SRI A.S.N.M. GOVERNMENT COLLEGE (A), PALAKOL

Department of Mathematics

B.Sc(MATHEMATICS)-2023-2024

(FOR MPC, MPCs, MCCs, Single Major Mathematics) Syllabus

EMPLOYABILITY	
ENTREPRENEURSHIP	
SKILL DEVELOPMENT	

SRI A.S.N.M. GOVERNMENT COLLEGE (A), PALAKOL

WEST GODAVARI DISTRICT, ANDHRA PRADESH- 534260

SEMESTER-I, MATHEMATICS

COURSE 1: ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL ANDCHEMICAL SCIENCES

Theory	Credits: 4	5 hrs/week
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Course Objective:

The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences. The course aims to develop students' critical thinking, problem-solving, and analytical skills in these areas, enabling them to apply scientific principles to real-world situations.

Learning outcomes:

1. Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures.

2. To Explain the basic principles and concepts underlying a broad range of fundamentalareas of physics and to Connect their knowledge of physics to everyday situations

3. To Explain the basic principles and concepts underlying a broad range of fundamentalareas of chemistry and to Connect their knowledge of chemistry to daily life.

4. Understand the interplay and connections between mathematics, physics, and chemistry invarious applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.

5. To explore the history and evolution of the Internet and to gain an understanding of network security concepts, including threats, vulnerabilities, and countermeasures.

UNIT I: ESSENTIALS OF MATHEMATICS:

Complex Numbers: Introduction of the new symbol i – General form of a complex number – Modulus-Amplitude form and conversions

Trigonometric Ratios: Trigonometric Ratios and their relations – Problems on calculation of

angles Vectors: Definition of vector addition - Cartesian form - Scalar and vector product and

problems **Statistical Measures:** Mean, Median, Mode of a data and problems

UNIT II: ESSENTIALS OF PHYSICS:

Definition and Scope of Physics- Measurements and Units - Motion of objects: Newtonian Mechanics and relativistic mechanics perspective - Laws of Thermodynamics and Significance- Acoustic waves and electromagnetic waves- Electric and Magnetic fields and their interactions- Behaviour of atomic and nuclear particles- Wave-particle duality, the uncertainty principle- Theories and understanding of universe.

UNIT III: ESSENTIALS OF CHEMISTRY:

Definition and Scope of Chemistry- Importance of Chemistry in daily life -Branches of chemistry and significance- Periodic Table- Electronic Configuration, chemical changes, classification of matter, Biomolecules- carbohydrates, proteins, fats and vitamins.

UNIT IV: APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY:

Applications of Mathematics in Physics & Chemistry: Calculus , Differential Equations & Complex Analysis

Application of Physics in Industry and Technology: Electronics and Semiconductor Industry, Robotics and Automation, Automotive and Aerospace Industries, Quality Control and Instrumentation, Environmental Monitoring and Sustainable Technologies.

Application of Chemistry in Industry and Technology: Chemical Manufacturing, Pharmaceuticals and Drug Discovery, Materials Science, Food and Beverage Industry.

UNIT V: ESSENTIALS OF COMPUTER SCIENCE:

Milestones of computer evolution - Internet, history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications.

Ethical and social implications: Network and security concepts- Information Assurance Fundamentals, Cryptography-Symmetric and Asymmetric, Malware, Firewalls, Fraud Techniques- Privacy and Data Protection

SRI A.S.N.M. GOVERNMENT COLLEGE (A), PALAKOL

SEMESTER-I, MATHEMATICS

COURSE 2: ADVANCES IN MATHEMATICAL, PHYSICAL AND CHEMICALSCIENCES

Theory

Credits: 4

5 hrs/week

Course Objective:

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences. The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

Learning outcomes:

1. Explore the applications of mathematics in various fields of physics and chemistry, to understand how mathematical concepts are used to model and solve real-world problems.

2. To Explain the basic principles and concepts underlying a broad range of fundamental areasof physics and to Connect their knowledge of physics to everyday situations.

3. Understand the different sources of renewable energy and their generation processes and advances in Nanomaterials and their properties, with a focus on quantum dots. To study the emerging field of quantum communication and its potential applications. To gain an understanding of the principles of biophysics in studying biological systems. Explore the properties and applications of shape memory materials.

3. Understand the principles and techniques used in computer-aided drug design and drug delivery systems, to understand the fabrication techniques and working principles of nanosensors. Explore the effects of chemical pollutants on ecosystems and human health.

4. Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.

5 Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal. Differentiate between analog and digital signals and understand their characteristics.Gain knowledge of different types of transmission media, such as wired (e.g., copper cables, fiber optics) and wireless (e.g., radio waves, microwave, satellite)..

UNIT I: ADVANCES IN BASICS MATHEMATICS

Straight Lines: Different forms – Reduction of general equation into various forms – Point of intersection of two straight lines

Limits and Differentiation: Standard limits – Derivative of a function –Problems on product ruleand quotient rule

Integration: Integration as a reverse process of differentiation – Basic methods of integration

Matrices: Types of matrices – Scalar multiple of a matrix – Multiplication of matrices – Transpose of a matrix and determinants

UNIT II: ADVANCES IN PHYSICS:

Renewable energy: Generation, energy storage, and energy-efficient materials and devices. **Recent advances in the field of nanotechnology**: Quantum dots, Quantum Communication-recent advances in biophysics- recent advances in medical physics- Shape Memory Materials.

UNIT III: ADVANCES IN CHEMISTRY:

Computer aided drug design and delivery, nano sensors, Chemical Biology, impact of chemical pollutants on ecosystems and human health, Dye removal - Catalysis method

UNIT IV: ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY

Mathematical Modelling applications in physics and chemistry

Application of Renewable energy: Grid Integration and Smart Grids,

Application of nanotechnology: Nanomedicine,

Application of biophysics: Biophysical Imaging, Biomechanics, Neurophysics,

Application of medical physics: Radiation Therapy, Nuclear medicine

Solid waste Management, Environmental remediation- Green Technology, Water treatment.

UNIT V: Advanced Applications of computer Science

Number System-Binary, Octal, decimal, and Hexadecimal, Signals-Analog, Digital, Modem, Codec, Multiplexing, Transmission media, error detection and correction- Parity check and CRC, Networking devices- Repeater, hub, bridge, switch, router, gateway.

SRI A.S.N.M. GOVERNMENT COLLEGE(A), PALAKOL. W.G.DT

(Affiliated to Adikavi Nannaya University, Rajahmahendravaram) (Accredited with NAAC "B⁺" Grade with 2.67 CGPA) I B.Sc Mathematics (w.e.f 2023-24) **Paper III, Syllabus for II semester**

Differential Equations

UNIT - I: (12 Hours)Differential equations of first order and first degree

Bridge Course- Basics of Differential equations and Integration (No question to be given from this portion)

Linear differential equations; Differential equations reducible to linear form; Exact differential equations; Integrating factors.

UNIT – II (12 Hours) **Differential Equations of first order but not of the first degree :**

Equations solvable for p, Equations solvable for y, Equations solvable for x, Equations homogenious in x and y, Equations of the first degree in x and y- Clairaut's Equation.

UNIT-III: (12 Hours) Higher order linear differential equations I

Solution of homogeneous linear differential equations of order n with constant coefficients; Solution of the non-homogeneous linear differential equations with constant coefficients by means of polynomial operators.

General Solution of f(D)y=0

General Solution of f(D)y=Q, where Q is a function of x.

 $\frac{1}{f(D)}$ is Expressed as partial fractions.

P.I. of f(D)y = Q when $Q = be^{ax}$

P.I. of f(D)y = Q when $Q = b \sin ax$ or $b \cos ax$.

UNIT-IV: (12 Hours) Higher order linear differential equations II

Solution of the non-homogeneous linear differential equations with constant coefficients.

P.I. of f(D)y = Q when $Q = bx^k$

P.I. of f(D)y = Q when $Q = e^{ax}V$, where V is a function of x.

P.I. of f(D)y = Q when Q = xV, where V is a function of x.

P.I. of f(D)y = Q when $Q = x^m V$, where V is a function of x.

UNIT-V: (12 Hours) Higher order linear differential equations III

Method of Variation of Parameters; Linear Differential Equations with Non-Constant Coefficients, The Cauchy-Euler equation, Legendre's linear equations.

ADDITIONAL INPUT: Orthogonal trajectories

Prescribed Text Book: (1) A Text Book of B.Sc Mathematics Volume-I (S.Chand & Company) (V.Venkateswara Rao, N.Krishnamurthy, B.V.S.S.Sarma, S.Anjaneya Sastry)

Reference Books: (1) Ordinary and Partial Differential Equations Raisinghania, published by

S. Chand & Company, New Delhi.

(2) Differential Equations with applications and programs – S. Balachandra Rao & HR Anuradha- universities press.

(3) Differential Equations and Their Applications by Zafarpublished by Prentice-Hall of India Learning Pvt. Ltd. New Delhi-

Second edition. <u>Suggested Activities:</u>Seminar/ Quiz/ Assignments

SRI A.S.N.M. GOVERNMENT COLLEGE(A), PALAKOL. W.G.DT (Affiliated to Adikavi Nannaya University, Rajahmahendravaram) (Accredited with NAAC "B⁺ Grade with 2.67 CGPA) I B.Sc Mathematics (w.e.f 2023-24) Paper IV, Syllabus for II semester Analytical Solid Geometry

UNIT – I (12 hrs) : The Plane :

Equation of plane in terms of its intercepts on the axis, Equations of the plane through the given points, Length of the perpendicular from a given point to a given plane, Bisectors of angles between two planes, Combined equation of two planes, Orthogonal projection on a plane.

UNIT – II (12 hrs) : The Line :

Equation of a line; Angle between a line and a plane; The condition that a given line may lie in a given plane; The condition that two given lines are coplanar; Number of arbitrary constants in the equations of straight line; Sets of conditions which determine a line; The shortest distance between two lines; The length and equations of the line of shortest distance between two straight lines; Length of the perpendicular from a given point to a given line.

<u>UNIT – III (12 hrs) : Sphere :</u>

Definition and equation of the sphere; Equation of the sphere through four given points; Plane sections of a sphere; Intersection of two spheres; Equation of a circle; Sphere through a given circle; Intersection of a sphere and a line; Power of a point; Tangent plane; Plane of contact; Polar plane; Pole of a Plane; Conjugate points; Conjugate planes.

<u>UNIT – IV(12 hrs):Sphere&Cones :</u>

Angle of intersection of two spheres; Conditions for two spheres to be orthogonal; Radical plane; Coaxial system of spheres; limiting points.

Definitions of a cone; vertex; guiding curve; generators; Equation of the cone with a given vertex and guiding curve; Equations of cones with vertex at origin are homogenous; Condition that the general equation of the second degree should represent a cone; Condition that a cone may have three mutually perpendicular generators.

UNIT – V (12 hrs) Cones:

Enveloping cone of a sphere, Right circular cone, Equation of the right circular cone with a given vertex; axis and semi-vertical angle. Condition that a cone may have three mutually perpendicular generators. Intersection of a line and a quadric cone; Tangent lines and tangent plane at a point; Condition that a plane may touch a cone; Reciprocal cones; Intersection of two cones with a common vertex.

Prescribed Text Book: (1) A Text Book of B.Sc Mathematics Volume-I (S.Chand & Company)

(V.Venkateswara Rao, N.Krishnamurthy, B.V.S.S.Sarma, S.Anjaneya Sastry)

Reference Books :

- **1.** Analytical Solid Geometry by Shanti Narayan and P.K. Mittal, Published by S. Chand & Company Ltd. 7th Edition.
- **2.** A text Book of Analytical Geometry of Three Dimensions, by P.K. Jain and Khaleel Ahmed, Published by Wiley Eastern Ltd., 1999.
- **3.** Co-ordinate Geometry of two and three dimensions by P. Balasubrahmanyam, K.Y. Subrahmanyam, G.R. Venkataraman published by Tata-MC Gran-Hill Publishers Company Ltd., New Delhi.

Suggested Activities: Seminar/ Quiz/ Assignments / Group discussins

SRI A.S.N.M. GOVERNMENT COLLEGE (A), PALAKOL. W.G.DT (Affiliated to Adikavi Nannaya University, Rajahmahendravaram) (Accredited with NAAC B⁺ Grade with 2.67 CGPA)

II B.Sc Mathematics (w.e.f 2020-21A.Y.) Paper III, Syllabus for III semester Abstract Algebra

UNIT – 1 : (10 Hrs) Groups

Binary Operation – Algebraic structure – semi group-monoid – Group definition and elementary properties Finite and Infinite groups – examples – order of a group. Composition tables with examples.

UNIT – 2 : (14 Hrs) Subgroups, Co-Sets and Lagrange's Theorem

Complex Definition – Multiplication of two complexes Inverse of a complex-Subgroup definition – examples-criterion for a complex to be a subgroups.

Criterion for the product of two subgroups to be a subgroup-union and Intersection of subgroups.

Cosets Definition – properties of Cosets–Index of a subgroups of a finite groups–Lagrange's Theorem.

UNIT -3 : (12 Hrs) Normal Subgroups

Definition of normal subgroup – proper and improper normal subgroup–Hamilton group – criterion for a subgroup to be a normal subgroup – intersection of two normal subgroups – Sub group of index 2 is a normal sub group – simple group – quotient group – criteria for the existence of a quotient group.

UNIT-4 Homomorphism:

Definition of homomorphism – Image of homomorphism elementary properties of homomorphism – Isomorphism – automorphism definitions and elementary properties–kernel of a homomorphism – fundamental theorem on Homomorphism and applications.

Permutation Group:

Definition of permutation – permutation multiplication – Inverse of a permutation – cyclic permutations – transposition – even and odd permutations – Cayley's theorem.

UNIT – 5 : (14 Hrs) Rings:

Definition of Ring and basic properties, Boolean Rings, divisors of zero and cancellation laws Rings, Integral Domains, Division Ring and Fields, The characteristic of a ring - The characteristic of an Integral Domain, The characteristic of a Field. Sub Rings.

Prescribed Text Book: A Text Book of B.Sc Mathematics Volume-II (S.Chand & Company)

(V.Venkateswara Rao, N.Krishnamurthy, B.V.S.S.Sarma, S.Anjaneya Sastry)

Reference Books :

1. A. First course in Abstract Algebra, by J.B. Fraleigh Published by Narosa Publishinghouse.

2. Modern Algebra by M.L. Khanna.

Suggested Activities: Seminar/ Quiz/ Assignments /Group discussions/project works

SRI A.S.N.M. GOVERNMENT COLLEGE(A), PALAKOL. W.G.DT (Affiliated to Adikavi Nannaya University, Rajahmahendravaram) (Accredited with NAAC B⁺ Grade with 2.67 CGPA) II B.Sc Mathematics (w.e.f 2021-22) Paper IV, Syllabus for IV semester

Real Analysis

UNIT - I (12 hrs) : REAL NUMBERS

The algebraic and order properties of R, Absolute value and Real line, Completeness property of R, Applications of supreme property; intervals. (**No. Question is to be set from this portion**)

Real Sequences (10 Marks-2, 5 Marks-2)

Sequences and their limits, Range and Boundedness of Sequences, Limit of a sequence and Convergent sequence.

The Cauchy's criterion, properly divergent sequences, Monotone sequences, Necessary and Sufficient condition for Convergence of Monotone Sequence, Limit Point of Sequence, Subsequences and the Bolzano-weierstrass theorem – Cauchy Sequences – Cauchy's general principle of convergence theorem.

UNIT -II (12 hrs) : INFINITIE SERIES

Series : Introduction to series, convergence of series. Cauchy's general principle of convergence for series tests for convergence of series, Series of Non-Negative Terms.

1. P-test

2. Canchy's nth root test or Root Test.

3. D-Alembert's Test or Ratio Test.

4. Alternating Series – Leibnitz Test.

Absolute convergence and conditional convergence, semi convergence.

UNIT – III (12 hrs) : CONTINUITY

Limits : Real valued Functions, Boundedness of a function, Limits of functions. Some extensions of the limit concept, Infinite Limits. Limits at infinity. (**No. Question is to be set from this portion**)

Continuous functions : Continuous functions, Combinations of continuous functions, Continuous Functions on intervals, uniform continuity.

UNIT - IV (12 hrs) : DIFFERENTIATION & MEAN VALUE THEOREMS

The derivability of a function on an interval at a point, Derivability and continuity of a function, Graphical meaning of the Derivative, Mean value Theorems; Rolle's Theorem, Lagrange's Theorem, Cauchy's Mean value Theorem.

UNIT – V (12 hrs) : RIEMANN INTEGRATION

Riemann Integral, Riemann integral functions, Darboux theorem. Necessary and sufficient condition for R – integrability, Properties of integrable functions, Fundamental theorem of integral calculus, First mean value theorem.

REFERENCE TEXT BOOKS :

- **1.** "Introduction to Real Analysis" by RABERT g BARTELY and .D.R. SHERBART Published by John Wiley.
- **2.** Elements of Real Analysis on per UGC Syllabus by Shanthi Narayan and Dr. M.D. Raisinghania Published by S. Chand & Company Pvt. Ltd., New Delhi.

Suggested Activities: Seminar/ Quiz/ Assignments /Group discussions/project works

SRI A.S.N.M. GOVERNMENT COLLEGE (A), PALAKOL. W.G.DT (Affiliated to Adikavi Nannaya University, Rajahmahendravaram) (Accredited with NAAC B⁺ Grade with 2.67 CGPA)

II B.Sc Mathematics (w.e.f 2021-22) Paper V, Syllabus for IV semester LINEAR ALGEBRA

<u>UNIT – I (12 hrs) : Vector Spaces-I</u>

Vector Spaces, General properties of vector spaces, n-dimensional Vectors, addition and scalar multiplication of Vectors, internal and external composition, Null space, Vector subspaces, Algebra of subspaces, Linear Sum of two subspaces, linear combination of Vectors, Linear span Linear independence and Linear dependence of Vectors.

UNIT -II (12 hrs) : Vector Spaces-II

Basis of Vector space, Finite dimensional Vector spaces, basis extension, co-ordinates, Dimension of a Vector space, Dimension of a subspace, Quotient space and Dimension of Quotientspace.

UNIT –III (12 hrs) : Linear Transformations

Linear transformations, linear operators, Properties of L.T, sum and product of LTs, Algebra of Linear Operators, Range and null space of linear transformation, Rank and Nullity of linear transformations – Rank – Nullity Theorem.

UNIT -IV (12 hrs) : Matrix(10Marks-2, 5Marks-1)

Linear Equations, Characteristic Roots, Characteristic Values & Vectors of square Matrix, Cayley – Hamilton Theorem.

UNIT -V (12 hrs) : Inner product space(10Marks-2, 5Marks-2)

Inner product spaces, Euclidean and unitary spaces, Norm or length of a Vector, Schwartz inequality, Triangle in Inequality, Parallelogram law, Orthogonality, Orthonormal set, complete orthonormal set, Gram – Schmidt orthogonalisation process. Bessel's inequality and Parseval's Identity.

ADDITIONAL INPUT: Vector Space Isomorphism

Prescribed Text Books:

(1) A Text Book of B.Sc Mathematics Volume-III (S.Chand & Company)

(V.Venkateswara Rao, N.Krishnamurthy, B.V.S.S.Sarma, S.Anjaneya Sastry)

Reference Books :

- Linear Algebra by J.N. Sharma and A.R. Vasista, published by Krishna Prakashan Mandir, Meerut- 250002.
- 2. Matrices by Shanti Narayana, published by S.Chand Publications.
- 3. Linear Algebra by Kenneth Hoffman and Ray Kunze, published by Pearson Education (low priced edition), New Delhi.
- 4. Linear Algebra by Stephen H. Friedberg et al published by Prentice Hall of India Pvt. Ltd. 4th Edition 2007.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on "Applications of Linear algebra Through Computer Sciences"

SRI A.S.N.M. GOVERNMENT COLLEGE(A), PALAKOL. W.G.DT

(Affiliated to Adikavi Nannaya University, Rajahmahendravaram) (Accredited with NAAC B⁺ Grade with 2.67 CGPA)

> III B.Sc Mathematics (w.e.f 2022-23) Syllabus for V semester Course-6A: Numerical Methods

Unit – 1: Finite Differences and Interpolation with Equal intervals

- 1. Introduction, Forward differences, Backward differences, Central Differences, Symbolic relations, nth Differences of Some functions,
- 2. Advancing Difference formula, Differences of Factorial Polynomial, Summation ofSeries.
- 3. Newton's formulae for interpolation. Central Difference Interpolation Formulae.

Unit – 2: Interpolation with Equal and Unequal intervals

- 1. Gauss's Forward interpolation formulae, Gauss's backward interpolation formulae, Stirling'sformula, Bessel's formula.
- 2. Interpolation with unevenly spaced points, divided differences and properties, Newton's divided differences formula.
- 3. Lagrange's interpolation formula, Lagrange's Inverse interpolation formula.

Unit – 3: Numerical Differentiation (15h)

- 1. Derivatives using Newton's forward difference formula, Newton's back ward difference formula,
- 2. Derivatives using central difference formula, Stirling's interpolation formula,
- 3. Newton's divided difference formula, Maximum and minimum values of a tabulated function

Unit – 4: Numerical Integration (15h)

- 1. General Quadrature formula one errors, Trapezoidal rule,
- 2. Simpson's1/3– rule, Simpson's 3/8 rule, and Weddle's rules,
- 3. Euler Maclaurin Formula of summation and quadrature, The Euler transformation.

Unit – 5: Numerical solution of ordinary differential equations (15h)

- 1. Introduction, Solution by Taylor's Series,
- 2. Picard's method of successive approximations,
- 3. Euler's method, Modified Euler's method, Runge Kutta methods.

(15h)

SRI A.S.N.M. GOVERNMENT COLLEGE(A), PALAKOL. W.G.DT (Affiliated to Adikavi Nannaya University, Rajahmahendravaram) (Accredited with NAAC B⁺ Grade with 2.67 CGPA) III B.Sc Mathematics (w.e.f 2022-23) Syllabus for V semester Course-7A: Mathematical Special Functions

Unit – 1: Beta and Gamma functions, Chebyshev polynomials

- 1. Euler's Integrals-Beta and Gamma Functions, Elementary properties of Gamma Functions, Transformation of Gamma Functions.
- 2. Another form of Beta Function, Relation between Beta and Gamma Functions.
- 3. Chebyshev polynomials, orthogonal properties of Chebyshev polynomials, recurrence relations, generating functions for Chebyshev polynomials.

Unit – 2: Power series and Power series solutions of ordinary differential equations (15h)

- 1. Introduction, summary of useful results, power series, radius of convergence, theorems on Power series
- 2. Introduction of power series solutions of ordinary differential equation
- 3. Ordinary and singular points, regular and irregular singular points, power series solution.

Unit – 3: Hermite polynomials

- 1. Hermite Differential Equations, Solution of Hermite Equation, Hermite polynomials, generating function for Hermite polynomials.
- 2. Other forms for Hermite Polynomials, Rodrigues formula for Hermite Polynomials, to find first few Hermite Polynomials.
- 3. Orthogonal properties of Hermite Polynomials, Recurrence formulae for Hermite Polynomials.

Unit – 4: Legendre polynomials

- 1. Definition, Solution of Legendre's equation, Legendre polynomial of degree n, generating function of Legendre polynomials.
- 2. Definition of $P_n(x)$ and $Q_n(x)$, General solution of Legendre's Equation (derivations not required) to show that Pn(x) is the coefficient of h^n , in the expansion of of $(1 2xh + h^{2})^{\frac{-1}{2}}$
- 3. Orthogonal properties of Legendre's polynomials, Recurrence formulas for Legendre's Polynomials.

(15h)

(15h)

(15h)

Unit – 5: Bessel's equation

- 1. Definition, Solution of Bessel's equation, Bessel's function of the first kind of order n, Bessel's function of the second kind of order n.
- 2. Integration of Bessel's equation in series form=0, Definition of $J_n(x)$, recurrence for mulae for $J_n(x)$.
- 3. Generating function for $J_n(x)$, orthogonally of Bessel functions. ADDITIONAL INPUT: Rodrigue's formula and its applications

SRI A.S.N.M. GOVERNMENT COLLEGE(A), PALAKOL. W.G.DT (Affiliated to Adikavi Nannaya University, Rajahmahendravaram) (Accredited with NAAC B⁺ Grade with 2.67 CGPA) LIFE SKILL COURSE - ANALYTICAL SKILLS <u>Syllabus, For all Degree Programmes.</u> Semester – III (w.e.f. 2021-22)

(Total 30 Hrs)

Course Objective: Intended to inculcate quantitative analytical skills and reasoning as an inherent ability in students.

Course Outcomes:

After successful completion of this course, the student will be able to;

- 1) Understand the basic concepts of arithmetic ability, quantitative ability, logical reasoning, business computations and data interpretation and obtain the associated skills.
- 2) Acquire competency in the use of verbal reasoning.
- 3) Apply the skills and competencies acquired in the related areas
- 4) Solve problems pertaining to quantitative ability, logical reasoning and verbal ability inside and outside the campus.

UNIT – I :

Arithmetic ability: (10 Questions)

Algebraic operations BODMAS, Fractions, Divisibility rules, LCM & GCD (HCF).

Verbal Reasoning : (10 Questions)

Number Series, Coding & Decoding, Blood relationship, Clocks, Calendars.

UNIT – II :

Quantitative aptitude (10 Questions)

Averages, Ratio and proportion, Problems on ages, Time-distance - speed.

Business computations (10 Questions)

Percentages, Profit &loss, Partnership, simple compound interest.

UNIT – **3**:

Data Interpretation: (2 Questions)

Tabulation, Bar Graphs, Pie Charts, Line Graphs, Venn diagram.

Reference Books:

- 1. Quantitative Aptitude for Competitive Examination by R S Agrawal, S.Chand publications.
- 2. Quantitative Aptitude and Reasoning by R V Praveen, PHI publishers.
- 3. Quantitative Aptitude : Numerical Ability (Fully Solved) Objective Questions, Kiran Prakashan, Pratogitaprakasan, Kic X, Kiran Prakasan publishers
- 4. Quantitative Aptitude for Competitive Examination by Abhijit Guha, Tata Mc Graw hill publications. Old question Paper of the exams conducted by (Wipro, TCS, Infosys, Etc) at their recruitment process, source-Internet.

SRI A.S.N.M. GOVERNMENT COLLEGE(A), PALAKOL. W.G.DT (Affiliated to Adikavi Nannaya University, Rajahmahendravaram) (Accredited with NAAC B⁺ Grade with 2.67 CGPA) SKILL ENHANCEMENT COURSE - ANALYTICAL SKILLS <u>Syllabus, For all Degree Programmes.</u> Semester – I (w.e.f. 2023-24)

(Total 30 Hrs)

Course Objective: Intended to inculcate quantitative analytical skills and reasoning as an inherent ability in students.

Course Outcomes:

After successful completion of this course, the student will be able to;

- 1) Understand the basic concepts of arithmetic ability, quantitative ability, logical reasoning, business computations and data interpretation and obtain the associated skills.
- 2) Acquire competency in the use of verbal reasoning.
- 3) Apply the skills and competencies acquired in the related areas
- 4) Solve problems pertaining to quantitative ability, logical reasoning and verbal ability inside and outside the campus.

UNIT – I :

Arithmetic ability: (10 Questions)

Algebraic operations BODMAS, Fractions, Divisibility rules, LCM & GCD (HCF).

Verbal Reasoning : (10 Questions)

Number Series, Coding & Decoding, Blood relationship, Clocks, Calendars.

UNIT – II :

Quantitative aptitude (10 Questions)

Averages, Ratio and proportion, Problems on ages, Time-distance – speed.

Business computations (10 Questions)

Percentages, Profit &loss, Partnership, simple compound interest.

UNIT – 3:

Data Interpretation: (2 Questions)

Tabulation, Bar Graphs, Pie Charts, Line Graphs, Venn diagram.

Reference Books:

- 1. Quantitative Aptitude for Competitive Examination by R S Agrawal, S.Chand publications.
- 2. Quantitative Aptitude and Reasoning by R V Praveen, PHI publishers.
- 3. Quantitative Aptitude : Numerical Ability (Fully Solved) Objective Questions, Kiran Prakashan, Pratogitaprakasan, Kic X, Kiran Prakasan publishers
- 4. Quantitative Aptitude for Competitive Examination by Abhijit Guha, Tata Mc Graw hill publications. Old question Paper of the exams conducted by (Wipro, TCS, Infosys, Etc) at their recruitment process, source-Internet.