977.

COURSE OUTCOME

CO1: Learn the basic properties of Mathematical induction.

CO2: Describe Boolean algebra and solve problems on disjunctive and conjunctive normal forms.

CO3: Learn to design switching circuits and logical gates.

CO4: Solve recurrence relation by iteration method and generating functions.

CO5: Describe the concepts of walk, path and cycles and Euler's circuits of a graph.

SUBJECT NAME: Programming Language 'C' With Practical (THEORY)
SUBJECT CODE: TEM5A

YEAR:III
SEMESTER: V

UNIT I

Introduction constants – variables - data types (fundamental and user defined) operators - precedence of operators - library functions - Input, output statements - escape sequences - formatted outputs - storage classes - compiler directives.

Chapter 2: Section 2.1 to 2.8, Chapter- 3: Section 3.1 to 3.7, 3.12, Chapter 4: Section 4.2-4.5

UNIT II

Decision making and branching simple if, if else, nested if, else if ladder and switch statement - conditional operator - go to statement decision making and looping: while, do while and for statement - nested for loops - continue and break statements.

Chapter 5: Section 5.1 to 5.9, Chapter 6: Section 6.1 to 6.5

UNIT III

Arrays: one dimensional and 2 dimensional arrays - declarations - initialization of arrays - operation on strings - string handling functions.

Chapter 7: Section 7.1 to 7.4, Chapter 8: Section 8.1 to 8.8

UNIT IV

Functions: Function definition and declaration - categories of functions – recursion - concept of pointers
Function call by reference - call by value.

Chapter 9: Section 9.1 to 9.13, Chapter 11: Section 11.1 to 11.5

UNIT V

Files definition operations on files - file operation functions.

Chapter 12: Section 12.1 to 12.

Contents and treatment as in

Programming in ANSI C 2nd edition by E. Balagurusamy, TATA-Mcgraw Hill Publishing Company.

Reference Books:

1. Venugopal, programming in C.
2. Gottfried, B.S : programming with C, Schaum's outline series, TMH 2001.
3. YashvantKanitkar, let us 'C' BPB Publications.

COURSE OUTCOME

CO1: Learn the basics of programming language in C.

CO2: Distinguish between the loops.

CO3: Describe the concepts of arrays and string handling functions.

CO4: Explain the concepts of functions.

CO5: Understand the file concepts.

SUBJECT NAME: Programming Language 'C' With Practical
SUBJECT CODE: TEM51

YEAR:III
SEMESTER: V

PRACTICALS:

Writing 'C' programs for the following:

1. To convert centigrade to Fahrenheit.
2. To find the area, circumference of a circle.
3. To convert days into months and days.
4. To solve a quadratic equation.
5. To find sum of n numbers.
6. To find the largest and smallest numbers.
7. To generate Pascal's triangle, Floyd's triangle.
8. To find the trace of a matrix.
9. To add and subtract two matrices.
10. To multiply two matrices.
11. To generate Fibonacci series using functions.
12. To compute factorial of a given number using functions.
13. To add complex numbers using functions.
14. To concatenate two strings using string handling functions.
15. To check whether the given string is a palindrome or not using string handling functions.

COURSE OUTCOME

CO1: Describe basic mathematical function.

CO2: Solve the quadratic equation and find largest and smallest number.

CO3: Solve the concepts of Pascal's, Floyd's and find the trace of the matrix.

CO4: Understand the basics of matrices and Fibonacci using functions.

CO5: Understand concepts of functions and string handling functions.

SUBJECT NAME: LINEAR ALGEBRA
SUBJECT CODE: TAM6A

YEAR: III
SEMESTER: VI

UNIT I

Vector spaces, Elementary basic concepts; linear independence and bases

Chapter 4 Section 4.1 and 4.2

UNIT II

Dual spaces

Chapter 4 Section 4.3

UNIT III

Inner product spaces

Chapter 4 Section 4.4

UNIT IV

Algebra of linear transformation; characteristic roots.

Chapter 6 Section 6.1 and 6.2

UNIT V

Matrices; canonical forms; triangular forms.

Chapter 6 Sections 6.3 and 6.4

Treatment and contents as in

“Topics in Algebra”- I.N. Herstein - Wiley Eastern Ltd.

Reference Books:

1. University Algebra –N.S.Gopalakrishnan -New Age International Publication, Wiley Eastern Ltd.
2. First course in Algebra – Johan B. Fraleigh, Addison Wesley.
3. Text Book of Algebra - R. Balakrishna and N.Ramabadran, Vikas publishing Co,
4. Algebra – S.Arumugam, New Gamma publishing house, Palayamkottai.

COURSE OUTCOME

CO1: Understand the concepts of vector space, linear independence and basis.

CO2: Explain the concepts of dual spaces.

CO3: Describe the concepts of inner product spaces.

CO4: Explain the concepts of linear transformation and characteristics roots.

CO5: Learn the concepts of matrices, canonical & triangular forms.

SUBJECT NAME: REAL ANALYSIS- II
SUBJECT CODE: TAM6B

YEAR: III
SEMESTER: VI

UNIT I

Open sets; closed sets; Discontinuous function of R^1 . More about open sets; Connected sets:

Chapter 5 section 5.4 to 5.6

Chapter 6 Section 6.1 and 6.2

UNIT II

Bounded sets and totally bounded sets: Complete metric spaces; compact metric spaces, continuous functions on a compact metric space, continuity of inverse functions, uniform continuity.

Chapter 6 Section 6.3 to 6.8

UNIT III

Sets of measure zero, definition of the Riemann integral, existence of the Riemann integral; properties of Riemann integral

Chapter 7 Section 7.1 to 7.4

UNIT IV

Derivatives: Rolle 's Theorem, Law of mean, Fundamental theorems of calculus.

Chapter 7 Section 7.5 to 7.8

UNIT V

Taylor's theorem; Pointwise convergence of sequences of functions, uniform convergence of sequences of functions

Chapter 8- Section 8.5, Chapter 9 - Section 9.1 and 9.2

Contents and Treatment as in

"Methods of Real Analysis" – Richard R. Goldberg (Oxford and IBH Publishing Co.)

Reference Books:

1. Principles of Mathematical Analysis by Walter Rudin
2. Mathematical Analysis Tom M Apostol

COURSE OUTCOME

CO1: Understand the concepts of open, closed & connected sets.

CO2: Explain the concepts of boundedness, completeness and compactness of metric space.

CO3: Describe the concepts of sets of measure zero, Riemann Integral and its existence.

CO4: Explain and solve the problems on Rolle's theorem, law of Mean and fundamental theorems of calculus.

CO5: Understand Taylor's theorem and evaluate pointwise and uniform convergence of sequences.

SUBJECT NAME: COMPLEX ANALYSIS
SUBJECT CODE: TAM6C

YEAR: III
SEMESTER: VI

UNIT I

Functions of a complex variable - mappings, limits - theorems on limits continuity, derivatives, differentiation formulae - Cauchy-Riemann equations - sufficient conditions for differentiability - Cauchy-Riemann equations in polar form - analytic functions - harmonic function.

Chapter 2: Section 2.9 to 2.12, 2.14 to 2.20 and 2.22

UNIT II

Linear functions - The transformation $w=1/z$ - linear fractional transformations - an implicit form - exponential and logarithmic transformations - transformation $w=\sin z$ - Preservation of angles

Chapter 8: Section 8.68 to 8.71 and 8.73, 8.74, Chapter 9: Section 9.79

UNIT III

Complex valued functions – contours - contour integrals - anti derivatives - Cauchy-Goursat theorem - Cauchy integral formula - derivatives of analytic function - Liouville's theorem and fundamental theorem of algebra - maximum moduli of functions.

Chapter 4: Section 4.30 to 4.42

UNIT IV

Convergence of sequence and series - Taylor's series - Laurent's series - zeroes of analytic functions

Chapter-5: Section 5.43 to 5.47

UNIT V

Residues - Residue theorems - three types of isolated singular points - Residues at poles - Zeroes and poles of order 'm' - Evaluation of improper integrals - Improper integrals involving sines and cosines - definite integrals involving sines and cosines - Argument principle and Rouché's theorem.

Chapter 6: Section 6.53 to 6.57 and Chapter 7 Section 7.60 to 7.65

Contents and treatment as in

Complex variables and applications (sixth edition) by James Ward Brown and Ruel V. Churchill, McGrawhill Inc.

Reference Books:

1. Theory and problems of Complex variables – Murray R. Spiegel, Schaum outline series.
2. Complex Analysis-P.Duraipandian.
3. Introduction to Complex analysis - S. Ponnuswamy, Narosa Publishers 199

COURSE OUTCOME

CO1: Understand and evaluate analytic functions of complex variable.

CO2: Solve problems on different transformations of linear functions.

CO3: Learn theorems on complex valued functions and evaluate problems based on Cauchy integral formula.

CO4: Describe convergence of Taylor's series and Laurent's series.

CO5: Calculate residues and improper integrals.

SUBJECT NAME: GRAPH THEORY
SUBJECT CODE: TEM6B

YEAR: III
SEMESTER: VI

UNIT I

Graphs, sub graphs, degree of a vertex , isomorphism of graphs, independent sets and coverings , intersection graphs and line graphs, adjacency and incidence matrices, operations on graphs.

Chapter 2: Section 2.0 - 2.9

UNIT II

Degree sequences and graphic sequences – simple problems, Connectedness, walks, trails, paths, components, bridge , block, connectivity – simple problems.

Chapter 3: Section 3.0-3.2, Chapter 4: Section 4.0 -4.4

UNIT III

Eulerian and Hamiltonian graphs

Chapter 5: Section 5.0-5.2

UNIT IV

Trees – simple problems.

Planarity: Definition and properties, Characterization of planar graphs.

Chapter 6: Section 6.0-6.2, Chapter 8: Section 8.0-8.2

UNIT V

Diagraphs and matrices, tournaments, some application connector problem

Chapter 10: Sections 10.0-10.4, Chapter 11: Sections 11.0-11.1

Content and treatment as in

Invitation to Graph theory by S.Arumugam and S.Ramachandran, New Gamma publishing House, Palayamkottai

Reference Books:

1. A first book at graph theory by John Clark and Derek Allan Holton, Allied Publishers
2. Graph Theory by S.Kumaravelu and SusheelaKumaravelu, Publishers authors C/o 182 Chidambara Nagar, Nagarkoil

COURSE OUTCOME

CO1: Learn the concepts of operations on graphs.

CO2: Identify the connectedness, Walks, trails, paths, components, bridge and block in graphs.

CO3: Identify Eulerian and Hamiltonian graphs.

CO4: Learn the concepts of planarity of graphs and solve problems on trees.

CO5: Explain the concepts of the digraphs, matrices and tournaments of a graph.

SUBJECT NAME: OPERATIONS RESEARCH
SUBJECT CODE: TEM6C

YEAR: III
SEMESTER: VI

UNIT I

Linear programming: Formulation – graphical solution. Simplex method, Big-M method, Duality – primal – dual relation.

Chapter 6: Section 6.1-6.13, 6.20-6.31

UNIT II

Transportation problem: Mathematical Formulation. Basic Feasible solution. North West Corner rule. Least Cost Method, Vogel's approximation. Optimal solution. Unbalanced Transportation problems. Degeneracy in Transportation Problems.

Assignment problem: Mathematical Formulation. Comparison with Transportation Model. Hungarian Method. Unbalanced Assignment problems

Chapter 9: Section 9.1-9.12, Chapter 8: Sections 8.1-8.5

UNIT III

Sequencing problem: n jobs on 2 machines – n jobs on 3 machines – two jobs on m machines – n jobs on m machines. Game theory: Two – person zero sum game with saddle point – without saddle point - dominance - solving $2 \times n$ or $m \times 2$ game by graphical method.

Chapter 10: Sections 10.1-10.6, Chapter 12: Section 12.1-12.15

UNIT IV

Queuing theory: Basic concepts. Steady state analysis of M/M/1 and M/M/S models with finite and infinite capacities.

Chapter 5: Section 5.1 – 5.186

UNIT V

Network: Project Network diagram-CPM and PERT computations.(Crashing excluded)

Chapter 13: Sections 13.1-13.10

Content and treatment as in

Operations Research by R.K.Gupta, Krishna Prakashan
India (p), Meerut Publications.

Reference Books:

1. Gauss S. I. Linear programming, McGraw-Hill Book Company.
2. Gupta P. K. and Hira D. S., problems in Operation research, S.Chand & Co.
3. Kami Swaroop, Gupta P.K. and Manmohan, problems in Operation Research, Sultan Chand & Sons.
4. Ravindran A., Philips D.T. and Solberg J.J., Operations Research, John Wiley & Sons.
5. Taha H.A., Operation Research, Macmillan pub. Company, New York.
6. Linear Programming, Transportation, Assignment Game by Dr. Paria, Books and Allied(p) Ltd., 1999
7. V. Sundaresan, K.S. Ganapathy Subramanian and K. Ganesan, Resource Management Techniques..
A.R. Publications.

COURSE OUTCOME

CO1: Understand and solve linear programming problem using graphical and simplex methods.

CO2: Obtain the optimal solution for Transportation and Assignment problems.

CO3: Describe and solve problems on Game theory and Sequencing problem.

CO4: Understand and solve the problems of Queuing theory.

CO5: Design a project network and solve problems based on CPM and PERT.

SKBPC