Sri Sankara Arts & Science College
(Autonomous)
Department of Mathematics

Effective from the academic year 2019-2020
B.Sc., Mathematics
Scheme of Examination

B.Sc Mathematics Credits

Si. No	Study Components	B.Sc.,		
		Number of papers	Credits per paper	Total Credits
1	Language courses(lc)	4	3	12
2	English language courses	4	3	12
3	Core Paper	15	4	60
4	Elective Papers	3	5	15
5	Allied Papers & Praticals	6	/3+3+4/+ /3+3+4/	20
6	Part IV course:			
	a).Advance Tamil /non-major elective	2	2	4
	b).Skill based courses	4	3	12
	c). Environmental studies	1	2	2
	d).Value education	1	2	2
7	Part V: Extension activities	1	1	1
			Total	140

Effective from the academic year 2019-2020
B.Sc., Mathematics
Scheme of Examination

I Semester

Course Components /Title of the Paper	Credits	Ins Hours	CIA	EXT	Total
Part I-Language Paper-I	3	4	25	75	100
Part II- English Paper-I	3	4	25	75	100
Part III Core Paper I : Algebra and Trigonometry	4	5	25	75	100
Core Paper II: Differential Calculus	4	4	25	75	100
Allied Paper I	4	9	25	75	100
Part IV Basic Tamil/Adv. Tamil/Non Major Elective-I	2	2	25	75	100
Soft Skills-I	3	2	50	50	100

II Semester

Course Components /Title of the Paper	Credits	Ins Hours	CIA	EXT	Total
Part I-Language Paper-II	3	4	25	75	100
Part II- English Paper-II	3	4	25	75	100
Part III Core Paper III : Integral Calculus	4	5	25	75	100
Core Paper IV: Differential Equations	4	4	25	75	100
Allied Paper II	6	9	25	75	100
Part IV Basic Tamil/Adv. Tamil/Non Major Elective-II	2	2	25	75	100
Soft Skills-II	3	2	50	50	100

III Semester

Course Components /Title of the Paper	Credits	Ins Hours	CIA	EXT	Total
Part I-Language Paper-III	3	4	25	75	100
Part II- English Paper-III	3	4	25	75	100
Part III Core Paper V : Fourier Series and Integral Transforms	4	5	25	75	100
Core Paper VI: Analytical Geometry	4	4	25	75	100
Allied Paper III	4	9	25	75	100
Part-IV- Soft Skills-III	3	2	50	50	100

IV Semester

Course Components /Title of the Paper	Credits	Ins Hours	CIA	EXT	Total
Part I-Language Paper-IV	3	4	25	75	100
Part II- English Paper-IV	3	4	25	75	100
Part III Core Paper VII : Numerical Methods	4	5	25	75	100
Core Paper VIII: Statics	4	4	25	75	100
Allied Paper IV	6	9	25	75	100
Part-IV Environment studies	2	2	25	75	100
Soft Skills-III	3	2	50	50	100

V Semester

Course Components /Title of the Paper	Credits	Ins Hours	CIA	EXT	Total
Part III- Core Paper IX : Algebra -I	4	6	25	75	100
Core Paper X : Real Analysis - I	4	6	25	75	100
Core Paper XI: Dynamics	4	6	25	75	100
Elective Paper-I Choose from Group-A	5	5	25	75	100
Elective Paper-I Choose from Group-B	5	5	25	75	100
Part-IV Value Education	2	2	25	75	100

Group-A

1. Fundamentals of Accounting
2. Special Functions
3. Graph Theory

Group-B

1. Elementary Number Theory
2. C- Programming
3. Discrete Mathematics

VI Semester

Course Components /Title of the Paper	Credits	Ins Hours	CIA	EXT	Total
Part III- Core Paper XII : Algebra -II	4	6	25	75	100
Core Paper XIII : Real Analysis -II	4	6	25	75	100
Core Paper XIV: Complex Analysis	4	6	25	75	100
Core Paper XV: Operations Research	4	6	25	75	100
Elective Paper-III Choose from Group-C	5	6	25	75	100
Part-V Extension Activity	1	-	-	-	-

Group-C

1. Mathematical Modeling
2. Matrix Theory
3. Astronomy

CORE PAPER - I
ALGEBRA AND TRIGONOMETRY

To teach the concept of basic algebra and trigonometry.
After the completion of the course the student will be able to solving the problem on basic mathematics

ALGEBRA

Unit- 1

Polynomial equations - Imaginary and irrational roots - Relation between roots and coefficients - Symmetric functions of roots in terms of coefficients - Transformations of equations - Reciprocal equations
Chapter 6: section 9 to 12, 15, 15.1,15.2,15.3, 16, 16.1,16.2.

Unit-2

Increase or decrease the roots of the given equation - Removal of term - Descartes' rule of signs - Cardan's method of solution of a cubic polynomial - Summation of Series using Binomial - Exponential and Logarithmic series.
Chapter 6: section 17, 19, 24, 34, 34.1
Chapter 3: section 10,
Chapter 4: section 3, 3.1, 7.

Unit-3

Symmetric - Skew Symmetric – Hermitian - Skew Hermitian - Orthogonal Matrices - Eigen values - Eigen Vectors - Cayley - Hamilton Theorem - Similar matrices - Diagonalization of a matrix.
Chapter 2: section 6.1 to 6.3, 9.1, 9.2 , 16 , 16.1,16.2 16.3

TRIGONOMETRY

Unit –4

Expansions of power of $\sin\theta, \cos\theta$ - Expansions of $\cos^n\theta$, $\sin^n\theta\cos^m\theta$, $\sin^m\theta$
Expansions of sinnθ, cosnθ, tannθ - Expansion of $\tan(\theta_1+\theta_2+\ldots\ldots+\theta_n)$ - Expansion of sinX, CosX, tanX in terms of X - Sum of rows of trigonometry equations - formation of equation with trigonometric roots.
Chapter 2: section 2.1, 2.1.1, 2.1.2, 2.1.3,
Chapter 3: section 3.1 to 3.6

Unit-5

Hyperbolic functions - Relation between circular and hyperbolic functions - Formulas in hyperbolic functions - Inverse hyperbolic functions - Inverse function of exponential functions - Values of Log (u+iv) - Complex index.
Chapter 4: section 4.1 to 4.7,
Chapter 5: section 5.1 to 5.3

Contents and treatment as in

Unit - 1 and 2, Algebra Volume I by T. K. Manicavachagom Pillay, T.Natarajan, K.S.Ganapathy, Viswanathan Publication.
Unit – 3 Algebra Volume II by T. K. Manicavachagom Pillay, T.Natarajan, K.S.Ganapathy, Viswanathan Publication.
Unit - 4 and 5
Trigonometry by P. Duraipandian and Kayalal Pachaiyappa, Muhil Publishers.

Reference:

1. Algebra by S. Arumugam (New Gama publishing house, Palayamkottai)
2. Trigonometry by P. Duraipandian and Kayalal Pachaiyappa, Muhil Publishers

CORE PAPER -II

DIFFERENTIAL CALCULUS

To teach the concept of basic Calculus and application of integration
After the completion of the course the student will be able to solving problem on calculus

Unit- 1
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- 2
Total differential of a function – special cases – implicit functions - partial derivatives of a function of two functions - Maxima and Minima of functions of 2 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- 3
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- 4
p-r equations- 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- 5
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 4, section 5.1 , 5.2,6 and 7

Content and treatment as in
Calculus Vol- 1 by S. Narayanan and T.K. Manicavachagom pillay - S.Viswanathan publishers – 2006

Reference:
1. Calculus by Thomas and Fenny, Pearson Publication

CORE PAPER- III
INTEGRAL CALCULUS

To teach the concept of basic integral, Euler integral, line, volume and surface integrals
After the completion of the course the student will be able to find the areas and volume of defined and undefined shapes

Unit- 1

Reduction formulae –Types $\int x^n e^{ax}\,dx$, $\int x^n \cos ax\,dx$, $\int x^n \sin ax\,dx$, $\int cos^n xdx$ $\int sin^n xdx$, $\int sin^m xcos^n xdx$, $\int tan^n xdx$, $\int cot^n xdx$, $\int sec^n xdx$, $\int cosec^n xdx$ $\int x^n (logx)^m dx$. Bernoulli's formula.
Chapter 1: section 13, 13.1 to 13.10,14,15.1

Unit- 2

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

Unit- 3

Beta and Gamma functions- indefinite integral – definitions – convergence of Γ(n) – recurrence formula of Γ functions – properties of β-function- relation between β and Γ functions
Chapter 7: sections 1.1 to 1.4 , 2.1 to 2.3, 3, 4,

Unit-4

Introduction, Gradient, divergence, curl, directional derivative, unit normal to a surface. Solenoidal and irrotational. Laplacian Differential Operator.
Chapter 2: sections 2.1to 2.11

Unit-5

Line, surface and volume integrals; Theorems of Gauss, Stokes and Green. (Without proof) – Problems.
Chapter 4 Page.no; 132-135,156-160,167-170

Content and treatment as in

Calculus Vol- II by S. Narayanan and T.K. Manicavachagom pillay - S. Viswanathan publishers – for Unit 1 , Unit 2 , Unit 3
Vector Analysis by Duraipandian. Chand publishers for unit 4 & 5

Reference :-

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

CORE PAPER- IV
DIFFERENTIAL EQUATIONS

To teach the concept of basic ODE and PDE
After the completion of the course the student will be able to solving problems for differential

Unit- 1
Homogenous equations - Exact equations - Integrating factor - Linear equations - Reduction of order.
Chapter 2: sections 7-11

Unit- 2
Second order linear differential equations introduction - General solution of homogenous equations - The use of known solution to find another - Homogeneous equation with constant coefficients - Method of undetermined coefficients - Method of variation of parameters.
Chapter 3: sections 14-19

Unit -3
System of first order equations - Linear systems - Homogeneous linear systems with constant coefficients. (Omit non-homogeneous system of equations)
Chapter 10: sections 55 and 56

Unit-4
Formation of P.D.E by eliminating arbitrary constants and arbitrary functions - complete integral;Singular integral - general integral - Lagrange's equations Pp + Qq=R.
Chapter 0 sections 0.4 and 0.5

Unit-5
Charpit"s method and Special types of first order equations.
Chapter 0 sections 0.11, 0.11.1

Contents and treatment as in

1. Differential equations with Applications and Historical Notes by George F. Simmons Second Edition, Tata Mcgraw Hill Publications. Unit 1, 2 and 3
2. Introduction to Partial Differential Equations Second Edition by K.Sankara Rao, PHI Learning Private Limited. Unit 4 and 5

Reference:-

1. Differential Equations by Simmons.
2. Partial Differential Equations by Sneddon.
3. Ordinary and partial differential equations by Dr.M.D.Raisinghania S.Chand

CORE PAPER V
FOURIER SERIES AND INTEGRAL TRANSFORMS

To teach the concept of basic application of integrals

After the completion of the course the student will be able to solving problem on special type of integrals.

Unit- 1

Fourier Series – periodic functions- Dirichlet condition – odd and even function – full and half range Fourier Series – change of intervals.

Chapter 12: section 12.1 to 12.11

Unit-2

Laplace Transformation – Laplace transform of standard function – periodic functions.

Chapter 13: section 13.1 to 13.15

Unit-3

Inverse Laplace Transformation – inverse transform by partial fractions –inverse transform by differentiation and integration.

Chapter 13: section 13.20 to 13.28

Unit- 4

Application of Laplace Transformation – solution of linear differential equation upto second order.

Chapter 13: section 13.29 to 13.32

Unit- 5

Integral Transform – Application of Laplace and Fourier – convolution theorem – Parseval's identity – solution of boundary value problem.

Chapter 14: section 14.1to 14.14

Contents and treatment as in

Advanced Enginearing Mathematics by H.K. Dass, S Chand and company

References:-

1. Engineering Mathematics volume 3 : M.K. Venkataraman (National Publishing Co.)
2. Engineering Mathematics volume 3 : P.Kandasamy and others (S.Chand and Co.)
3. Advanced Engineering Mathematics: Stanley Grossman and William R.Devit (Harper and Row publishers)

CORE PAPER - VI
ANALYTICAL GEOMETRY

To teach the concept of basic 2D and 3D

After the completion of the course the student will be able to difference between 2D and 3D problems

Unit- 1

Pair of straight line – homogenous equation of n^{th} degree in x and y – condition that the general equation of the second degree to represent a pair of straight line

Chapter 3

Unit-2

System of circles – polar equation –radical axis of two circles – orthogonal circles – equation of any two co-axal system – general form.

Chapter 5 & 9 (section 9.10-9.13)

Unit-3

The plane – equations of planes bisecting the angle between two planes – straight determine as the intersection of two planes.

Chapter 2 (section 2.8- 2.11)

Chapter 3

Unit- 4

The Sphere – equation of sphere when center and radios are given - general equation of sphere - length of tangent from the point to the sphere.

Chapter 4

Unit- 5

Central quadrics and cone - equation of then surface – right circular cone – intersection of straight line and a quadric cone.

Chapter 5

Contents and treatment as in "Analitic Geomentry part I (UNIT I & II) and Part II (UNIT III, IV & V) by T.K.ManikavachagomPilai and T.Natrajan, S.Viswanathan Publishers.

References:-

1. Analytical Solid Geometry of 3D by Shanthi Narayan and Dr.P.K. Mittal
2. P. Duraipandian, Laxmi Duraipandian and D.Muhilan, Analytical Geometry 3 Dimensional Emerald publishers,
3. N.P.Bali, Solid Geometry, Laxmi Publications(P)Ltd, Edition

CORE PAPER VII
NUMERICAL METHODS

To teach the concept of basic numerical methods.
After the completion of the course the student will be able to solving problem on numerical differentiation, numerical integration and solution to ordinary differential equations.

Unit - 1
Algebraic and Transcendental Equations
Chapter-3: section 3.0-3.6

Unit - 2
Simultaneous Equations
Chapter-4: section 4.3-4.5and 4.8

Unit - 3
Eigen Values and Vectors of a Matrix
Chapter-5: section 5.0 -5.2
Interpolation
Chapter-7: section 7.1 and 7.3

Unit - 4
Numerical Differentiation and Integration
Chapter-8: section 8.1-8.3 and 8.5-8.7

Unit - 5
Numerical Solutions of Ordinary Differential Equations
Chapter-10: section 10.0-10.5

Contents and treatment as in Numerical Methods by Dr. P.Kandasamy, Dr. K. Thilagavathy and Dr. K. Gunavathi. S.Chand and Company Ltd

Reference Book

1. Numerical Methods With Programming in C by T. Veerarajan and T. Ramachandran.
2. Introductory Methods of Numerical Analysis by S.S.Sastry
3. Numerical Methods by S.Arumugam,A.ThangapandiIssac and A.Somasundram, ScitechPublication.

CORE PAPER- VIII
STATICS

To teach the concept of basic stability of the particles.
After the completion of the course the student will be able to solving problem of motion equation

Unit-1

Newton's laws of motion - resultant of two forces on a particle- Equilibrium of a particle- Limiting Equilibrium of a particle on an inclined plane
Chapter 2: section 2 .1 , 2.2 ,
Chapter 3 - section 3.1 and 3.2

Unit-2

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-3

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-4

Centre of mass – finding mass centre – a hanging body in equilibrium – stability of equilibrium – stability using differentiation
Chapter 6: section 6.1 to 6.3
Chapter 7: section 7.1, 7.2

Unit-5

Virtual work – hanging strings- equilibrium of a uniform homogeneous string – suspension bridge
Chapter 8: section 8.1
Chapter 9: section 9.1, 9.2
Contents and treatment as in "Mechanics – P. Duraipandian , Laxmi Duraipandian , Muthamizh Jayapragasham, S. Chand and Co limited

Reference Book

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

CORE PAPER- IX

ALGEBRA - I

To teach the concepts of basic group, ring theory

After the completion of the course the student will be able to solving problem on group theory and ring theory.

Unit -1

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 -2

Normal subgroups and Quotient group - Homomorphism - Automorphism.

Chapter 2: section 2.6 to 2.8

Unit - 3

Cayley's Theorem - Permutation groups.

Chapter 2: section 2.9 and 2.10

Unit -4

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 – 5

The field of quotients of an integral domain - Euclidean Rings - The particular Euclidean ring.

Chapter 3: section 3.6 to 3.8

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

Reference Book :-

1. Modern Algebra by M.L.Santiago, Mcgraw Hill Education India Pvt Ltd.
2. Modern Algebra by S. Arumugam and others, New Gamma publishing House, Palayamkottai.
3. Modern Algebra by Visvanathan Nayak

CORE PAPER-X

REAL ANALYSIS –I

To teach the concept of set, function, sequence and series of real numbers.
After the completion of the course the student will be able to solve problems on sets, functions, sequence and real numbers.

Unit – 1
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 – 2
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 – 3
Operations on convergent sequences - operations on divergent sequences - limit superior and limit inferior - Cauchy sequences.
Chapter 2: section 2.7 to 2.10

Unit- 4
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 l^2
Chapter 3 : section 3.1 to 3.4, 3.6, 3.7 and 3.10

Unit – 5
Limit of a function on a real line;. Metric spaces; Limits 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 :-

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

CORE PAPER- XI
DYNAMICS

To teach the concept of basic nature of the motions.
After the completion of the course the student will be able to solving problem on Simple harmonic motion, Projectile and etc.

Unit -1
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 - section 1.1 to 1.4,
Chapter 10 - section 10.1 to 10.6

Unit – 2
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 11.1to 11.3
Chapter 12 - section 12.1 to 12.4

Unit – 3
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 - section 13.1 to 13.3
Chapter 14 - section 14.1, 14.5

Unit – 4
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 - central orbits- conic as centered orbit.
Chapter 15 - section 15.1 to 15.6
Chapter 16 - section 16.1 to 16.3

Unit – 5
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 "dynamic " – A.V.Dharmapadan, S. Visvanathan printer and publishers-

Reference Books:

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

CORE PAPER-XII

ALGEBRA– II

To teach the concepts of advance linear algebra.
After the completion of the course the student will be able to solving problem on type of matrixs.

Unit – 1
Vector spaces. Elementary basic concepts; linear independence and bases

Chapter 4: section 4.1 and 4.2

Unit – 2
Dual spaces

Chapter 4: section 4.3

Unit – 3
Inner product spaces.

Chapter 4: section 4.4

Unit – 4
Algebra of linear transformations; characteristic roots.

Chapter 6: section 6.1 and 6.2

Unit – 5
Matrices; canonical forms; triangular forms.

Chapter 6: section 6.3 and 6.4

Contents and treatment as in " Topics in algebra ., I.N.Herstein wiley Eastern Ltd., (second edition).

Reference :

1. Surjeetsingh, Qazizameerudding, Modern algebra vikas publishing house 8th edition 2006.
2. seymorelipschutz, Beginning linear algebra , Tata Mc'graw hill , 2005
3. S.G Venkatachalapthy, modern algebra marghan publications. 2008
4. Ward chenay dewed Kincaid , Linear algebra theory and applications 1st Edition 2010.

CORE PAPER-XIII
REAL ANALYSIS - II

To teach the concept of set, function, sequence and series of real numbers.
After the completion of the course the student will be able to solve problems on sets, functions, sequence and real numbers.

UNIT-I
Continuous function on metric spaces, Functions continuous at a point on the real line – open sets – closed sets- discontinuous functions on R^1
Chapter : 5 section : 5.1,5.4,5.5,5.6. (omit 5.2,5.3) Page no. 113-115, 121-131.

UNIT-II
Connectedness, completeness and compactness. More about open sets- connected sets-bounded set and totally bounded set- complete metric space- compact metric spaces- continuous functions on compact metric space- continuity of the inverse function –uniform continuity.
Chapter : 6 section : 6.1-6.8 Page no. 133-155.

UNIT-III
Calculus Sets of measure zero- definition of the Riemann integral- Existence of the Riemann integral – Properties of the Riemann integral.
Chapter : 7 section : 7.1-7.4 Page no.156-169.

UNIT-IV
Derivatives- Rolle's theorem. Mean value theorem - Fundamental theorems of calculus.
Chapter : 7 section : 7.5,7.9 Page no. 170-194

UNIT-V
The elementary functions and sequence and series of the function. Taylor's theorem- L Hospital rule- sequence and series of the function.
Chapter : 8 section : 8.5, 8.7 (omit 8.1,8.2,8.3,8.5,8.6)
Chapter : 9 section : 9.1-9.4 (omit 9.5,9.6,9.7)

Contents and treatment as in " Methods of Real analysis by Richard R.Goldberg.

Reference:

1. A First course in mathematical Analysis by D.Somasundram and B.Choudhary , Narosa publication.
2. Principles of mathematical analysis by Walter Rudin.
3. Mathematical Analysis by Tom.M.Apostal.

CORE PAPER-XIV
COMPLEX ANALYSIS

To teach the concept of basic complex numbers and analytic function
After the completion of the course the student will be able to solving problem on complex plane

Unit – 1
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 functions.
Chapter 2 - Page 35-78

Unit – 2
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 - Page 311-324, 330-336.

Unit – 3
Complex Valued functions- contours - contour integrals - Anti derivatives - Cauchy-Goursat theorem. Cauchy integral formula - derivatives of analytic function – Liouvillie's theorem and fundamental theorem of algebra -maximum moduli of functions.
Chapter 4 - Page 117-135, 142-156, 164-178

Unit – 4
Convergence of sequences and series – Taylor's series –Laurent's series - zeros of analytic functions.
Chapter 5 - Page 181-205

Unit – 5
Residues - Residue theorems- Three types of isolated singular points- Residues at poles- Zeros and poles of order "m" - Evaluation of improper integrals – Improper integrals involving sines and cosines - Definite integrals involving sines and cosines – Argument principle and Rouche's theorem.
Chapter 6 - Page 229-249,261-276
Chapter 7 - Page 288-296

Contents and treatment as in Complex variables and Applications (Eighth Edition) by James Ward Brown and Ruel V.Churchill, Mc.Grawhill Inc.

Reference book:

1. Complex analysis by P.Duraipandian and kayalal pachaiappas, S.Chand publications
2. Complex Analysis by venkatachalapathy.
3. Introduction to complex analysis S.Ponnuswamy, Narosa publishers.

CORE PAPER-XIV

OPERATIONS RESEARCH

To teach the concept of basic operation research.
After the completion of the course the student will be able to solving problem on linear programming.

UNIT-I

Linear Programming Formulation and Graphical method Formulation and Graphical solution- Requirements for employing LPP Techniques – Mathematical Formulation of LPP- basic assumptions- Graphical methods of the solution of a LPP –Some more cases.
Chapter : 2 section : 2.1-2.6 (omit 2.7,2.8) Page no.2.1-2.32

UNIT-II

General linear programming problem and Transportation modal General linear programming problem – canonical and standard forms of LPP- the simplex method – the simplex algorithm- artificial variables techniques- the big M method- the two phase method.
Transportation modal: mathematical formulation of a transportation problem- methods for finding initial basic feasible solution- NWCR-LCM-VAM- MODI method –unbalanced transportation problem- maximization case in transportation.
Chapter : 3 section : 3.1-3.2 Page no.3.1-3.53.
Chapter : 7 section : 7.1-7.5 Page no. 7.1-7.53.

UNIT-III

Assignment problem and sequencing problem. Mathematical formulation of an assignment problem- comparison with transportation modal- Difference between the Transportation problem and Assignment problem. Hungarian method- unbalanced Assignment problem.- maximization case in Assignment problem – restrictions in assignment – Travelling salesman problem.
Sequencing problems: sequencing problems- the following simplifying assumptions are made while procedure for determine the optimal sequence for n jobs on 2 machines- processing n jobs on three machines- processing n jobs on m machines- processing of two jobs on n machines- Graphical method.
Chapter : 8 section : 8.1-8.9 Page no. 8.1 - 8.39.
Chapter : 14 section : 14.1-14.7 Page no. 14.1 - 14.12.

UNIT-IV

Game theory – two person zero sum games- the maximin – minimax principal- saddle point and value on the game – games without saddle points – mixed strategies.- matrix odd ment method for $n \times n$ games graphical method for $2 \times n$ or $2 \times m$ games – linear programming method.
Chapter : 16 section : 16.1-16..8 Page no. 16.1- 16.45.

UNIT –V

PERT- CPM- Planning – Scheduling – Control – Basic Terminologies –Rules for Constructing a project network – ford and Fulkerson's Rule – Network computations – Floats – PERT – Difference between PERT and CPM- Cost consideration in PERT and CPM- Project scheduling with Limited Resources.
Chapter : 15 section : 15.1-15.9 Page no. 15.1-15.63.

Contents and treatment as in Operation Research (Resource management Techniques) V.Sundaresan A.R.S Publication 10^{th} edition.

Reference book:

Operation research by J.K Sharma

Elective Paper: I

FUNDAMENTALS OF ACCOUNTING

To enable the students to learn the Principles and Concepts of Accountancy

UNIT – I

Accounting: Meaning- Definition –Nature and Scope of Accounting-ObjectivesAdvantages – Accounting Cycles, Concepts and Conventions – Accounting Rules – Journal, Ledger and Trial Balance.

UNIT – II

Subsidiary books- meaning - types of subsidiary books- Purchase- Purchase Return - Sales - Sales Return Book - Cash Book-Single Column, Double Column and Triple column cash book.

UNIT III

Bank Reconciliation Statements: Reconciliation between Cash Book, Pass Book and overdraft - Problems relating to the preparation of Bank Reconciliation Statement

UNIT – IV

Preparation of final accounts – Trading, Profit and loss account and balance sheet (With Adjustments)

UNIT – V

Bills of exchange: Definition – features – advantages- types – Bills honoured and maturity- Bills discounted with bank – Bills endorsed to creditor – Bills for collection – Retiring of bill before due date – Dishonour of bill.Note: The Syllabus will have 20 % Theory and 80 % Problems.

Recommended book: 1. T.S.Reddy and A.Murthy Financial Accounting, Margham Publishers, 24, Rameshwaram Road, T.Nagar, Chennai -600017, 7thEdition – 2016.

Reference Books:

1. T.S. Grewal, Introduction to Accountancy, Sultan Chand & Company Ltd, 7361 Ram Nagar, New Delhi – 110 055, Edition 2014.
2. K.L.Narang, S.P.Jain, Advanced Accountancy, Kalyani Publishers, B-I/1292, Rajinder Nagar, Ludhiana – 141008, 18thEdition – 2014.
3. N. Vinayagam, P.L. Mani, K.L. Nagarajan, Principles of Accountancy, Eurasi Publishing House, Edition-2013
4. V. Rajasekaran & R. Lalitha, “Financial Accounting”, Pearson India Limited, New Delhi, 1st Edition, 2011.

Elective Paper: II

SPECIAL FUNCTIONS

To teach the concept of advanced equation and its applications

After the completion of the course the student will be able to solving problem on different type the equation.

Unit – 1

Introduction and Review of power series – Series solution of first order differential equations Chapter 5 Sections 26 and 27.

Unit-2

Second order linear differential equations-Regular, singular points.

Chapter 5 Sections 28 and 29

Unit – 3

Regular singular points continued: Gauss's hyper geometric equations.

Chapter 5 Sections 30 and 31

Unit – 4

Legender polynomials-Properties of Legender polynomials

Chapter 8 Sections.44 and 45

Unit – 5

Bessel functions and Gamma functions-Properties of Bessel Functions.

Chapter 8 Sections 46 and 47

Contents and treatment as in Differential equations with Applications and Historical Notes by George F. Simmons Second Edition ,TataMcgraw Hill Publications.

Reference Books

1. Differential Equations by D. Raisinghania.2.Differential Equations by Ganesh C.Gorian

Elective Paper: III
GRAPH THEORY

To teach the concept of advanced graphical and its applications
After the completion of the course the student will be able to solving problem on using the vertex and edges using the graphs.

Unit – 1
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 Sections 2.0 – 2.9
Unit – 2
Degree sequences and graphic sequences – simple problems. Connectedness, walks, trails, paths, components, bridge, block, connectivity – simple problems.
Chapter 3 Sections 3.0 – 3.2 , Chapter 4 Sections 4.0 – 4.4
Unit – 3
Eulerian and Hamiltonian graphs
Chapter 5 Sections 5.0 – 5.2
Unit – 4
Trees – simple problems. Planarity : Definition and properties, characterization of planar graphs.
Chapter 6 Sections 6.0 – 6.2 ,Chapter 8 Sections 8.0 – 8.2
Unit – 5
Digraphs 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

Elective Paper: IV

ELEMENTARY NUMBER THEORY

To teach the concept of basic mathematics using number.

After the completion of the course the student will be able to solving problem on relationship between the numbers.

Unit 1

Introduction – divisibility- primes- The Binomial theorem

Chapter 1 Sections - 1.1 to 1.4

Unit 2

Congruences, Solution of Congruences, Chinese Remainder Theorem- primitive roots and power Residues- Number Theory from an Algebric view point - Groups, rings and fields.

Chapter – 2 Sections 2.1 to 2.3, 2.8 (cor 2.42, Th 2.43 and cor 2.44 are omitted) - 2.10.- 2.11

Unit 3

Quadratic Residues , Quadratic reciprocity , The Jacobi Symbol

Chapter – 3 Sections 3.1 to 3.3

Unit 4

Greatest Integer Function, Arithmetic function, The Mobius Inversion formula Combinational Number Theory

Chapter – 4 Sections 4.1 to 4.3 and 4.5

Unit 5

The equation ax+by=c, Simultaneous Linear Equations, Pythagorean Triangle, Assorted examples.

Chapter – 5 Sections 5.1 to 5.4

Content and treatment as in - An introduction to the Theory of Numbers (Vth edition) by Ivan Niven, Herbert S. Zuckarman and Hugh L. Montgometry John Wiley & Sons, Inc.2001.

Reference Books:

1. Elementary theory of numbers, C.Y.Hsiung, Allied publishers,
2. Elementary Number Theory, Allyn and Bacon Inc., Boston,
3. Introduction to Analytic Number Theory, Tom. M. Apostol, Narosa Publishing House, New Delhi,

Elective Paper: V
PROGRAMMING LANGUAGE 'C' WITH PRACTICALS&THEORY

To teach the concept of language C.
After the completion of the course the student will be able to solving problem very short time using the C language of some special programme.

Unit - 1

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 Sections 2.1 - 2.8 , Chapter 3 Sections 3.1 – 3.7, 3.12 ,Chapter 4 Sections 4.2 – 4.5

Unit – 2

Decision making and branching: Simple if, if e lse, 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 Sections 5.1 – 5.9 ,Chapter 6 Sections 6.1 – 6.5

Unit - 3

Arrays : One dimensional and 2 dimensional arrays – declarations – initialization of arrays– Operation on strings-String handling functions.
Chapter 7 Sections 7.1 – 7.4 ,Chapter 8 Sections 8.1 – 8.8

Unit – 4

Functions : Function definition and declaration – Categories of functions – recursion – Concept of pointers. Function call by reference - call by value.
Chapter 9 Sections 9.1 – 9.13 Chapter 11 Sections11.1-11.5

Unit – 5

Definition, operations on files- file operation functions. Chapter 12, Sections 12.1 – 12.

Content 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. Gottfied, B.S : programming with C , Schaum‟s outline series, TMH 2001
3. YashvantKanitkar, Let us 'C ' BPB Publications

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

Elective Paper: VI
DISCRETE MATHEMATICS

To teach the concept of discrete mathematics.
After the completion of the course the student will be able to solving problem very logically.

Unit- 1

Set, some basic properties of integers, Mathematical induction, divisibility of integers, representation of positive integers Chapter 1 - Sections 1.1 to 1.5

Unit – 2

Boolean algebra, two element Boolean algebra, Disjunctive normal form, Conjunctive normal form Chapter 5 - Sections 5.1 to 5.4

Unit – 3

Application, Simplication of circuits, Designing of switching circuits, Logical Gates and Combinatorial circuits.
Chapter 5 - Section 5.5, 5.6

Unit – 4

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 – 5

Introduction, Walk, Path and cycles, Euler circuit Chapter 7 - Sections 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. Mertt, Abraham Kendel and T. P. Baker prentice-hall, India.
2. Discrete mathematics for computer scientists by John Truss-Addison Wesley.
3. Elements of Discrete Mathematics, C. L. Liu, New York Mcgraw-Hill, 1977

Elective Paper: VII
MATHEMATICAL MODELING

To teach the concept of situations requiring mathematical modeling.
After the completion of the course the student will be able to solving problem based on modeling

Unit–1

Mathematical Modeling : Simple situations requiring mathematical modeling, characteristics of mathematical model.
Chapter 1 Sections 1.1-1.5

Unit – 2

Mathematical Modeling through differential equations: Linear Growth and Decay Models. Non-Linear growth and decay models,Compartment models.
Chapter 2 Sections 2.1- 2.4

Unit – 3

Mathematical Modeling, through system of Ordinary differential equations of first order: Prey-predator models, Competition models, Model with removal and model with immigrations.
Epidemics: simple epidemic model, Susceptible-infected-susceptible(SIS) model, SIS model with constant number of carriers.
Medicine: Model for Diabetes Mellitus.
Chapter 3 Sections 3.11,3.12,3.2.and 3.51

Unit – 4

Introduction to difference equations.
Chapter 5 Sections 5.1 and 5.2

Unit - 5

Mathematical Modeling, through difference equations:Harrod Model, cobweb model application to Actuarial Science
Sections 5.3 (5.3.3 not included)

Content and treatment as in

J N Kapur, Mathematical Modeling, New Age International publishers.(2009)

Reference Books:-

1. Mathematical Modeling by Bimal k . Mishra and Dipak K.Satpathi

Elective Paper: VIII
MATRIX THEORY

After the completion of the course the student will be able to solving problem using matrix

Unit–1
Determinants
Page 948-978

Unit – 2
Algebra of matrices
Page 979-1004

Unit – 3
Rank of matrices
Page 1005 - 1015

Unit – 4
In Consistency of linear system of equation and their solution.
Page 1016-1044

Unit - 5
Eigen valus, vector and Caley Hamilton theorem, Diagonolisation.
Page 1045-1095

Content and treatment as in
Mathematical physis by H.K.Dass and DR. Ramaverma, S.chand Publications.

Reference:

1. Algebra: by S. Arumugam (New Gama publishing house, Palayamkottai)

Elective Paper: IX
ASTRONOMY

To teach the concept of introduce the students to space science.
After the completion of the course the student will be able to know the important features of the planets , sun, moon and stellar universe

UNIT 1
Selestial sphere – Diurnal motion – Simple problems.

UNIT 2
Zones of earth – Terrestrial latitudes and longitudes – Rotation of earth, Dip of the horizon – Simple problems.

UNIT 3
Twlight – Simple problems – Astronomical refraction – Simple problems (No derivatation).

UNIT 4
Kepler's law – Simple problems
Page 172-189. (Use results of 159, 160 to solve the problems. No needed to derive the results).

UNIT 5
Moon phases of moon – Eclipse – Introduction – Umbra and Pen umbra – Lunar Eclipse – Solar eclipse – Condition for the occurrence of Lunar and Solar Eclipse.
Page 334 – 377. (Use results of 270, 271, 272 to solve the problems. No needed to derive the results).

RECOMMENDED TEXT
S. Kumaravelu and Susheela Kumaravelu. (2004) Astronomy. SKV PUBLISHERS, NAGARKOIL.

Reference book:
1. Astronomy for graduate & post graudege classes byr rukmani ramachandran,
2. Astronomy by G.V.Ramachandran, mission press, palayamkottai.

Department Offers the Allied Papers

For B.Sc., Mathematics & Computer Science, MBA, M.Com

Title of the Paper	Statistics-I
To teach the concept of sampling distribution , and theory of estimations , some special tests After the completion of the course the student will be able to analysis the data using specific tests	
Unit I	Sampling Distribution, Chapter-1, Sec 1.1-1.17
Unit II	Sampling Distribution Concepts, Chapter-2, Sec 2.1-2.14
Unit III	Theory of Estimation, Chapter-3, Sec 3.1-3.16
Unit IV	Test of Significance, Chapter-4, Sec 4.1-4.14
Unit V	Chi-Square Test, Chapter-5, Sec 5.1-5.11
Recommended Text Book	Statistics for management by P.N.Arora and S.Arora, S.Chand publications.
Reference Book	1. Guptha, S.C and Kapoor.V.K, Fundamentals of Mathematical Statistics, S. Chand & Sons, 2002. 2. S. P. Gupta, Statistical Methods, S. Chand, 2002. 3. John. E. Freund's , "Mathematical statistics with applications, Dorling EindersleyPvt.Ltd, 2014.

Department Offers the Allied Papers

For B.Sc., Mathematics& Computer Science, MBA, M.Com

Title of the Paper	Statistics-II
To teach the concept of basic complex numbers and analytic function After the completion of the course the student will be able to solving problem on complex plane	
Unit I	F-Distribution and ANOVA Table, Chapter-6, Sec 6.1-6.14
Unit II	Correlation Analysis, Chapter-7, Sec 7.1-7.16
Unit III	Regression Analysis, Chapter-8, Sec 8.1-8.17
Unit IV	Non- Parametric Methods, Chapter-10, Sec 10.1-10.9
Unit V	Non- Parametric Methods, Chapter-10, Sec 10.10-10.15
Recommended Text Book	Statistics for management by P.N.Arora and S.Arora, S.Chand publications.
Reference Book	1. Guptha, S.C and Kapoor.V.K, Fundamentals of Mathematical Statistics, S. Chand & Sons, 2002. 2. S. P. Gupta, Statistical Methods, S. Chand, 2002.

Department Offers the Allied Papers
For B.Sc Computer Science, BCA, Physics,CST

Mathematics -I

UNIT – I

Numerical Methods: Newton-Raphson method; Newton‟s forward and backward interpolation formulae for equal intervals, Lagrange's interpolation formula.

UNIT- II

Symmetric, Skew-Symmetric, Orthogonal, Hermetian, Skew-Hermetian and Unitary matrices. Eigen values and Eigen-vectors, Cayley-Hamilton theorem (without proof)

UNIT- III

Polynomial equations with real coefficients, irrational roots, complex roots, symmetric functions of roots, transformation of equation by increasing or decreasing roots by a constant, reciprocal equation.

UNIT IV

Expansions of $\sin(n\theta)$ and $\cos(n\theta)$ in a series of powers of $\sin\theta$ and $\cos\theta$ - Expansions of $\sin^n\theta$, $\cos^n\theta$, $\tan^n\theta$ in a series of sines, cosines and tangents of multiples of "θ" - Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in a series of powers of "θ" .

UNIT V

Successive differentiation, n^{th} derivatives, Leibnitz theorem (without proof) and applications, Jacobians, Curvature and radius of curvature in Cartesian co-ordinates,

Recommended Text

Allied Mathematics by Dr. A. Singaravelu.

Reference Book:

All Allied Mathematics books.

Department Offers the Allied Papers
For B.Sc Computer Science, BCA, Physics, CST

Mathematics -II

Unit-I

Bernoulli's formula. Reduction formulae -$\int_0^{\frac{\pi}{2}} sin^n\, xdx$,$\int_0^{\frac{\pi}{2}} cos^n\, x$dx,$\int_0^{\frac{\pi}{2}} sin^m x\, cos^n\, xdx$ (m, n being positive integers), Fourier series for functions in (α,α +2π),

Unit-II

Ordinary Differential Equations: second order non- homogeneous differential equations with constant coefficients of the form ay" +by'+ cy = X where X is of the form $e^{\alpha x}$ cosβx and $e^{\alpha x}$sinβx

Unit-III

Partial Differential Equations: Formation, complete integrals and general integrals, four standard types and solving lagrange's linear equation P p +Q q= R

Unit-IV

LAPLACE TRANSFORMS:

Laplace transformations of standard functions and simple properties, inverse Laplace transforms, Application to solution of linear differential equations up to 2nd order- simple problems.

Unit – IV

VECTOR DIFFERENTIATION

Introduction, Scalar point functions, Vector point functions, Vector differential operator∇, Gradient, Divergence, Curl, Solenoidal, irrotational, identities.

.

Recommended Text

Allied Mathematics by Dr. A. Singaravelu.

Reference Book:

All Allied Mathematics books.

Department Offers the Allied Papers
For BCA, CST

Mathematics –III

Unit-1:

Introduction- Mathematical Preliminaries- Errors: Computations, Formula - Errors in a Series Approximation- Roots of Equations- Linear Equations: Bisection, False Position Methods- Newton-Raphson Method- Secant Method.

Unit-2:

Simultaneous Linear Equations: Gauss Elimination, Gauss-Jordan, LU Decomposition Methods- Gauss-Seidel Method

Unit-3:

Numerical Differentiation- Errors in Numerical Differentiation- Cubic Spline Method- Numerical Integration- Trapezoidal Rule- Simpson's 1/3 and 3/8 Rules-

Unit-4:

Romberg Integration- Ordinary Differential Equations- Taylor's Series Method- Euler's Method- Runge-Kutta 2^{nd} and 4^{th} Order Methods

Unit-5:

Sampling- Frequency Distribution- Cumulative Frequency Function- Grouped Sample- Measures of Central Tendency: Mean, Median and Mode- Geometric Mean- Harmonic Mean

Recommended Texts

1. S.S.Sastry, 2005,Introductory Methods of Numerical Analysis, 4^{th} Edition, Prentice- Hall of India Pvt. Ltd..(For Unit 1,2)
2. SC.Gupta, Fundamental of Mathematical Statistics (For Unit3,4,5)

Department Offers the Allied Papers
For BCA

Mathematics -IV

UNIT-I

Mathematical Formulation of LPP- basic assumptions- Graphical methods of the solution of a LPP –

UNIT-II

Transportation modal: mathematical formulation of a transportation problem- methods for finding initial basic feasible solution- NWCR-LCM-VAM- MODI method –unbalanced transportation

UNIT-III

Assignment problem.Hungarian method- unbalanced Assignment problem.- maximization case in Assignment problem – restrictions in assignment – Travelling salesman problem.

UNIT-IV

Sequencing problems: sequencing problems- the following simplifying assumptions are made while procedure for determine the optimal sequence for n jobs on 2 machines- processing n jobs on three machines- processing n jobs on m machines- processing of two jobs on n machines- Graphical method.

UNIT –V

PERT- CPM- Planning – Scheduling – Control – Basic Terminologies –Rules for Constructing a project network – ford and Fulkerson's Rule – Network computations .

Recommended Text:

Operation Research (Resource management Techniques) V.Sundaresan A.R.S Publication 10^{th} edition.

Reference book:

Operation research by J.K Sharma