

**SRI RAMAKRISHNA MISSION VIDYALAYA
COLLEGE OF ARTS AND SCIENCE**

**(Autonomous)
COIMBATORE – 641 020**



DEPARTMENT OF MATHEMATICS

**Under Choice Based Credit System (CBCS)
2016 – 2017 Onwards**

B.Sc. MATHEMATICS

SCHEME OF EXAMINATIONS

SEMESTER I									
S. No	Course code	Part	Title of the paper	Hrs	Credits	Exam hrs	Max marks		
							Int	Ext	Total
1	15UGC1TA1	I	Tamil I	6	3	3	25	75	100
2	16UGC1EN1	II	English I	6	3	3	25	75	100
3	13UMA1C01	III	Core 1:Algebra	5	4	3	25	75	100
4	13UMA1C02	III	Core 2:Calculus	5	4	3	25	75	100
5	13UMA1AL1	III	Allied 1: Physics -I	4	4	3	15	60	75
6	13UMA2AP1	III	Allied Practical : Physics	2	-	-	-	-	-
7	15UGC1ENS	IV	Environmental Studies	2	2	2	-	75	75
TOTAL - I				30	20		130	420	550
SEMESTER II									
1	15UGC2TA2	I	Tamil II	6	3	3	25	75	100
2	16UGC2EN2	II	English II	6	3	3	25	75	100
3	13UMA2C03	III	Core 3:Differential Equations and Laplace Transforms	5	4	3	25	75	100
4	13UMA2C04	III	Core 4: Trigonometry, Vector Calculus and Fourier Series	5	4	3	25	75	100
5	13UMA2AL2	III	Allied 2: Physics II	4	4	3	15	60	75
6	13UMA2AP1	III	Allied Practical: Physics	2	2	3	20	30	50
7	16UGC2VAE	IV	Value Education	2	2	2		75	75
TOTAL - II				30	22		150	450	600

SEMESTER III

S. No	Course code	Part	Title of the paper	Hrs	Credits	Exam hrs	Max marks		
							Int	Ext	Total
1	16UGC3TA3	I	Tamil III	6	3	3	25	75	100
2	16AUG3EN3	I	English III	6	3	3	25	75	100
3	13UMA3C05	III	Core 5: Analytical Geometry of 2D and 3D	5	4	3	25	75	100
4	13UMA3C06	III	Core 6: Statics	5	4	3	25	75	100
5	13UMA3AL3	III	Allied 3: Mathematical Statistics I	6	5	3	25	75	100
6	14UMA3NM1/ 15UGC3BT1	IV	NME I: Principles of Accountancy /Basic Tamil - I	2	2	2	-	50	50
TOTAL – III				30	21		125	425	550
SEMESTER IV									
1	16UGC4TA4	I	Tamil IV	6	3	3	25	75	100
2	16UGC4EN4	I	English IV	6	3	3	25	75	100
3	13UMA4C07	III	Core 7: Dynamics	5	4	3	25	75	100
4	13UMA4C08	III	Core 8 :Numerical Analysis	5	4	3	25	75	100
5	13UMA4AL4	III	Allied 4: Mathematical Statistics II	6	5	3	25	75	100
6	14UMA4NM2/ 15UGC4BT2	IV	NME 2: Cost and Management Accounting /Basic Tamil II	2	2	2	-	50	50
7	15UGC4NCC/ 15UGC4NSS/ 15UGC4SPO	V	Extension Activities (NSS/NCC/Sports)	-	1	2	25	25	50
TOTAL – IV				30	22		150	450	600

SEMESTER V

S. No	Course code	Part	Title of the paper	Hrs	Credits	Exam hrs	Max marks		
							Int	Ext	Total
1	13UMA5C09	III	Core 9: Modern Algebra	5	5	3	25	75	100
2	13UMA5C10	III	Core 10: Real Analysis I	5	5	3	25	75	100
3	16UMA5C11	III	Core 11: Complex Analysis	5	4	3	25	75	100
4	13UMA5C12	III	Core 12 : Discrete Mathematics	4	4	3	25	75	100
5	13UMA5C13	III	Core 13 : Operations Research I	5	4	3	25	75	100
6	13UMA5EL1	III	Elective 1: Web Programming	4	4	3	25	75	100
7	13UMA6EP1	III	Elective Practical: Web Programming and 'C'	2	-	-			-
TOTAL - V				30	26		150	450	600

SEMESTER VI

1	13UMA6C14	III	Core 14: Linear Algebra	5	5	3	25	75	100
2	13UMA6C15	III	Core 15: Real Analysis II	5	5	3	25	75	100
3	16UMA6C16	III	Core 16: Special Functions	4	4	3	25	75	100
4	13UMA6C17	III	Core 17: Operations Research II	5	4	3	25	75	100
5	13UMA6C18	III	Core 18: Astronomy	5	4	3	25	75	100
6	13UMA6EL2	IV	Elective 2 : Introduction to "C"	4	4	3	25	75	100
7	13UMA6EP1	IV	Elective Practical: Web Programming and 'C'	2	3	3	40	60	100
TOTAL - VI				30	29		190	510	700
Grand Total				180	140				3600

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**For candidates admitted from academic year 2013-2014 onwards
Under New CBCS**

Programme : B.Sc. Mathematics.

Course Title : Core 1: ALGEBRA

Year : First Year

Hours/Week : 5

Course Code : 13UMA1C01

Semester : I

Credits : 4

Unit -I

CONVERGENCY AND DIVERGENCY OF SERIES: Infinite series – Geometric series – some general theorems concerning infinite series- The series is convergent when k is greater than unity and divergent when k equal to or less than unity – Cauchy's condensation test- D'Alembert's Ratio test – Cauchy's Root test – Raabe's test.

Chapter 2: Sections 8 to 19

Unit-II

BINOMIAL THEOREM: Binomial theorem for rational index – Application of the Binomial theorem to the summation of series – Approximate values.

Chapter 3 Sections: 5 - 10 and 14

Unit –III

EXPONENTIAL AND LOGARITHMIC SERIES: The Exponential theorem – Summation - The Logarithmic series – Euler's constant – summation – The application of the exponential and logarithmic series to limits and approximations.

Chapter 4 Sections:1 - 11

Unit –IV

THEORY OF EQUATIONS: Roots of an equation – Relations between the roots and co-efficient of equations – Symmetric functions of the roots – Transformation of equations – Reciprocal equations

Chapter 6. Sections:1 to 12, 15 & 16

Unit -V

THEORY OF EQUATIONS (Cont.): To increase or decrease the roots of a given equation by a given quantity – Removal of terms – Descartes' Rule of signs - Roll's theorem – Multiple roots – Horner's method of approximation.

Chapter 6 Sections: 17, 19, 24 - 26 and 30. (Omit section 30.1)

TEXT BOOK:

**Algebra, Vol. I by Manickavachagam Pillay, T.Natarajan,
K.S.Ganapathy S.Viswanathan Pvt. Ltd (2007).**

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Programme : B.Sc. Mathematics.

Course Title : Core 2: CALCULUS

Course Code : 13UMA1C02

Year : First Year

Semester : I

Hours/Week : 5

Credits : 4

Unit-I

CURVATURE OF PLANE CURVES:Curvature – Circle, radius and centre of curvature – Cartesian formula for the radius of curvature – The coordinates of the centre of curvature - Evolutes and involutes –Radius of curvature when the curve is given in polar co-ordinates - Pedal equation of a curve.

PARTIAL DIFFERENTIATION:Total differential coefficient – Implicit functions – Homogeneous functions - Euler's theorem.

Chapter X: Sections 2.1 to 2.7, Chapter VIII: Sections 1.3 to 1.6

Unit-II

INTEGRATION:Integration of irrational functions – Properties of definite integrals - Integration by parts – Reduction Formulae.

Chapter 1: Sections 8 to 14

Unit-III

MULTIPLE INTEGRALS:Evaluation of the double integral – Change of order of integration – Double integral in polar co-ordinates – Triple integrals – Applications of Multiple integrals – Volumes of solids of revolution – Volumes of solids as double integrals – Volume as a triple integral.

Chapter 5: Sections 1 to 6.3

Unit-IV

CHANGE OF VARIABLES:Jacobian – Two important results regarding Jacobians - Change of variables in the case of two variables – Change of variables in the case of three variables. Transformation from Cartesian to polar co-ordinates – Transformation from Cartesian to spherical polar co-ordinates.

Chapter 6: Sections 1.1 to 2.4

UNIT-V

IMPROPER INTEGRALS:Beta and Gamma functions – Recurrence formula for Gamma functions – Properties of Beta functions - Relation between Beta and Gamma functions – Applications of Gamma functions to multiple integrals.

Chapter 7: Sections 2.1 to 6

TEXT BOOK:

1. **Calculus, Vol 1 – S.Narayanan and T.K.M. Pillai**, Viswanathan Publishers, 2007.
For Unit I
2. **Calculus, Vol 2 – S.Narayanan and T.K.M. Pillai**, Viswanathan Publishers, 2007.
For Units II to V

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**For candidates admitted from academic year 2013-2014 onwards
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Programme :B.Sc. Mathematics.

Course Title : Core 3: DIFFERENTIAL EQUATIONS

AND LAPLACE TRANSFORMS Course Cod : 13UMA2C03

Year : First Year

Semester : II

Hours/Week : 5

Credits : 4

Unit –I

DIFFERENTIAL EQUATIONS : Differential Equations of Non homogeneous equations - Bernoulli's equation. Differential Equations of the first order, but of the higher degree - Equations solvable for dy/dx – Equations solvable for y - Equations solvable for x - Clairaut's form.

Vol III: Chapter 1 section 2.1 to 2.5,5.1 to 6.1

Unit –II

DIFFERENTIAL EQUATIONS (cont.) : Linear differential equations with constant coefficients – special methods of finding particular integral – Linear equations with variable coefficients – Equations reducible to the linear homogeneous equations – Variation of parameters.

Vol III: Chapter 2 sections 2 to 4, 8 to 10

Unit – III

DIFFERENTIAL EQUATIONS (cont.) : Simultaneous equations of the first order and first degree – Methods for solving $dx/P=dy/Q=dz/R$ simultaneous linear differential equations with constant coefficients.

VOL III : Chapter 3 sections 1 to 6

Unit -IV

PARTIAL DIFFERENTIAL EQUATIONS: Derivation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Different integrals of partial differential equations - standard types of first order equations - Lagrange's equations.

Vol III: Chapter 4 ,Omit section 4, 5.5 and 7.0

Unit –V

LAPLACE TRANSFORMS: Laplace transforms – Definition – Transform of $f(t)$, - e^{at} , $\cos at$, $\sin at$ and t^n when n is an integer – Laplace transforms to solve ordinary differential equations with constant co-efficient.

Vol III Chapter 5

TEXT BOOK:

Calculus Vol III by T.K.Manicavachagam Pillay , S.Narayanan,S.Viswanathan Printers, 2007.

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Programme: B.Sc. Mathematics.

**Course Title : Core 4: TRIGONOMETRY, VECTOR CALCULUS
AND FOURIER SERIES**

Course Code: 13UMA2CO4

Year : First Year

Semester : II

Hours/Week : 5

Credits: 4

Unit -I

TRIGONOMETRY :Expansions of $\cos n\theta$, $\sin n\theta$, $\cos \theta$, $\sin \theta$, Hyperbolic functions – Separation of real and imaginary parts of Hyperbolic functions.

Chapter. III : Sec 1, 2, 5, Chapter. IV)

Unit -II

TRIGONOMETRY :Logarithms of Complex quantities – Summation of Trigonometric series.

Chapter. V: Sec 5, Chapter. VI

Unit III

VECTOR CALCULUS :Scalar and Vector point function – Differentiation of vectors – Directional derivative – gradient, divergence and curl.

Chapter 1 and Chapter 2

Unit -IV

VECTOR CALCULUS :Integration of vectors – line, surface and volume integrals – Integral theorems and their applications.

Chapter 3 and Chapter 4

Unit -V

FOURIER SERIES :Definition – finding Fourier coefficient for a given periodic function with period 2π – odd and even functions, Change of Interval.

Chapter VI: Sec 1, 2, 3 and 6

TEXT BOOK :

1. **Trigonometry by S. Narayanan and Manickavachagam Pillai**, S. Viswanathan (Printers and Publishers) PVT Ltd . For Units I and II.
2. **Vector Calculus by N. Namasivayam**, S. Viswanathan (Printers and Publishers) PVT Ltd. For Units III and IV.
3. **Calculus Vol III by T.K.Manicavachagam Pillay, S.Narayanan**, S.Viswanathan Printers, 2007. For Unit V.

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**For candidates admitted from academic year 2013-2014 onwards
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Programme :B.Sc.Mathematics.

**Course Title : Core 5 : ANALYTICAL GEOMETRY
OF 2D & 3D**

Year : Second Year

Hours/Week : 5

Course Code : 13UMA3C05

Semester : III

Credits : 4

Unit-I:

ANALYTICAL GEOMETRY OF 2D :Polar equation of a Conic – Directrix – Chord – Tangent – Normal - simple problems.

Chapter IX: Sections 9 – 13.

Unit-II:

ANALYTICAL GEOMETRY 3D :Direction Cosines – Direction Ratios – Planes – Equation of the plane passing through the points – Angle between the planes – Equation of the plane through the line of intersection of two given planes.

Chapter I: Sections 7 – 11 and Chapter II

Unit-III:

STRAIGHT LINE:Equation of the straight lines passing through two given points – Coplanarity of straight line-Shortest Distance (SD) and equation of SD between two lines-simple problems.

Chapter III: Sections 1, 2, 3, 4, 7, 8

Unit-IV:

SPHERE: Standard equation of Sphere - results based on the properties of a Sphere - Equation of circle on a Sphere - Equation of tangent plane to a Sphere.

Chapter IV

Unit-V:

CONE AND CYLINDER :Cone whose vertex is at the origin - right circular cone - Equation of a cylinder - right circular cylinder – Enveloping cylinder – Central quadrics.

Chapter V: Sections 1, 2, 8

TEXT BOOK :

- 1. Analytical Geometry – 2D by T.K. Manickavachagam Pillai & T. Natarajan, S. Viswanathan (Printers & Publishers), PVT., LTD, 2007. For Unit I.**
- 2. Analytical Geometry – 3D by T.K. Manickavachagam Pillai & T. Natarajan , S. Viswanathan (Printers & Publishers), PVT., LTD, 2001. For Units II,III, IV & V.**

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Programme :B.Sc. Mathematics.

Course Title : Core 6: STATICS

Year : Second Year

Hours/Week : 5

Course Code : 13UMA3C06

Semester : III

Credits : 4

Unit -I

KINEMATICS :Mechanics, Units, Vector and Scalar quantities, A vector as a sum of three mutually perpendicular vectors, A vector as a sum of two non – perpendicular vectors.

FORCES :Force, types of forces, magnitude and direction of the resultant of forces acting on a particle (in particular resultant of two forces acting on a particle), equilibrium examples.

EQUILIBRIUM OF A PARTICLE: Equilibrium of a particle acted on a rough inclined plane, examples.

Chapter. I Sec. 1-5, Ch. 2&6

Unit –II

FORCES ON A RIGID BODY : Moment of a vector, General motion of rigid body, equivalent or equipotent systems of forces, resultant of parallel forces, couple, resultant of several coplanar forces.

Chapter 7, Sec 7.1 – 7.6

Unit –III

Moment of the resultant force, couples in a plane or in parallel planes, resultant of a couple and a force, three coplanar forces on a rigid body, equation of the line of action of the resultant, equilibrium of a rigid body under three coplanar forces examples.

Chapter 7 ,Sec 7.7 – 7.12

Unit –IV

A SPECIFIC REDUCTION OF A SYSTEM OF FORCES :Reduction of a system of forces to a force at a chosen point and a couple, central axis, problems involving frictional force, problems involving tilting of bodies, examples.

Chapter 8.

Unit -V

STABILITY OF EQUILIBRIUM AND HANGING STRINGS:Equilibrium of a uniform homogeneous string, sag, suspension bridge, examples.

Chapter 10 &11

TEXT BOOK:

Mechanics by P.Duraipandian and others,S.Chand& Co., 1990.

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**For candidates admitted from academic year 2013-2014 onwards
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Programme : B.Sc. Mathematics.

**Course Title : Allied 3: MATHEMATICAL Course Code : 13UMA3AL3
STATISTICS I**

Year : Second Year Semester : III

Hours/Week : 6 Credits : 5

Unit –I

Random Variables- Mathematical Expectations.

Chapter 2: Sections 2.1 to 2.32

Chapter 3: Sections 3.1 to 3.18

Unit –II

Variance -Moments -Moment Generating Function - Conditional Expectation.

Chapter 4: Sections 4.1 to 4.25

Chapter 5: Sections 5.1 to 5.17

Chapter 7: Sections 7.1 to 7.9

Unit –III

Correlation (Omit Bivariate sample) – Regression

Chapter 8: Sections 8.1 to 8.51

Chapter 9: Sections 9.1 to 9.24

Unit –IV

Binomial Distribution – Poisson Distribution- Geometric Distribution.

Chapter 12: Sections 12.1 to 12.25

Chapter 13: Sections 13.1 to 13.21

Chapter 15

Unit –V

**Normal Distribution - Uniform Distribution - Exponential Distribution - Gamma
Distribution – Beta distribution.**

Chapters 16,17,18,19 and 20.

Text Book:

Mathematical Statistics by P.R. Vittal -Margham Publications, Chennai, 2004.

(Omit all Exercise Problems)

Reference Book:

**Fundamental of Mathematical Statistics by S.C. Gupta and V.K. Kapoor, Sultan
Chand & Sons, 2008.**

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Programme : B.Sc. Mathematics.

Course Title : Core 7: DYNAMICS

Year : Second Year

Hours/Week : 5

Course Code : 13UMA4C07

Semester : IV

Credits : 4

Unit –I

KINEMATICS :Velocity, resultant of \vec{v}_1 and \vec{v}_2 relative velocity acceleration, velocity and acceleration in a rectilinear motion, velocity and acceleration in a co-planar motion, angular velocity, rectilinear motion when the acceleration is constant, examples.

RECTILINEAR MOTION UNDER GRAVITY:Motion along a vertical line under gravity, line of quickest descent, motion along a smooth inclined plane, motion along a rough inclined plane, motion of connected particles, examples.

Chapter 1: Sec 1.6 to 1.15 Chapter 3: Sec 3.1 to 3.6

Unit -II

RECTILINEAR MOTION OF A PARTICLE UNDER VARYING FORCE

:Simple harmonic motion, Orthogonal projection of a uniform circular motion, composition of two simple harmonic motions of same period, motion of a heavy particle attached to one end of a horizontal spiral spring, motion of heavy particle attached to one end of a vertical spiral spring, motion under gravity in a resisting medium, examples.

Chapter 5: Sec 5.1 to 5.7

Unit -III

IMPACT :Impulsive force, Impulse, conservation of linear momentum, elasticity, Impact of two smooth spheres, direct impact of two smooth spheres, Impact of smooth sphere on a fixed smooth plane, Oblique impact between two smooth spheres, examples.

Chapter 12: Sec 12.1 to 12.9

Unit –IV

MOTION OF A PROJECTILE UNDER GRAVITY:Motion of projectile, Nature of a projectory, Results pertaining to the motion of a projectile, maximum horizontal range and speed of a projectile, examples.

Chapter 13: Sec 13.1 to 13.4, 13.6 to 13.11

Unit -V

CIRCULAR AND CYCLOIDAL MOTIONS:Conical pendulum, circular motion in a vertical plane under gravity, simple pendulum, cycloidal motion in a vertical plane, examples. **CENTRAL ORBITS** :Central force and central orbit, equation of a central orbit, law of force and speed for given orbit, determination of the orbit when the law of force is given.

Chapter 14: Sec 14.1 to 14.6 and Chapter 15: Sec 15.1 to 15.5

TEXT BOOK:

Mechanics by P.Duraipandian and others, S. Chand & Co., 1990.

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**For candidates admitted from academic year 2013-2014 onwards
Under New CBCS**

Programme : B.Sc. Mathematics.

Course Title : Core 8: NUMERICAL ANALYSIS

Course Code : 13UMA4C08

Year : Second Year

Semester : IV

Hours/Week : 5

Credits : 4

Unit -I

THE SOLUTION OF NUMERICAL, ALGEBRAIC AND TRANSCENDENTAL EQUATIONS:

Introduction – The Bisection method – Method of Successive Approximation or the Iteration method – The Method of False Position– Newton’s Iteration method.

SIMULTANEOUS LINEAR ALGEBRAIC EQUATIONS:

Introduction – Gauss Elimination method – Computation of the inverse of a matrix using Gauss’s Elimination method – Method of Triangularisation– Crout’s method – Iterative methods – Comparison of Gauss Elimination and Gauss-Seidal Iteration methods – Relaxation methods – examples.

Chapter – III & IV

Unit -II

FINITE DIFFERENCES: First Differences – Higher Differences – Backward

Differences – Central difference notation – Properties of the operator Δ - Differences of a polynomial – Factorial polynomials – Relation between the operators E and Δ - Relation between the operators (D) and Δ - other difference operators – Relationship between the operators – Examples.

Chapter – V

Unit –III

INTERPOLATION: Introduction – Linear Interpolation – Gregory Newton Forward Interpolation Formula – Gregory Newton Backward Interpolation Formula – Equidistant terms with one or more missing values. Central difference tables – Central Difference Interpolation Formulae – Gauss’s Forward Interpolation Formula - Gauss’s Backward Interpolation Formula – Stirling’s Formula – Bessel’s Formula – Lagrange’s Interpolation Formula – Examples.

Chapter –VI &VII

Unit -IV NUMERICAL DIFFERENTIATION AND INTEGRATION:

Newton’s Forward Difference Formula to compute the Derivatives – Newton’s Backward Difference Formula to compute the derivatives – Derivatives using Stirling’s formula – The Trapezoidal Rule – Truncation error in the Trapezoidal Formula – Romberg’s method – Simpson’s rule – Practical Applications of the Simpson’s rule – Examples.

Chapter –IX

Unit –V

NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS.

Solutions by Taylor’s series – Euler’s method – Improved Euler’s method – Modified

Euler's method – RungeKutta method – Second order RungeKutta method – Higher order RungeKutta method – Examples.

Chapter – X

TEXT BOOK:

Numerical Methods in Science and Engineering by Dr M.K. Venkataraman, The National Publishing Company, Fifth Edition, 1999.

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Programme :B.Sc. Mathematics.
Course Title : Allied 4: MATHEMATICAL STATISTICS II **Course Code : 13UMA4AL4**
Year : Second Year **Semester : IV**
Hours/Week : 6 **Credits : 5**

Unit –I

Sampling Distribution – Chi Square, t, F - Distributions.
Chapter 22: Sections 22.1 to 22.40

Unit –II

Estimation (Omit Cramer – Rao inequality and Rao-Blackwell Theorem).
Chapter 23: Sections 23.1 to 23.56

Unit –III

Large Samples.
Chapter 24: Sections 24.1 to 24.44

Unit –IV

Small Samples– t- test(Omit t-test for paired observation) – Small Samples – F test.
Chapter 25: Sections 25.1 to 25.39, Chapter 26: Sections 26.1 to 26.27

Unit-V

Small samples – Chi square Test – Design of experiments (Omit Factorial Experiments) – Test of Hypothesis.
Chapter 27: Sections 27.1 to 27.35, Chapter 28: Sections 28.1 to 28.17,
Chapter 29: Sections 29.1 to 29.6

Text Book:

Mathematical Statistics by Dr.P.R. Vittal - Margham Publications, Chennai, 2004.
(Omit all Exercise Problems)

Reference Book:

Fundamental of Mathematical Statistics by S.C. Gupta and V.K. Kapoor, Sultan Chand & Sons, 2008.

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Programme :B.Sc.Mathematics.

Course Title : Core 9 - MODERN ALGEBRA

Course Code :13UMA5C09

Year : Third Year

Semester : V

Hours/Week : 5

Credit : 5

Unit -I

PRELIMINARY NOTIONS: Set theory-Mappings – The Integers. **GROUP THEORY:** Definition of a Group- Some Examples of Groups-Some Preliminary Lemmas.

Chapter 1: Sections 1.1 to 1.3 and Chapter 2 : Sections 2.1 to 2.3.

Unit –II

GROUP THEORY: Subgroups – A Counting Principle- Normal Subgroups and Quotient Groups.

Chapter 2 : Sections 2.4 to 2.6.

Unit –III

GROUP THEORY: Homomorphisms – Automorphisms – Cayley’s Theorem- Permutation Groups.

Chapter 2 : Sections 2.7 to 2.10.

Unit –IV

RING THEORY: Definition and examples of rings- Some special classes of rings- Homomorphisms.

Chapter 3 : Sections 3.1 to 3.3.

Unit -V

RING THEORY: Ideals and Quotient Rings- More Ideals and Quotient Rings- The field of Quotients of an Integral Domain.

Chapter 3: Sections 3.4 to 3.6.

TEXT BOOK:

Topics in Algebra, by I.N. Herstein, Vani Educational Books a Division of Vikas Publishing House Pvt Ltd, New Delhi, 1984.

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Under New CBCS

Programme : B.Sc. Mathematics.

Course Title : Core 10 : REAL ANALYSIS – I

Course Code : 13UMA5C10

Year : Third Year

Semester : V

Hours/Week : 5

Credits : 5

Unit – I

The Real and complex number systems: Introduction – The field and order axioms – The unique factorization theorem for integers – rational and irrational numbers – upper bounds and the completeness axiom – the Archimedean property of the real number system – the Cauchy–Schwarz inequality. **Some basic notions of set theory:** Ordered pairs – relations and functions – sequences – similar sets – finite and infinite sets – countable and uncountable sets – countable collections of countable sets.

Chapter 1: Sections 1.1 to 1.19 and Chapter 2: Sections 2.1 – 2.15.

Unit -II

Elements of point set Topology: Introduction – Euclidean space \mathbb{R}^n – open balls and open sets in \mathbb{R}^n – The structure of open sets in \mathbb{R}^1 – closed sets – Adherent points. Accumulation points – closed sets and adherent points – the Bolzano – Weierstrass theorem – the Cantor intersection theorem – the Lindelof covering theorem – the Heine – Borel covering theorem – compactness in \mathbb{R}^n – metric spaces – point set topology in metric spaces – compact subsets of a metric spaces – boundary of a set.

Chapter 3 : Sections 3.1 to 3.16.

Unit –III

Limits and continuity: introduction – convergent sequence in a metric spaces – Cauchy sequences – complete metric spaces – limit of a function – continuous functions – continuity of composite functions – examples of continuous functions – continuity and inverse images of open or closed sets – functions continuous on compact sets.

Chapter 4: Sections 4.1 to 4.5, 4.8, 4.9, 4.11, 4.12, 4.13.

Unit –IV

Topological mappings (homeomorphisms) – Bolzano's theorem – connectedness – components of a metric space – uniform continuity – uniform continuity and compact sets – fixed point theorem for contractions – discontinuities of real – valued functions – monotonic functions.

Chapter 4 : Sections 4.14 to 4.17, 4.19 – 4.23.

Unit –V

Derivatives : Introduction – definition of derivative – derivatives and continuity – algebra of derivatives – the chain rule – Rolle's theorem – the mean value theorem for derivatives – intermediate – value theorem for derivatives – Taylor's formula with remainder – derivatives of vector – valued functions – partial derivatives.

Chapter 5 : Sections 5.1 to 5.5, 5.9 – 5.14.

TEXT BOOK:

Mathematical Analysis by Tom M. Apostol, Addison Wesley, 1974.

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS) COIMBATORE-641 020**

**For candidate admitted from academic year 2016-2017 onwards
under new CBCS**

Programme : B.Sc. Mathematics.

Course Title : core 11-COMPLEX ANALYSIS

Course Code : 16UMA5C11

Year : Third Year

Semester : V

Hours/Week: 5

Credits : 4

Unit- I

Analytic functions:

Complex functions - Limit of a function - Continuity of a function - Uniform Continuity - Differentiability and analyticity of a function – Necessary conditions for Differentiability - Sufficient conditions for Differentiability – C-R equations in polar coordinates

Chapter 4: Sections: 4.1-4.8

Unit- II

Elementary and Conformal mappings:

Bilinear transformation- Special bilinear transformation – Circles and inverse points –

Transformations $w = z^2$, $w = z^{\frac{1}{2}}$, $w = e^z$, Conformal mapping

Chapter 7: Sections: 7.1-7.6 & 7.8.

Unit- III

Complex Integration:

Simple rectifiable oriented curves – Integration of complex functions – Simple integrals using definition – Definite integrals – Interior and exterior of a closed curve – Simply-connected region – Cauchy's fundamental theorem using Goursat's lemma - Goursat's lemma (statement only) theorem 8.6 (statement only) – Integral along an arc joining two points, theorem 8.7 (statement only)- Cauchy's integral formula and formulas for derivatives , theorem 8.9, 8.10 (statements only), Morera's theorem.

Chapter 8: Sections: 8.1- 8.9.

Unit- IV

Complex Integration:

Zeros of a function – Related integral theorems, theorem 8.13-8.16 only.

Taylor's and Laurent's Series:

Taylor's series – Zeros of an analytic function – Laurent's series – Singular point or singularity – Isolated singularities – Removable singularity – Pole – Essential singularity.

Chapter 8: Sections: 8.10, 8.11.

Chapter 9: Sections: 9.1- 9.3, 9.5-9.9.

Unit-V

Residues:

Residue – Calculation of residues – Real definite integrals (types I, II, III only)

Chapter 10: Sections: 10.1-10.3.

Text Book:

Complex Analysis by P. Duraipandian, LaxmiDuraipandian and D. Muhilan,
M. D. Gopalakrishnan, Emerald Publishers, 2001.

References:

- 1. Complex Analysis by S. Narayanan and T. K. Manicavachagompillay,**
S. Viswanathan (Printers and Publishers), PVT. LTD. 1997.
- 2. Functions of a Complex Variable by J. N. Sharma.** Twenty Third Edition,
KrishnaPrakasanMandir PVT, Meerut, 1992-1993.

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

**For candidates admitted from academic year 2013-2014 onwards
Under New CBCS**

Programme : B.Sc. Mathematics.

Course Title : Core 12 – DISCRETE MATHEMATICS Course Code :13UMA5C12

Year : Third Year

Semester : V

Hours/Week : 4

Credits: 4

Unit – I

MATHEMATICAL LOGIC: Statements – Truth tables – Connectives – Normal forms.

Chapter 1: Sections 1.2.1 to 1.2.4, 1.2.6 to 1.2.11, 1.3.1 to 1.3.5.

Unit –II

MATHEMATICAL LOGIC: Predicate Calculus – Inference theory of Predicate Calculus.

Chapter 1: Sections 1.4.1 to 1.4.3, 1.5.1 to 1.5.5, 1.6.4, 1.6.5.

Unit –III

GRAMMAR AND AUTOMATA: Grammar and languages – Finite state acceptors and regular grammar.

Chapter 3: Sections 3.1, 3.3.2, Chapter 6: Sections 6.1, 6.2.

Unit –IV

LATTICE THEORY: Partial ordering – Posets – Hasse diagram – Lattices – Properties of Lattices – Boolean Algebra – Boolean Functions – Minimization.

Chapter 4: Sections 4.1.1, 4.1.2, 4.2 - 4.4

Unit –V

GRAPH THEORY: Introduction to Graphs – Matrix Representation of Graphs – Paths, Reachability, and Connectivity – Euler and Hamiltonian paths, Trees.

Chapter 5: Sections 5.1.1 to 5.1.4.

Text Book:

**Discrete Mathematical Structures with Applications to Computer Science by
J.P.Tremblay and R.Manohar, Tata McGraw Hill Book Edition, 1997.**

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

For candidates admitted from academic year 2013-2014 onwards

Under New CBCS

Programme :B.Sc.Mathematics.

Course Title : Core 13: OPERATIONS RESEARCH – I CourseCode :13UMA5C13

Year : Third Year

Semester : V

Hours/Week : 5

Credits : 4

Unit -I

THE LINEAR PROGRAMMING PROBLEM: Introduction – Mathematical Formulation of the Problem – Graphical Solution Method – Some Exceptional Cases – General Linear Programming Problem – Standard Form of LPP – Some important definitions. **THE SIMPLEX METHOD:** Introduction – The Computational procedure – Use of Artificial variables – Two Phase Method – Big-M Method.

Chapter 2 and Chapter 3.

Unit-II

DUALITY IN LINEAR PROGRAMMING: Introduction – General Primal-Dual pair – Formulating a Dual Problem – Duality and Simplex Method – Economic Interpretation of Dual – Dual Simplex Method. **INTEGER PROGRAMMING:** Introduction – Gomory's all LPP Method – Construction of Gomory's Constraints – Gomory's Fractional Cut Method – Geometrical Interpretation of the Cutting Plane.

Chapter 4 and Chapter 5.

Unit-III

THE TRANSPORTATION PROBLEM: Introduction – General Structure of the Problem – Basic Feasible Solution of a Transportation problem – The Transportation Tables – Loops in Transportation Tables – Solution of a Transportation problem – Finding Initial Basic Feasible Solution - Moving Towards Optimality – The Transportation Algorithm – Some exceptional cases.

Chapter 6.

Unit-IV

THE ASSIGNMENT PROBLEMS: The Assignment Problems – Mathematical Statement of the Problem – Method for Solving an Assignment Problem – Variations of the Assignment Problem – Travelling Salesman Problem.

Chapter 7.

Unit-V

SEQUENCING PROBLEMS: Introduction – Problem of Sequencing – Terminology, Notations and Assumptions – Problems with n Jobs and two Machines – Problems with n Jobs and three Machines – Problems with n Jobs and m Machines – Problems with two Jobs and m Machines. **DYNAMIC PROGRAMMING:** Introduction – Characteristics of Dynamic Programming – The Recursive Equation Approach – The Computational Procedure – An Application in Production – Solution of an L.P.P. by Dynamic Programming.

Chapter 8 and Chapter 9.

TEXT BOOKS: Introduction to Operations Research by KantiSwarup, P.K. Gupta and Man Mohan, Sultan Chand and Sons, Third Edition, 1997.

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

**For candidates admitted from academic year 2013-2014 onwards
Under New CBCS**

Programme : B.Sc. Mathematics.

Course Title : Core 14 - LINEAR ALGEBRA

Year : Third Year

Hours/Week : 5

Course Code : 13UMA6C14

Semester : VI

Credits : 5

Unit –I

MATRICES: Algebraic operations – Triangular, Diagonal, Scalar, Unit matrices – Transpose, adjoint and inverse of a square matrix – Symmetric and Skew Symmetric matrix.

Chapter 1: Sections 1.1 to 1.7.

Unit-II

Hermitian and Skew Hermitian Matrices-Orthogonal and Unitary Matrices:
Rank of a matrix - Eigen values and Eigen Vectors of linear operators – Solutions of Homogeneous linear equations, Solutions of non-homogeneous linear equations.
Characteristic roots and Characteristic vectors of a square matrix

Chapter 1: Sections 1.8 -1.9, Chapter 2: Section 2.9, Chapter 3: Sections 3.6 to 3.9.

Unit -III

VECTOR SPACES: Elementary basic concepts, linear Independence and bases

Chapter 4: Sections 4.1 to 4.2.

Unit –IV

Dual spaces – Inner product spaces

Chapter 4: Sections 4.3 and 4.4.

Unit –V

LINEAR TRANSFORMATIONS: Algebra of linear transformations – Characteristic roots – Matrices.

Chapter 6: Sections 6.1 to 6.3.

TEXT BOOKS

1. **A Text Book of Modern Algebra** by **R. Balakrishnan and N. Ramabhadran**, Vikas Publishing House Pvt Ltd, New Delhi, 1979.
(For Units I and II)
2. **Topics in Algebra**, by **I.N. Herstein**, Vani Educational Books a Division of Vikas Publishing House Pvt Ltd, New Delhi, 1984.
(For Units III, IV and V)

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

**For candidates admitted from academic year 2013-2014 onwards
Under New CBCS**

Programme : B.Sc. Mathematics.

Course Title : Core 15 - REAL ANALYSIS II

Course Code : 13UMA6C15

Year : Third Year

Semester : VI

Hours/Week : 5

Credits : 5

Unit -I

FUNCTIONS OF BOUNDED VARIATION AND RECTIFIABLE CURVES

:Introduction – properties of monotonic functions – Function of bounded variation – Total variation – Additive property of total variation – Total variation on $[a, x]$ as a function of x – Functions of bounded variation expressed as the difference of increasing functions – Continuous functions of bounded variation.

Chapter 6 : Sections 6.1 to 6.8.

Unit -II

THE RIEMANN – STIELTJES INTEGRAL :Introduction – Notation – The definitions of the Riemann-Stieltjes integral – Linear properties – Integration by parts – Change of Variable in a Riemann-Stieltjes integral – Reduction to a Riemann integral – Step functions as integrators.

Chapter 7 : Sections 7.1 to 7.8.

Unit -III

Reduction of a Riemann-Stieltjes integral to a finite sum – Eulers summation formula – monotonically increasing integrations, upper and lower integrals – Additive and linearity properties of upper and lower integrals – Riemann condition.

Chapter 7: Sections 7.9 to 7.13.

Unit -IV

INFINITE SERIES AND INFINITE PRODUCTS:Limit superior and limit inferior of a real-valued sequence – Monotonic sequences of real numbers – infinite series – inserting and removing parentheses – Alternating series – Absolute and conditional convergence – Double series – Rearrangement theorem for double series – A sufficient condition for equality of iterated series.

Chapter 8 : Sections 8.3 to 8.8, 8.20 to 8.23.

Unit –V

SEQUENCE OF FUNCTIONS:Pointwise convergence of sequences of functions – Examples of sequences of real-valued functions – Definition of uniform convergence – Uniform convergence and continuity – The Cauchy condition for uniform convergence – uniform convergence of infinite series of functions – uniform convergence and Riemann-Stieltjes integration – Non uniformly convergent sequences that can be integrated term by term – uniform convergence and differentiation – sufficient conditions for uniform convergence of a series – uniform convergence and double sequences.

Chapter 9: Sections 9.1 to 9.6, 9.8 to 9.12.

TEXT BOOK:

Mathematical Analysis by Tom M. Apostol, Addison Wesley, 1974.

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

**For candidates admitted from academic year 2016-2017 onwards
Under New CBCS**

Programme : B.Sc. Mathematics.
Course Title : Core 16– SPECIAL FUNCTIONS **Course Code : 16UMA6C16**
Year : Third Year **Semester : VI**
Hours/Week : 4 **Credits : 4**

Unit -I

Spherical Harmonics: Spherical Harmonics, Kelvin's theorem, Legendre's equation from Laplace equations, Bessel's equation from Laplace equations.

Legendre's equation: Legendre's equation, Solution of Legendre's equation, Definition of $P_n(x)$ and $Q_n(x)$, To show that $P_n(x)$ is the coefficient of h^n in the expansion of $(1 - 2xh + h^2)^{-1/2}$, Laplace Definite integral for $P_n(x)$, Orthogonal properties of Legendre's Polynomials, Recurrence formulae

Chapter 1: Sec: 1.1 – 1.4 and

Chapter 2: Sec: 2.1 – 2.8

Examples : Pg.No:20-26

Unit -II

HyperGeometric functions: Hypergeometric functions, Gauss's hypergeometric equation, The hyper geometric series, Particular cases of hypergeometric series, Different forms of hypergeometric function, Solution of hypergeometric equation, Linear relations between the solution of hypergeometric equation, Symmetric property of hypergeometric function, Integral formula for the hypergeometric function, Kummer's Theorem, Gauss's Theorem, Vandermonde's Theorem, Differentiation of hypergeometric function

Chapter 4: Sec: 4.1 – 4.13

Examples : Pg.No:91-95

Unit -III

Bessel's Equation: Bessel's equation, Solutions of Bessel's general differential equation, General solution of Bessel's equation, Integration of Bessel's equation in series for $n=0$, Definition of Bessel's Equation for series for $n=0$, Definition of $J_n(x)$, Recurrence formula for $J_n(x)$.

Chapter 5: Sec: 5.1 – 5.6.

Examples : Pg.No:107-113

Unit -IV

Hermite polynomials: Hermite's Differential equation , Solution of Hermite's equation, Hermite polynomials, Generating functions, Other forms for the Hermitepolynomials, To find the first few Hermite polynomials, Orthogonal properties of Hemite polynomials, Recurrence formulae for Hermite polynomials.

Chapter 6 : Sec 6.1-6.8

Examples : Pg.No:145-149

Unit -V

Chebyshev polynomials: Chebyshev's Differential equation, Chebyshev polynomial , To prove that $T_n(x)$ and $U_n(x)$ are independent solutions of Chebyshev's equation, Relations for $T_n(x)$ and $U_n(x)$, To find first few Chebyshev polynomials, Generating Functions , Orthogonal properties of Chebyshev polynomials, Recurrence for $T_n(x)$ and $U_n(x)$.

Chapter 8: Sec: 8.1 – 8.8.

Examples : Pg.No:180-182

TEXT BOOK:

Mathematical Methods (Part I) by J.N. Sharma, R.K. Gupta, Krishna PrakashanMandir, Edition 1990-91.

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

**For candidates admitted from academic year 2013-2014 onwards
Under New CBCS**

Programme :B.Sc.Mathematics.

Course Title : Core 17: OPERATIONS RESEARCH II CourseCode : 13UMA6C17

Year : Third Year

Semester : VI

Hours/Week : 5

Credits : 4

Unit –I

GAME THEORY :Introduction – Two-person Zero-Sum Games – The MaxiMin - MiniMax Principle – Games Without Saddle Points– Mixed Strategies - Graphical Solution of $2 \times n$ and $m \times 2$ Games – Dominance Property – Reducing the Game Problem to an LPP – A short-cut method for $n \times n$ Games.

Chapter 10

Unit –II

QUEUEING THEORY:Introduction – Queueing Systems – Characteristics of the Queueing Systems – Operating Characteristics of a Queueing System – Poisson Process and Exponential Distribution – Definition of Transient and Steady States - Classification of Queues – Poisson Queues.

Chapter 11 (Omit Sec 11.9)

Unit –III

INVENTORY PROBLEMS: Introduction – Inventory Control – Costs Associated with Inventories – Economic Lot Size Problems – Problems of EOQ with Shortage Allowed – Purchase Inventory Problem with Price Breaks – Multi-item Deterministic Problem – Buffer Stock or Safety Stock – Re-Order Level

Chapter 12 (Omit Sec 12.10)

Unit –IV

REPLACEMENT PROBLEM :Introduction - Replacement of items that deteriorate with time - Replacement of Items that fail completely

Chapter 13

Unit –V

NETWORK SCHEDULING BY PERT/CPM : Introduction – Basic Concepts – Construction of the Network – Critical Path Analysis – Statistical Considerations in PERT – Cost Considerations in PERT/CPM

Chapter 14

TEXT BOOK:

Introduction to Operations Research by KantiSwarup, P.K. Gupta and Man Mohan –Sultan Chand and Sons, Third Edition, 1997.

REFERENCE BOOK:

Resource Management Techniques by V. Sundaresan, K.S. Ganapathy Subramanian and K. Ganesan, A.R. Publications, Second Edition, 2004.

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

**For candidates admitted from academic year 2013-2014 onwards
Under New CBCS**

Programme :B.Sc. Mathematics.
Course Title : Core 18: ASTRONOMY **Course Code : 13UMA6C18**
Year : Third Year **Semester : VI**
Hours/Week : 5 **Credits : 4**

Unit -I

Celestial sphere – Diurnal motion.
Chapter II: Sections 39-84.

Unit -II

The zones of earth - Dip of horizon – **Twilight.**
Chapter III: Sections 87, 89, 96-99, 106-108, 111, 112.

Unit -III

Refraction – Geocentric Parallax.
Chapter VI: Sections 117-127, 129, 130, Chapter V: Sections 135-139.

Unit -IV

Kepler's laws
Chapter VI: Sections 146-164.

Unit -V

The Moon and Eclipses.
Chapter XII: Sections 229-255, Chapter XIII: Sections 256-275.

Omit all exercise problems

TEXT BOOK:

**Astronomy by S. Kumaravelu&N.SusheelaKumaravelu, Publisher S.
KumaraveluNagerkoil, Edition 8, 1990.**

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

For candidates admitted from academic year 2013-2014 onwards

Under CBCS

Programme : B.Sc., Physics and Chemistry.

Course Title : Allied Mathematics I

Course Code : 13UPH/13UCH1AL1

Year : First Year

Semester : II

Hours/Week : 6

Credits : 5

Unit –I

ALGEBRA: Statement of Binomial, Exponential and Logarithmic series – Approximation and limit expression obtained by Binomial, Exponential and Logarithmic series.

(Chapter 1: Section: 1.2, 1.3, 1.4 Omit summation problems)

THEORY OF EQUATIONS: Nature of Roots – Relation between the coefficients and the roots of an algebraic equation - Newton's and Horner's method.

(Chapter 2: Section: 2.1, 2.2, 2.6, 2.7)

Unit –II

MATRICES: Rank of a matrix – Simultaneous linear equations - **Eigen values and Eigen vectors** - Cayley-Hamilton Theorem (without proof) and its applications,

(Chapter 3: Section: 3.2 – 3.5)

Unit –III

FINITE DIFFERENCES: **Interpolation - Binomial method – Lagrange's interpolation.**

(Chapter 4: Section: 4.1 – 4.3) (Omit exercises)

Unit –IV

TRIGNOMETRY: Expansions of $\cos n\theta$, $\sin n\theta$ and $\tan n\theta$ – Expansion of $\sin \theta$ and $\cos \theta$ in a series of ascending powers of θ - Hyperbolic functions - Relation between Hyperbolic functions - Inverse Hyperbolic functions – Real and Imaginary parts - Logarithm of complex numbers.

(Chapter 5: Sections 5.1, 5.3 to 5.5)

Unit –V

DIFFERENTIAL CALCULUS:Curvature – Circle, radius and centre of curvature - Coordinates of centre of Curvature – Evolute and involute – Radius of Curvature in polar coordinates - p-r equation of the curve.

(Chapter 6: Section: 6.4)

TEXT BOOKS:

Ancillary Mathematics (Volume I) by S. Narayanan, R. Hanumantha Rao, Manickavachagam Pillai and P. Kandaswamy, S.Viswanathan (Printers & Publishers) Pvt Ltd., 2007.

References

1. G.C.Sharma and Madhu Jain, Algebra and Trigonometry, 1st Edition, Galgotia Publications Pvt.Ltd., 2003.

2. Dr.J.K.Goyal and G.P.Gupta, Laplace and Fourier Transforms, 16th Edition, PragatiPrakashan, Meerut, 2003.

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS), COIMBATORE – 641 020.**

For candidates admitted from academic year 2013-2014 onwards

Under CBCS

Programme : B.Sc., Physics and Chemistry.

Course Title : Allied Mathematics – II

Course Code : 13UPH/13UCH2AL2

Year : First Year

Semester : II

Hours/Week : 6

Credits : 5

Unit –I

INTEGRATION: Reduction formula

(Chapter 1: Section: 13)

FOURIER SERIES: Fourier series – Even and Odd functions – Half range Fourier series – Development in cosine series – Development in sine series.

(Chapter 2: Section: 1 – 5)

Unit –II

ORDINARY DIFFERENTIAL EQUATIONS: Variable separable- Homogenous equations - Non-Homogenous equations - Linear equations - Bernoulli's equations - First order higher degree equations.

(Chapter 4: **Omit Sections 6.1 - 6.4**)

Unit –III

PARTIAL DIFFERENTIAL EQUATIONS: Derivation of Partial differential equations- Eliminations of arbitrary constants / functions – Different integrals of partial differential equations – Four standard types of first order equations - Lagrange's equations

(Chapter 6: Section: 1 – 3, 5, 6)

Unit –IV

LAPLACE TRANSFORMS: Definition – Laplace transforms of standard functions – Inverse Laplace Transforms - Applications to solve ordinary differential equations and simultaneous equations

(Chapter 7)

Unit –V

VECTOR ANALYSIS: Vector differentiation – Gradient of a scalar point function – Divergence and Curl – Formula connecting Divergence and Curl – Vector integration – Line integral – Volume integral – Surface integral - Statement of Stoke's and Gauss theorem – Simple applications.

(Chapter 8: Sections: 1.11, 1.12, 1.17 to 1.20, 2, 4, 5, 6, 9)

TEXT BOOKS:

Ancillary Mathematics (Volume II) by S. Narayanan, R. Hanumantha Rao, Manickavachagam Pillai and P. Kandaswamy, S.Viswanathan (Printers & Publishers) Pvt Ltd., 2007.

Reference Books

1. Shanti Narayan, Differential Calculus, Shyamlal Charitable Trust, New Delhi, 2004.
2. B.M.Aggarwal, Integral Calculus, 1st Edition, Satya Prakashan Publishers, New Delhi, 1992.
3. P.N.Chatterji, Vector Calculus, 1st Edition, RajhansPrakahan Publishers, Chennai, 1998.

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

For candidates admitted from academic year 2013-2014 onwards

Under CBCS

Programme : B.Sc Electronics and Communication System

Course Title : Allied Mathematics II

Course Code : 13UEC2AL2

Year : First Year

Semester : II

Hours/Week : 6

Credits : 5

Unit - I: Differential Equations

Second Order Linear Differential Equations with constant Co-efficient – special method of finding particular integral.

Unit - II: Fourier Transforms

Definition of Fourier transforms – Properties of Fourier transforms- Fourier Cosine transform - Fourier sine transform - Parseval's Identity Convolution theorem - examples.

Unit - III: Numerical Methods

Solution of Simultaneous linear Algebraic Equations using Gauss Elimination Method – Gauss Jordan Method- Iterative Methods – Gauss Jacobi Method – Gauss Seidal Method - Numerical Integration - Trapezoidal Rule - Simpson's rule.

Unit - IV: Finite Differences & Numerical Differentiations

Newton's Forward and Backward Interpolations and examples - Newton's Forward and Backward difference – Stirling's formula and examples.

Unit - V: Measurements of Central Tendency

Arithmetic Mean-Direct, Step deviation method – Median, Quartiles (Individual, continuous series) - Mode- Geometric mean - Harmonic mean – Standard deviation co-efficient of dispersion, variations – Dispersion, Skewness.

Books for Study:

1. Calculus, Vol III – S.Narayanan and T.K.M. Pillai, Viswanathan Publishers, 2011.
2. Numerical Methods – Dr. P. Kandasamy, Dr. K. Thilagavathy and Dr. K. gunavathi, S. Chand Publishers, 2012.
3. Examples in Statistics - H.C. Saxena, Atmaram& Sons, Delhi, Seventh Edition (1989)

Reference Books:

1. M.K.Venkatraman, Numerical methods for Science and Engineering.
2. **Business Mathematics & Statistics, P.Navnitham, Jai Publishers, 2008.**

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

For candidates admitted from academic year 2013-2014 onwards

Under CBCS

Programme : B.Sc (CS), BCA, B.Sc (IT).

Course Title : Allied Mathematics I Course Code:13UCS/USC/UCA/UIT1AL1

Year : First Year

Semester : I

Hours/Week : 6

Credits : 5

UNIT I

Matrix: Basic Concepts – Properties- Inverse of Matrix – Rank of a Matrix- Eigen values and Eigen vectors -Determinants.

UNIT II

The solution of Numerical Algebraic and Transcendental equations – Bisection method – Method of Successive approximations – Regula -Falsi Method – Newton's method.

Simultaneous Linear Algebraic Equations: Gauss Elimination – Gauss Jordan Method – Method of Triangularization - Gauss Jacobi Method - Gauss Seidel Method.

UNIT III

Numerical Differentiation and Numerical Integration: Newton's forward difference, backward difference to compute the derivatives –Trapezoidal rule – Simpson's rule – Interpolation by Newton's and Lagrange's method, Runge – kutta method.

UNIT IV

Measures of central tendency: Arithmetic mean, Geometric Mean and Harmonic Mean, Median, Mode. Standard deviation, Co-efficient of variation.

UNIT V

Correlation -Pearson's co-efficient of Correlation – Rank Correlation – Regression – Linear Regression – Skewness, Kurtosis.

TEXT BOOKS:

- 1. P.Kandasamy, K.Thilakavathy, K.Gunavathy, Numerical methods, 2003 Edition.**
(Unit I, II and III).
- 2. Statistics, RSN. Pillai &Bhagavathi, Sultan Chand Publishers, reprint 2002**
(Unit-IV&V).

REFERENCE BOOKS:

- 1. M.K.Venkatraman Numerical methods for Science and Engineering.**
- 2. Business Mathematics & Statistics, P.Navnitham, Jai Publishers,2008. (Unit IV, V)**

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

For candidates admitted from academic year 2013-2014 onwards

Under CBCS

Programme : B.Sc (CS), BCA, B.Sc (IT).

Course Title : Allied Mathematics II Course Code : 13UCS/USC/UCA/UIT2AL2

Year : First Year

Semester : II

Hours/Week : 6

Credits : 5

UNIT I

Mathematical Logic: Connectives, Negation, conjunction, Disjunction, Truth tables, Conditional and biconditional, well-formed formulas, tautologies, equivalence, duality. Tautological implications.

UNIT II

Normal forms: Disjunctive, Conjunctive, Principal Disjunctive, Principal Conjunctive. Predicates Calculus: Predicates, variables, quantifiers, free and bound variables.

Inference theory: Predicate Calculus.

UNIT III

Formal languages and Automata: Regular expressions, types of grammar, regular grammar, context free and context sensitive grammars, finite automata.

UNIT IV

Probability: Mathematical Preliminaries-Permutation and Combination- Baye's Theorem (without Proof) – Problems in Probability.

UNIT V

Theoretical Distributions: Binomial – Poisson – Normal distributions

TEXT BOOK:

1. **J.P.Tremblay and R.P.Manohar, Discrete Mathematical structures with Applications to Computer science,** TATA McGraw Hill. (Unit I, II and III).
2. **Statistics, RSN. Pillai & Bhagavathi,** Sultan Chand Publishers, reprint 2002. (Unit-IV&V).
3. **Business Mathematics & Statistics, P.Navnitham,** Jai Publishers, 2008.

REFERENCE BOOK:

1. **V.Sundaresan, K.S.Ganapathy Subramanian, K. Ganesan. Discrete Mathematics.**
2. **Statistics for Commerce Students, Gupta S.P.**

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

For candidates admitted from academic year 2013-2014 onwards

Under CBCS

Programme : B.ComCoop, CA , B.Com

Course Title : Allied Mathematics I Course Code : 13UCO3AL3/13UCC/UCM1AL1

Year : First Year

Semester : I

Hours/Week : 6

Credits : 5

UNIT – I

Set Theory: Types of sets- Set Operations – Laws and properties of Sets- De Morgan's laws- Applications to business and economic problems.

UNIT – II

Simple and Compound Interest – Effective rate and nominal rate of interest - Annuities – Discounting, Equated Monthly installment(EMI)

UNIT – III

Statistics: Concepts - Scope, uses, functions and limitations of Statistics – Collection of Data – Primary and Secondary Data sources – Types of Sampling – Classification, Tabulation and interpretation.

UNIT-IV

Measures of central tendencies: Arithmetic Mean, Median and Mode, Geometric mean Harmonic mean.

UNIT-V

Measures of Dispersion: Range, Mean deviation, Quartile deviation, Standard deviation, Co-efficient of variation.

TEXT BOOK:

1. **Business Mathematics & Statistics, P. Navnitham**, Jai Publishers, 2008.
(Unit- I&II)
2. **Statistics, RSN. Pillai & Bhagavathi**, Sultan Chand Publishers, reprint 2002.
(Unit- III,IV&V)

REFERENCE BOOKS:

1. **Business Mathematics and Statistics, Dr. P.R.Vittal**, Margam Publishers, 2002.

**SRI RAMAKRISHNA MISSION VIDYALAYA COLLEGE OF ARTS
AND SCIENCE (AUTONOMOUS) COIMBATORE – 641 020.**

For candidates admitted from academic year 2013-2014 onwards

Under CBCS

Programme : B.ComCoop, CA, B.Com

Course Title : Allied Mathematics II Course Code : 16UCO4AL4/13UCC/UCM1AL1

Year : First Year

Semester : II

Hours/Week : 6

Credits : 5

UNIT – I

Matrix: Basic Concepts – Addition and Multiplication of Matrices–Properties-
Inverse of Matrix – Rank of a Matrix.

UNIT – II

Linear Programming Problem: Formulation - Solutions by Graphical Method ,
Simplex method: feasible solution, unbounded solution, infeasible solution. .

UNIT – III

Correlation: Meaning and definition – Scatter diagram – Pearson’s co-efficient of
Correlation – Rank Correlation – Regression – Linear Regression – Simple problems.

Unit -IV

Time Series Analysis: Definition, Uses, Components of Time Series Analysis,
Measurement of Secular Trend: Graphic Method, Semi average Method, Moving
average Method, Method of least squares.

Unit -V

Index Numbers: Definition, Characteristics, Uses, Types and Methods, Cost of
Living Index: Growth Rate and Growth Index, Choice Based Index Numbers, Chain
Base Index Numbers, limitations.

TEXT BOOKS:

1. **Business Mathematics & Statistics, P.Navnitham**, Jai Publishers, 2008.
(Unit- I&II)
2. **Statistics, RSN. Pillai &Bhagavathi**, Sultan Chand Publishers, reprint 2002.
(Unit- III,IV&V)

REFERENCE BOOKS:

1. **Statistics for Commerce Students, Gupta S.P**