CURRICULUM

B.SC. (PMCS)

B. Sc. PMCS - Semester – I

S. No.	Course Code	Title of the Course	Credit Hrs.		
			L	T	P
1	PHY – 331	MECHANICS	3	1	0
2	PHY – 333	THERMAL PHYSICS	3	1	0
3	MAS – 321	DIFFERENTIAL EQUATIONS & VECTOR CALCULAS	3	0	0
4	MAS – 322	DIFFERENTIAL & INTEGRAL CALCULUS	3	0	0
5	MAS – 323	REAL ANALYSIS- I	3	0	0
6	CSIT – 405	FUNDAMENTALS OF COMPUTER SCIENCE	3	1	2
7	CSIT – 404	PROBLEM SOLVING & PROGRAMMING IN C	3	1	4
8	GPT-301	MORAL & VALUE EDUCATION	3	0	0
9	NSS-318	NATIONAL SERVICE SCHEME	Non Credit Course		

B. Sc. PMCS - Semester – II

S. No.	Course Code	Title of the Course	Credit Hrs.		
			L	T	P
1	PHY – 334	WAVES & OSCILLATIONS	3	1	0
2	PHY – 336	ELECTROMAGNETISM	3	1	0
3	MAS – 351	REAL ANALYSIS – II	3	0	0
4	MAS – 352	ALGEBRA – I	3	0	0
5	MAS – 353	3D COORDINATE GEOMETRY	3	0	0
6	CSIT – 407	ALGORITHMS & DATA STRUCTURES THROUGH C	3	1	1
7	CSIT – 517	COMPUTER ARCHITECTURE	3	1	0
8	PHY – 330	PHYSICS LAB. – I	0	0	4
9	LNG – 301	STRUCTURE & SPOKEN ENGLISH	2	0	2
10	NSS-327	NATIONAL SERVICE SCHEME	Non Credit Course		

B. Sc. PMCS - Semester – III

S. No.	Course Code	Title of the Course	Credit Hrs.		
			L	T	P
1	PHY – 431	ATOMIC & NUCLEAR PHYSICS	3	1	0
2	PHY – 433	OPTICS	3	1	0
3	MAS – 421	LINEAR ALGEBRA – I	3	0	0
4	MAS – 424	GROUP THEORY	3	0	0
5	MAS – 423	STATICS	3	0	0
6	CSIT – 425	OBJECT ORIENTED SYSTEMS AND C++	3	0	2
7	CSIT – 417	FUNDAMENTALS OF OPERATING SYSTEM	3	0	2
8	NSS-413	NATIONAL SERVICE SCHEME	Non Credit Course		

B. Sc. PMCS - Semester – IV

S. No.	Course Code	Title of the Course	Credit Hrs.		
			L	T	P
1	PHY – 434	MODERN OPTICS	3	1	0
2	PHY – 436	STATISTICAL PHYSICS & ASTROPHYSICS	3	1	0
3	MAS – 451	LINEAR ALGEBRA - II	3	0	0
4	MAS – 452	NUMERICAL ANALYSIS	3	0	0
5	MAS – 453	DYNAMICS	3	0	0
6	CSIT – 605	JAVA PROGRAMMING	3	1	1
7	CSIT – 505	RELATIONAL DATABASE MANAGEMENT SYSTEM	2	1	1
8	PHY – 430	PHYSICS LAB. – II	0	0	4
9	NSS-414	NATIONAL SERVICE SCHEME	Non Credit Course		

B. Sc. PMCS - Semester – V

S.No.	Course Code	Title of the Course	Credit Hrs.		
			L	T	P
1	PHY – 531	QUANTUM MECHANICS	3	1	0
2	PHY – 533	ELECTRONICS – I	3	0	0
3	MAS – 524	RING THEORY	3	0	0
4	MAS – 525	METRIC SPACE	3	0	0
5	MAS – 553	OPTIMIZATION TECHNIQUES	3	0	0
6	CSIT – 610	DATA COMMUNICATIONS AND NETWORKING	2	1	2
7	CSIT – 416	SYSTEM ANALYSIS AND DESIGN	2	1	0
8	ENV – 415	ENVIRONMENTAL STUDIES – I	2	0	0
9	NSS-516	NATIONAL SERVICE SCHEME	Non Credit Course		

B. Sc. PMCS - Semester – VI

S.No.	Course Code	Title of the Course	Credit Hrs.		
			L	T	P
1	PHY – 532	SOLID STATE PHYSICS	3	1	0
2	PHY – 534	ELECTRONICS – II	3	0	0
3	PHY – 530	PHYSICS LAB – III	0	0	4
4	MAS – 551	PARTIAL-DIFFERENTIAL EQUATIONS	3	0	0
5	MAS – 552	NUMBER THEORY	3	0	0
6	MAS – 554	TENSORS AND SPACE GEOMETRY	3	0	0
7	CSIT – 601	LINUX AND SHELL PROGRAMMING	3	1	1
8	CSIT – 504	INTERNET AND WEB TECHNOLOGIES	3	0	2
9	ENV– 416	ENVIRONMENTAL STUDIES – II	2	0	0
10	MAS-699	PROJECT WORK	5	0	0
11	NSS-527	NATIONAL SERVICE SCHEME	Non Credit Course		

Course Title: MECHANICS

B.Sc. PCM/ PMCS/ PCFS

Semester-I

Course Code: PHY-331 **Credit Hrs: (3-1-0)**

Unit-1: Vectors Analysis

Integrals (line, surface and volume), Physical significance of Gradient, Divergence and curl, statement of Gauss's and Stroke's theorems.

Unit-2: Frame of References and Relativity.

Frame of reference, inertial frames of reference, Galilean transformations, postulates of special theory of relativity, Lorentz transformations, consequences of Lorentz transformations, Relativistic mass, Relativistic energy, Mass energy relation.

Unit-3: Dynamics of Rigid Bodies,

Angular momentum and moment of inertia, Theorem on moment of inertia, central forces, conservative and non-conservative forces.

Unit-4: Fluid Mechanism,

Ideal fluids, Equation of Continuity, Viscous fluids, critical velocity, Derivation of Poiseuille's Equation.

Reference books:

1. An introduction to Mechanics
   Kleppner, Tata McGraw Hills
2. Mechanics
   J.C. Upadhyay
3. Mechanics and thermodynamics
   Basavaraju & Ghosh; Tata McGraw Hills
4. Mechanics
   B.S Agarwal
5. Mechanics
   D.S Mathur
6. Mechanics
   J.C Upadhyay

Course Title: THERMAL PHYSICS
B. Sc. PCM/ PMCS/PCFS
Semester-I

Course Code: PHY-333 **Credit Hrs: (3-1-0)**

Unit-1: Basic concepts and 1st law of Thermodynamics

Thermodynamic systems, Thermal equilibrium and Zeroth law of thermodynamics, concept of temperature, 1st law and its applications, indicator diagram, Reversible and irreversible process.

Unit-2: 2nd law of Thermodynamics and Entropy.

Carnot's engine and Carnot's Cycle, 2nd law of thermodynamics, Carnot's theorem, entropy, change of entropy in a reversible and irreversible processes. Temperature-entropy diagram.

Unit-3: Thermodynamics Relationships.

Clausius-Clayperon's equation, second latent heat equation, Triple point, Thermodynamic potentials and their relations with thermo dynamical variables.

Unit-4: Thermal conduction.

Fundamental equation of heat conduction, propagation of heat wave in an insulated rod with end heated sinusoidal (periodic flow of heat), propagation of temperature waves in the earth's crust.

References books:

1. Thermal Physics,
   B.K. Agarwal; Lokbaharti Publications.
2. Heat thermodynamics
   D.S. Mathur and M.N. Bapat; Sultan Chand book window.
3. Heat and thermodynamics
   Mark W Zemansky; Tata McGraw Hills.
4. Mechanics and thermodynamics
   Basavaraju and Ghosh; Tata McGraw Hills.
5. Heat, Thermodynamics &Statistical Physics,
   Satya Prakash
6. Heat & Thermodynamics
   Brij Lal & Subrahmanyam
7. Heat Thermodynamics & Statistical Physics
   Singhal, Agarwal, S.P
8. Heat & Thermodynamics
   Zemansky/Dittmann

B.Sc. (PCM/PMCS) Semester- I

Course Name: Differential Equations & Vector Calculus

Course Code: MAS - 321 **Credit: 3-0-0**

Equations of first order & first degree, general & particular solutions, equations in which variables separable, homogeneous equations, reducible forms, linear equations, reducible forms, exact differential equations, Integrating- factors.

Equations of first order & but not of the first degree, Clairaut- Equations. Geometrical -interpretation, linear equations with constant coefficient, Particular- integrals.
Special methods.

Homogeneous linear differential equations.

Vector Differentiation, Point Function, Partial Derivatives, Gradient, Divergence & Curl.
Line & Surface Integral, Gauss-Theorem, Green-Theorem & Stokes- Theorem.

Reference Books:
1. Differential-Calculus: Gorakh-Prasad
2. Integral-Calculus: Gorakh-Prasad
3. A Course in Vector Analysis with Applications: Mata Ambar Tiwari & R S Sengar

B.Sc. (PCM/PMCS) Semester- I
Course Name: Differential & Integral Calculus

Course Code: MAS-322 **Credit : 3-0-0**

Differential- Calculus:

Successive differentiation, nth order derivative, Leibnitz theorem, Maclaurin theorem, Taylor theorem & concerned problems, partial derivatives, total differential coefficient, Euler- theorem, application of p RTIl derivatives in errors, approximations, maxima – minima etc. Jocobians Curvature, Indeterminate-forms, Expansion of functions of two variables.

Integral- Calculus : Properties of definite- integrals & their applications reduction formulae, Multiple-integrals & their applications. Gamma & Beta functions & their applications Change of order of integration.

Reference Books: 1. Differential & Integral Calculus: Gorakh- Prasad.
2. Calculus (Vol I & II): T M Apostol

B.Sc. (PCM\PMCS) SEMESTER-I

Course Name: Real Analysis I

Course Code: MAS-323 **Credit: 3-0-0**

Real number system: Natural number, Peano's postulates for natural numbers, The first principle of induction, Ordered relation and Well ordering property of the set N, Second principle of induction, Integers, [Embedding of natural numbers in Z, Division Algorithm theorem, Euclidean Algorithm, Unique factorization theorem for integers](without proof), Rational and Irrational numbers, Axioms of real number, The field axioms, The order axioms, The Archimedian-principle, rational density theorem, irrational density theorem, bounds of a set, The completeness axiom.

Sequence: Sequence of a real numbers, Finite and Infinite sequences, Bounded sequence, monotonic sequence and Cauchy sequence, Limit of a sequence, Convergence and Divergence of a sequence, Cauchy's general principle of convergence, Cauchy's theorems on limits.

Series: Infinite-series, Tests for convergence. Cauchy's general principle of convergence of series, Series of +ve terms, Comparison theorem, Comparison test, D' Alembert ratio test, Raabe-test, Logarithmic test, De-Morgan test, Bertand test, Cauchy root–Test, Cauchy Condensation Test, Absolute and conditional convergence, Uniform convergence, Cauchy criterion for uniform convergence, Tests for uniform convergence of series, term by term integration, term by term differentiation, The integral test for convergence.

Reference Books:

1. Real Analysis- John M. Howie
2. Principles of Mathematical Analysis Walter –Rudin.
3. Sequence and series- K. K. Azad and Kavita Srivastava.
4. Mathematics Analysis- Somusundaram and B. Chodhury.

Semester – I

Course Title: FUNDAMENTALS OF COMPUTER SCIENCE

L	T	P
4 (2	1	2)

Course Code: CSIT – 405

UNIT-1

Introduction to Computers: Need and Role of computers, Definition, Characteristics and Applications, Generations of Computer, Hardware: Basic block diagram, CPU, Primary and Secondary storage devices and I/O Devices.

UNIT-2

Information Concepts: Data and its representation, Information and its characteristics, Categories of information, Levels of information. Data storage and retrieval. Concept of file, record and field.

Number System: Basic concepts, Binary, Octal, Decimal, and Hexadecimal numbering system, conversion from one system to another.

UNIT-3

Introduction to Software: Definition, Types of Software, System software: Operating System, Functions of OS, Overview of DOS, Windows and Linux.
Application software: Word Processor, MS-Excel. Database concepts, Flat file versus Database.

UNIT-4

Computer Languages: Definition, Generations of computer languages, Types of Languages, Language Translators: Assembler, Interpreter, Compiler, Linker and Loader. Programming constructs, Algorithm & flowchart.

UNIT-5

Computer Network Concepts: Introduction to Computer Networks, History and usage of Internet, Browser and its types, Domain Name System (DNS), WWW, Electronic Mail (e-mail) , Search Engines and Intranets**.**

Text Book:

P.K. Sinha & P. Sinha, "Foundation of Computing", BPB
Chanchal Mittal, "Computer and Languages with C", Pragati Prakashan

References:

V. K. Jain, "Fundamentals of IT and Computer Programming", Katson Books
S. Sagman, "Microsoft Office 2000 for Windows", Pearson
Yashavant P. Kanetkar "Unix Shell Programming", BPB

Semester – I
Course Title: FUNDAMENTALS OF COMPUTER SCIENCE
Course Code: CSIT – 405

Practical List:

1. **DOS commands:**
   Internal DOS Commands: MD, CD, DIR, TIME, DATE, DEL, TYPE, EDIT, COPY, EXIT, PATH, PROMPT, REM, REN, VER.
   External Dos Commands: ATTRIB, BACKUP, CHKDSK, COMP, DEBUG, DISKCOPY, DOSKEY, HELP, XCOPY, SHUTDOWN, SYSTEMINFO, UNDELETE.

2. Working with Windows Operating System.

3. Working with **MS-Word**:
   -Getting familiar with various tool bars.
   -Tables and Columns
   -Mail merge
   MS-Excel:
   -Working with Spreadsheets
   -Generating Charts
   -Creating Macros
   MS-PowerPoint:
   -Preparation/Presentation of Slides

4. **Exploring Internet:** WebPages, Website, Browser, URL, Surfing, Searching, creating mail accounts.

5. **Basic Linux Commands:** LS, DF, RM, PASSWD, CAL, DATE, TOUCH, FILE, CUT, CAT, WHO, VI, MORE, CLEAR, CP, MV, MKDIR, CD, RMDIR. EXIT, ED.

Semester – I
Course Title: PROBLEM SOLVING & PROGRAMMING IN C

Course Code: CSIT – 405 **Credits: 5(2+1+4)**

Unit – I

Introduction: History of 'C' language, Algorithms and Flowcharts, Developing algorithm and flowchart for simple problems.
'C' basics: character set, Identifiers & keywords, Data types, Constants, Variables, Operators, Symbolic constants, Expressions, Compound statements, Structure of C program. Input and Output Statements.

Unit – II

'C' constructs: if statements & its forms, goto statement, while statement, for statement, do…while statement, break and continue statement, nesting concepts, switch statement.

Unit – III

Arrays: definition, types of Arrays, declaring Arrays, i/o operations on Arrays.
Functions: basics of functions, applications, function declaration, definition, scope, parameter passing and recursion.

Unit – IV

Pointers: definition, applications of pointers: pointer to Arrays, call by reference in functions.
Character Handling: Strings, standard library string functions, and two-dimensional array of characters, array of pointers to strings.

Unit-V

Structures: basics of Structures, Structure and Functions, pointers to structures, union.
File handling: file concepts, file creation, I/O operations on files, file functions, working with text files

TEXT:

1. Yeshwant Kanetkar, "Let us C", BPB Publications, 2002
2. B. Kernighan & D. Ritchie, " The ANSI C programming Language", PHI, 2000

REFERENCES:

1. E. Balaguruswamy, "Programming in ANSI C", TMH, 1999
2. AI Kelly and Ira Pohl, " A Book in C", (4th Edition), Addison Wesley, 1999.
3. R.G. Dromey, "How to solve it by computer", PHI, 1992

Semester-I
Course Title: MORAL & VALUE EDUCATION
B. Sc. (PCM/ PCFS/ PMCS/ LSCFS/ ZBC)

Course Code: GPT-301 **Credit Hrs.3-0-0**

OBJECTIVES

- To explicitly discuss that is implicitly communicated through Academic disciplines.
- To inculcate Life affirming values based on 'Fear of God as the beginning of wisdom'.
- To focus on specific values in decision making process.

Section I – BASICS

- Integrating 'Heart-Head-Hand' – Story of Sam Higginbottom.
- 'Contextual – Dialogical – Praxiological' character of value education.
- Different Values: Academic – Economic – Social – Material – Moral – Spiritual.

Section II – Biblical Foundation

- Proverbs — Chapter 2 – 4
- Ten Commandments — Exodus 20: 1 – 17
- Two Commandments of Jesus — Mark 12: 29 – 31
- Sermon on Mount — Matthew chapter 5 – 7
- Lord's Prayer — Matthew 6: 9 – 13, Luke 11: 1 – 4
- Parable of Good Samaritan — Luke 10: 29 – 37
- Parable of Two Brothers — Luke 15: 11 – 32

Section III – Formation of Character

- Voice of Conscience
- Virtues — Prudence – Justice – Courage – Discipline – Success – Faith – Hope – Love
- Values of Life — Marriage – No same-sex marriage – Divorce – Abortion
- Values of Belonging — Family - Friends – Faith Community – Nation – World

Section IV – God – Human – Plants – Animals

- Stewardship of Creation
- Biotechnological Advancement
- Exploitation of Animals & Plants & Micro-Organisms
- Environmental Hazards

Section V – Our Constitution

- Fundamental Rights
- Directive Principles of State Policy
- Fundamental Duties
- Enlightened Citizenship: Ten points of Dr. A. P. J. Kalam

Section VI – Interactive Sessions

- Sexual Harassment
- Corruption
- Substance Abuse
- Violence
- Communalism
- Cyber crime

Course Title: WAVES AND OSCILLATIONS
B.Sc. PCM/ PMCS/PCFS
Semester-II

Course Code: PHY-334 **Credit Hrs: (3-1-0)**

Unit-1: Simple Harmonic Motion.

Sample harmonic motion and harmonic oscillator, Maclaurine series and expansion for harmonic oscillator. Education of motion of harmonic Oscillator and its solution,Energy of harmonic oscillator, Examples of harmonic oscillator- Simple pendulum, extended spring, U-tube, torssion pendulum, Helmholtz resonator and LCR circuit.

Unit-2 Anharmonic Oscillator and composition of SHMs.

Anharmonic oscillator, equation of motion and its solution, compound pendulum (detail study), Determination of 'g', composition of two SHMs of equal periods (Lissajous figures) and with periods in ratio 1:2.

Unit-3: Damped oscillations, forced oscillation and Resonance.

Damping force, damped oscillator, Equation of motion and its solution, power dissipation, Q factor. Examples of Damped harmonic oscillators, forced oscillations, Equation of motion and its solution. Resonance, LCR circuit, power in AC circuit and RMS value.

Unit-4: Wave motion.

General wave equation, De-Broglie hypothesis and uncertainty principle, particle, wave and group velocity, progressive plane wave solution, Longitudinal wave motion in strings, waves in liner bounded medium, flow of energy in stationary states.

Reference books:

1. The Physics of waves and Oscillations
   Bajaj, Tata McGraw Hills.
2. Waves and Oscillations
   Brijlal and Subrahmanyam.
3. Waves
   Frank S Crawford
4. Physics of Vibration & Waves
   H. J. Pain
5. Oscillation & Waves
   Satya Prakash
6. Physics of Vibration & Waves
   H.J. Pain
7. Waves & Oscillation
   Subrahmanyam / Brij Lal

Course Title: ELECTROMAGNETISM
B.Sc. PCM/ PMCS/PCFS
Semester-II

Course Code: PHY-336 **Credit Hrs: (3-1-0)**

Unit-1: Electric field and potential.

Vector form of Coulomb's law, Electric field and potential, Poisson's and Laplace equation .Gauss's law and its application for calculation of electric field due to spherical, cylindrical, linear and flat sheet charge distributions, charged soap bubble, Energy of ionic crystal, Method of electrical images for conducting plane only.

Unit-2: Magnetostatics.

Definition of magnetic field by Biot-Savart's law, Field due to circular Coil, Helmholtz coil and solenoid. Energy stored in magnetic field, line integral of magnetic field, Curl and Divergence of magnetic field, Ampere's theorem, Earth's magnetism, Tangent galvanometer, Magnetic materials and their classification, Langevin's theory of para and diamagnetic materials, field due to magnetised matter, Hysteresis loss and cycle.

Unit-3: Electromagnetic Induction.

Faraday's experiment, Lenz's law conducting rod moving through uniform Magnetic field, law's of electromagnetic induction, Eddy currents, Mutual inductance, Mutual inductance of solenoid, Maxwell's Equation, Basic concept of electromagnetic waves and its solution in free space. EM propagation through free space, Poynting theorem

Unit-4: Varying currents.

Currents through CR and LR circuits, High resistance by leakage, Alternating and Direct current, Analysis of LC and LCR circuits using complex number representation, Resonance, Q factor, Kirchoff's law and its application to AC circuits, Anderson's, Owen's and De-Dauty's bridges, Transformer and choke coil.

References:

1. Electricity Principles and Application
   Fowler; Tata McGraw Hills.
2. Electricity and Magnetism
   Mahajan; Tata McGraw Hill.
3. Electromagnetic Waves and Radiating systems
   Jordan Balman
4. Electricity and Magnetism
   K.K. Tewari

B.Sc. (PCM/ PMCS/PCFS)
Semester–II

Course Title: PHYSICS LAB. – I

Course Code: PHY-330 **Credit Hrs: 0-0-4**

List of Experiments

1. To determine the Moment of Inertia of a Flywheel about its axis of rotation.
2. To determine the value of (g) with the help of a compound pendulum.
3. To determine Young's Modulus of the given material in the form of a beam.
4. To determine the Modulus of Rigidity of the material of a given wire and Moment of Inertia of an irregular body with the help of Torsion Table.
5. To determine the Poisson's ratio for rubber.
6. To determine the force constant of the given spring and to verify that the force constant of a parallel combination of spring is equal to the algebraic sum of the force constants of the individual springs.
7. To determine the surface tension of the given liquid by capillary rise method.
8. To determine the surface tension of a liquid by Jaeger's method.
9. To determine the viscosity of a liquid by poiseuille's method.
10. To determine the Modulus of Rigidity of a given material in the form of a wire by Statistical Method (Horizontal Pattern).
11. To determine the Modulus of Rigidity of a given material in the form of a wire by Statistical Method (Vertical Pattern).
12. To determine the thermal conductivity of a non-metalic solid (Bad conductor) by Lee's disc method.
13. To determine the coefficient of thermal conductivity of a metal using Searle's apparatus.
14. To determine the value of Stefan constant.
15. To determine mechanical equivalent of heat *J* by mechanical method.
16. To determine the value of *J* with the help of Joule's calorimeter.
17. To determine the value of γ for air by Clement and Desorme's.
18. To determine the frequency of tuning fork by sonometer.

B.Sc. (PCM\PMCS) Semester – II
Course Name: Real Analysis II

Course Code: MAS-351 **Credit: 3-0-0**

Functions- Concept of limit, theorem on limits & evaluations of limits, Indeterminate forms, Continuity of a function, types of discontinuities & properties, Bolzano's theorem, Intermediate value theorem & Differentiability, algebra of derivatives, chain rule for differentiation, derivative of inverse function, Intermediate value theorem for differentiability, successive differentiation, Leibnitz's theorem, Maclaurin's theorem, Taylor's theorem, Rolle's theorem, Lagrange's theorem, Cauchy's theorem, deduction of Lagrange's theorem from Cauchy's theorem, general Mean-Value Theorem.

Maxima and Minima: Maximum, minimum value, conditions of maxima and minima, critical point, stationary point, test for maximum and minimum values.

Reference Books:

1. Real Analysis- John M. Howie
2. Mathematics Analysis: Somusundaram and B. Chodhury
3. Principles of Mathematical Analysis Walter –Rudin

B. Sc. (PCM/PMCS) Semester – II
Course Name: Algebra I

Course Code: MAS 352 **Credit 3-0-0**

Language of Mathematics, Prepositional connectives, Quantifiers, Tautology & logically equivalences, Set, subset, Ordered pair, Cartesian product, Relations, Equivalence relation, Functions, De Morgan's Law, Fundamental theorem of functions, Well order, Complete order, Zorn's Lemma, Natural numbers, Peano Axioms, Recursion Theorem, Integers, Division Algorithm (only statement), Greatest common divisor, Least common multiple, Euclidean Algorithm (only statement), Rational numbers, Real numbers, Complex numbers.

Groupoid, Monoid, Semigroup, Group, Klein group, Hamiltonian group, General linear group, properties of groups, Law of Exponents, Homomorphism between groups.

Ring, Subring, Integral domain, Division Ring, Field, Homomorphism between Rings.

Reference Books:-

1) An Introduction to Abstract Algebra: Zero
2) Algebra (Vol I): Ramji Lal
3) Undergraduate Algebra: Serge Lang.
4) A first course in Abstract Algebra: John B. Fraleigh.

B.Sc. (PCM\PMCS) Semester – II

Course Name: 3D Coordinate Geometry

Course Code: MAS-353 **Credit: 3-0-0**

Straight Line: Direction cosines, Direction ratios, Projectin of a point on a line, Projection of line to another line, Angle between two lines.

Plane: Normal Form of equation of Plane, Interceft form of equation of plane, General equation of plane (ax+by+cz+d=0) , equation of plane when two points or three points on plane is given, angle between two planes, position of points relative to plane, distance of a point from a plane, plane through intersection of two planes, the equation of pair of planes.

Straight line and the plane: Equation of plane in symmetrical and non-symmetrical form. Line through two points. To transform the non-symmetrical form into symmetrical form, Coplaner lines, Skew lines, Length and the equation of shortest distance.Relation between direction cosines of three mutually perpendicular lines.

Surface of Second Degree: General Equation of second dgree, Intersection of line and the surface, Tangent Plane, Polar Plane, The enveloping Cone & Cylinder (Definition), Section with given center, Diametral Plane, Principal Plane, Transform of General equation, Classification of Coinicoids.

Sphere: The equation of Sphere, Sphere through four points, Intersection of two spheres, Inersection of sphere and plane, Sphere through a given circle, Intersection of a straight line and sphere, Equation of the tangent plane, Plane of contact, Polar plane, Angle of intersection of two spheres, Power of a point.

Cone and Cylinder: The equation of cone, Equation of a cone with given conic base, Angle between the lines in which plane cuts a cone, three mutually perpendicular generators, Right circular cone.

Equation of cylinder through a given conic, Cylinder with axis parallel to coordinate axes, equation of right circular cylinder, Surface of Revolution.

Central Coinicoids: The Standard equation, the ellipsoid, The hyperboloid of one sheet, The hyperboloid of two sheets, Diameteral planes and conjugate diameter, Tangent planes, Normal, Cubic curve through the feet of the normals.

Reference Books: Analytical Geometry of Three Dimensions: Saran & Gupta

Semester – II
Course Title: Computer Organization

Course Code: **CSIT- 515** Credits: **4(3+1+0)**

UNIT-I

Introduction to Computers: Analog, Digital, Hybrid and Modern Digital Computers.

Digital Logic circuits and Components: Logic gates, Boolean algebra, K- maps, Half Adder, Full Adder, Coder, Decoder, Multiplexer, Demultiplexer, Flip-flop, Counters, Registers, Basic design of ALU.

UNIT-II

Data Representation: Data types, Complements, Fixed Point Representation, Floating Point Representation, Error Detection codes.

UNIT III

Register Transfer and Microperations: Register Transfer language, Bus and memory Transfer, Binary Adder, Binary Subtracter, Binary Adder – Subtracter, Binary Increment, Binary Decrement, Arithmetic Circuit, Addition and Subtraction Algorithms.

UNIT IV

Memory and Processor Organization: Memory Hierarchy, Main Memory (RAM & ROM) Associative memory, cache memory, Auxiliary memory, General Register Organization, Stack Organization, Addressing modes, Instruction Formats. RISC and CISC.

UNIT V

Introduction to Classification of Computers and Concepts of Pipeline : Flynn's Classification, Parallel Architecture Classification, Pipelining of processes.

Text Book:

Computer System Architecture – M. Mano, Pearson Ed.

Reference Books:

Digital circuits and Logic Design - M.Mano, Pearson Ed.
Digital Logic – T.C. Bartee , Mcgraw Hill
William Stalling, "Computer Organization & Architecture", Pearson education Asia

Semester – II
Course Title: Algorithms & Data Structure through 'C'

Course Code: CSIT-431 Credits**: 4(3+0+2)**

Unit –I

Algorithm: Introduction, Characteristics, Notation and format conventions of Algorithms, Algorithm Complexity and Time-Space trade-off.

Data Structure: Definition and classification of data structures, description of various data structures.

Arrays: Definition, Representation and analysis, Single and Multidimensional Arrays, Application of Arrays.

UNIT-II

Stack: Basic concepts and operations. Implementation: sequential and linked representation. Applications: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression.

Queue: Basic concepts and operations. Implementation: sequential and linked representation. Introduction to double ended Queues and Priority Queues. Applications of Queues.

UNIT-III

Linked List: Basic concepts and operations. Types of linked lists: Singly linked, Circular linked list, Doubly Linked list, and circular doubly linked list. Application of linked lists

UNIT-IV

Binary Trees: Definition, terminology and Applications of Binary Tree. Representation and Basic operations of binary tree. Traversal algorithms. Binary Search Trees: BST

UNIT-V

Sorting: Notation, concepts and algorithms: Selection, Bubble, Merge and Quick Sort.

Searching: Basic search techniques: Sequential and Binary searching

Graphs: Basic concepts, Representation and traversal algorithms: Breadth first search, Depth first search. Introduction of spanning trees, Applications of Graphs.

Text Books :

A.M.Tenenbaum & M.J. Augenstein, "Data Structures using C&C++", PHI
Horowitz and Sahani, "Fundamentals of data Structures", Galgotia Publication Pvt. Ltd.

References:

Jean – Paul Trembley G. Sorenson, "Introduction of Data Structure with Applications",. TMT
Rajni Jindan, "Data Structures", Umesh Publications N.Delhi.
G.S. Baluja, " Data Structures Through C", Dhanpat Rai & Co.

Practical List :

Write Program in C for following:

- Sorting programs: Bubble sort, Merge sort, Insertion sort, Selection sort, and Quick sort.
- Searching programs: Linear Search, Binary Search.
- Array implementation of Stack, Queue, Circular Queue, Linked List.
- Implementation of Stack, Queue, Circular Queue, Linked List using dynamic memory allocation.
- Implement infix to postfix conversion and evaluation of postfix expression
- Implementation of Binary Search Tree and traversal algorithms (inorder, preorder, postorder)
- Implementation of Graph and traversal algorithms (BFS, DFS).

Semester-II
Course Title: STRUCTURAL & SPOKEN ENGLISH
B. Sc. (PCM/ PCFS/ PMCS/ LSCFS/ ZBC)

Course Code: LNG-301 **Credit Hours: (2-0-2)**

Structure:

a. Word enrichment (Antonyms, Synonyms, Homophones, Homonyms, Acronyms)
b. Inflections – Noun
c. Tenses
d. Syntax- (SVO Pattern)
e. Modifiers (Adjective, Adverb, Participle)
f. Preposition (Usage)
g. Concord
h. Determiners (Central Specific)

Spoken English:

a. Accent and Stress
b. Rhythm
c. Self Introduction
d. Conversation in different Situations
e. Group Discussions

Speech Techniques:

a. Organizing
b. Delivering

Written Communication:

a. Organizing
b. Writing (Process)
c. Resume
d. Curriculum Vitae
e. Letter (Components, Request and orders)
f. Other Communications (Advertisements, Circulars, Invitation, Reports, Proposals)
g. Usage of Visual Aids in Technical writing.

Books Prescribed:

- Gerson, Sharon J. and Gerson, Steven M. Technical Writing-Process and product, I ed.2000, Pearson Education INC, New Delhi.
- Dickson, Grisalda J.S. Higgin's Technical writing 2004, Godwin Publication, Allahabad.
- Martinet A.V. and Thomason A.J.A Practical English Grammar, IV ed. 1986, Oxford University Press, Delhi
- Agarwal, Malti: Krishnan's Professional Communication, KRISHNA Prakashan Media (P) Ltd. Meerut.

Course Title: ATOMIC AND NUCLEAR PHYSICS

B.Sc. PCM/ PMCS/ PCFS

Semester-III

Course Code: PHY-431 **Credit Hrs: (3-1-0)**

Unit-1: Atomic Physics.

Origin of atomic spectra (historical background),Bohr's theory and explanation of different series in hydrogen spectra. Experimental verification of discrete energy levels, Correspondence principle, Bohr & Sommerfield model, Short comings of old quantum theory, De-Broglie hypothesis, plank's quantum hypothesis and explanation of photoelectric effect, Qualitative treatment of hydrogen atom, Quantum numbers, spin quantum number, Pauli's exclusion principle, Stern-Geriah experiment, elementary idea of X-rays.

Unit-2: Basic Nuclear Physics.

Basic constituents of nuclei, nuclear radii, Magnetic moment and quadrapole moments, Nuclear binding energy curve, stability of nuclei, Mass defect and

packing fraction, semi empirical mass formula, Nuclear forces.

Unit-3: Nuclear models and Radioactivity decay.

Feature of shell model, magic numbers and liquid drop model, Fusion and Fission, Idea of α-delay, Geigger-Nuttle rule, β-decay, β-spectrum and neutrino, γ-decay.

Unit-4: Elementary Particles.

Classification: Bosons and Fermions, photons, leptons mesons, Baryons and Hyperons-life times and their decay modes, Ideas of symmetries and conservation laws for various interactions, Quantum numbers, Iso-spin, Lepton number; Baryon number; Strangeness, hypercharge, Quarks.

Reference books:

1. Introduction to Atomic Spectra
   White; Tata McGraw Hill.
2. Nuclear Physics
   Kaplan; Narosa Pub.
3. Concepts of Nuclear Physics,
   Cohen; Tata McGraw-Hill.
4. Nuclear Physics
   D.C.Tayal
5. Nuclear Physics
   Roy &Nigam
6. Nuclear Physics
   S. N. Ghoshal

Course Title: OPTICS

B. Sc. PCM/ PMCS/ PCFS

Semester-III

Course Code: PHY-433 **Credit Hrs: (3-1-0)**

Unit-1: Interference.

Interference due to division of wave front, Bi-prism, Thickness of a transparent thin sheet, Interference due to division of amplitude, Interference due to thin films and wedge shaped films. Newton's Ring. Interferometers: Michelson's and Multiple beam. Intensity distribution and sharpness of fringes.

Unit-2: Diffraction.

Fresnel's Class: half period zone, construction of plane wave front, half period strips for cylindrical wave front, Rectilinear propagation of light, zone plate, diffraction at a single edge, Fresnel's integrals and Cornu's spiral.

Fraunhofer class: Diffraction at a single and double slit, Plane diffraction grating (Multiple), overlap and absent spectra, Dispersive power.

Unit-3: Polarization.

Polarization of light, pictorial representation, Brewster's law, Malus law, phenomenon of double refraction. Geometry of Calcite crystal, optic axis, principal section, ordinary and extraordinary rays; Construction and working of Nicol prism, circularly and elliptically polarized light, Dichroism, Polaroid, production and analysis of plane, circularly and elliptically polarized light, retardation plate. Optical, activity, rotatory dispersion, Fresnel's explanation of plane of polarization, Half shade and Bi-quartz polarimeter. Elementary idea of Kerr and Faraday effects.

Unit-4: Resolving power and Geometrical optics.

Resolving power, Ray-leigh criterions, Resolving power of prism, grating and telescope. Geometrical optics: Focal length of a system of two lenses separated by

a small distance, Cardinal points of coaxial system of lenses. Eye price (Ramsden's and Hugen's), Aberration in lenses and their removal.

Reference books:

1. Optics
   Ghatak
2. Principle of Optics
   Mathur.
3. Geometrical and Physical Optics
   Longhurst
4. A Text Book of Optics,
   Subramanyam and Brijlal

B.Sc. (PCM/PMCS) Semester – III

Course Name: Linear Algebra I

Course-Code: MAS: 421 **Credit: 3-0-0**

Basic concepts of rings, Sub rings, Integral Domains, Fields, System of Linear Equations, Matrices and Elementary Row Operations, Row Reduced Echelon Matrices, Matrix Multiplication, Invertible Matrices.

Vector Spaces, Subspaces, Quotient Spaces, Linear Independence, Bases, Dimension, Coordinates, Computations Concerning Subspaces.

Linear Transformation, The Algebra of Linear Transformations, Kernel, Range, Isomorphism, Matrix Representation of a Linear Transformation, Change of Base, Linear Functionals, Dual Space, The Transpose of a Linear Transformation.

Algebra, The Algebra of Polynomials, Lagrange Interpolation, Polynomial Ideals, The Prime Factorization of a Polynomial.

Reference Books:

1. Algebra (Vol. I & II) – Ramji Lal
2. Linear Algebra – Serge Lang
3. Finite dimensional vector space – P.R. Halmos
4. Linear Algebra- Hoffman & Kunze
5. Linear Algebra (a geometrical approach) - Kumaresan

B. Sc. (PCM \ PMCS) SEMESTER – III
Course Name: Real Analysis III

Course Code: MAS -422 **Credit :3-0-0**

Explicit and implicit functions, the neighbourhood of a point, maps from R^m to R^n, Limit and continuity, Algebra of limits and continuity, Sequences, Total derivatives, Partial derivatives, Directional derivatives, Algebra of differentiation, Chain rule, The mean value theorem, Repeated partial derivatives, Taylor's formula, Maxima and minima, The inverse function theorem and The implicit function theorem.

Integration & Step- Function, Upper & lower integrals of a bounded function. Riemann integral & its properties, Mean- Value Theorem for integrals, Improper integrals.

Reference Books:

1. Principles of Mathematical Analysis Walter –Rudin
2. Real Analysis- John M. Howie
3. Mathematical Analysis : T.M. Apostal
4. Mathematics Analysis: Somusundaram and B. Chodhury.
5. Elementary Analysis-2 (Functional of several variables): K. K. Azad and Kavita Srivastava.

B. Sc. (PCM \ PMCS) SEMESTER – III
Course Name: Statics

Course Code: MAS – 423 **Credit 3-0-0**

Common catenary, Intrinsic & Cartesian equations, Approximation to the common catenary centre of gravity, Centre of parallel forces, Centre of gravity of the curves, Centre of gravity of plane area, Centre of gravity of a solid of revolution, Centre of gravity of the sum or difference of two bodies, Centre gravity of three dimensional bodies, k Forces in three dimension, Central axis, Wrench, Pitch, screw, theorem on forces, reciprocal screw, null lines and null planes, Stable and unstable equilibrium, a body resting upon inside another body.

Reference Books:

1. Statics- R. S. Verma
2. Statics- P. Singh
3. Statics- S. L. Loney

Semester – III

Course Title: Object Oriented Systems and C^{++}

Course Code: CSIT – 532 **Credit: 4 (3 + 0 + 2)**

UNIT – I

Introduction: Introduction, Characteristics of Objects, Object Oriented Development, Object Oriented Themes – Abstraction, Encapsulation, Polymorphism and Inheritance.

UNIT – II

Basic C^{++} Concepts: **Classes and objects, Constructors and Destructors, Function overloading, Operator Overloading, Friend Function.**

UNIT – III

Object Modeling: Objects and Classes, Links and Associations, Generalization and Inheritance, Aggregations, Abstract Classes, Multiple Inheritance, Sample Object Model.

UNIT – IV

Dynamic Modeling: Events and States, Operations and Methods, State Diagrams, Concurrency, Relation of Object and Dynamic Models.

Functional Modeling: Functional Model, Data Flow Diagrams, Specifying Operations, Relation of Functional to Object and Dynamic Model.

UNIT – V

Advance C^{++} Concepts: Inheritance – Basic Concepts, types, Constructors and Destructors in derived classes. Pointers, Polymorphism – Compile Time and Run time. Introduction of Virtual functions and Abstract Classes.

Text Book :

1. Object Oriented Design and Modeling – James Rambaugh etal, PHI.
2. Object Oriented Programming with C++ - E. Balagurusamy, TMH.

References:

1. Object Oriented Conceptual Modeling – Dillon and Lee, PHI.
2. Introduction to Object Oriented Analysis and Design – Stephen R. Shah, TMH.
3. The Waite's Group OOP using C++ - Robert S. Lafore, Galgotia Publications.

Semester – III

Course Title: Fundamentals of Operating Systems

Code: CSIT- 522 **Credits: 4(3+0+2)**

UNIT -I

Introduction: **Evolution of Operating System, Types of Operating System: Batch Processing, Multiprocessing, Time-sharing, Client Server, Distributed.**

Linux OS: **Introduction, Vi editor, commands, shell programming.**

UNIT- II

Process Management: **Process concepts, Process scheduling, Inter-process Communication. Process Synchronization: Critical Section Problem, Semaphores, classic problem of synchronization.**

UNIT- III

CPU Scheduling: Scheduling concepts and criteria, Scheduling algorithms, Algorithm evaluations, Multiple processor scheduling.

Deadlock: Deadlock problem, Deadlock Characterization, Methods for handling deadlocks, Deadlock Prevention and Avoidance, Deadlock Detection and recovery.

UNIT -IV

Memory Management: **Introduction, Swapping, Paging, Segmentation, Segmentation with paging. Virtual memory: Concept, Page replacement, Allocation of frames.**

File System: **File Concept, File-system structure, Access methods, Directory structure, File sharing and protection,**

UNIT- V

Unix / Linux: **History, shell programming, system administration, Vi Editor and other command level details of UNIX, Design principles: File system, I/O System, Inter process communication.**

UNIT- V

Case study of Linux Operating System: History, Design principles, process management, Scheduling, Memory management, File System, System calls.

Text Book :

1. Shilberschatz, “Operating System Concept”, John Wiley & Sons (Asia) Pvt Ltd .

References:

1. Milan Millenkovic, “Opreating System”, TMH
2. A.S. Tanenbaum, ” Operating System”, Pearson

Course Title: MODERN OPTICS

B. Sc. PCM/ PMCS/ PCFS

Semester-IV

Course Code: PHY-434 **Credit Hrs: (3-1-0)**

Unit-1: X-Rays

Origin, production and properties, Laue spots and Bragg's law for X-ray diffraction, Bragg's X-ray spectrometer. Debye and Scherrer method. Continuous X-ray and Bremsstrahlung process. Characteristic X-ray spectra, Mosley's law.

Unit-2: Lasers

Concept of spontaneous and induced emission, Einstein coefficients. Basic principles of laser action; Population inversion and different pumping methods. Rate equation for a three level laser. Simple idea of laser cavities and their characterization . Characteristic of laser radiation. Ruby and He-Ne laser.

Unit-3: Holography

Basic principle of holography, Recording and reconstruction of hologram. Property of a hologram, Holographic process viewed as Bragg diffraction. Holographic storage.

Unit-4: Non-linear Optics

Physical origin of non-linear polarization of the medium. Non-linear interaction of light with materials. Wave propagation in non-linear medium. Second harmonic generation. Phase matching ,frequency mixing, Self focusing phenomena.

Reference books:

1. Introduction to Atomic spectra
   White
2. Elementary Modern Physics
   Arya
3. Modern Physics
   Murugeshan
4. Optical Electronics
   Ghatak & Tlyagarjan.
5. Laser – Theory & Applications
   Thyagranjan / Ghatak
6. Laser & Non-Linear Optics
   B. B. Laud

Course Title: Statistical Physics and Astrophysics
B. Sc. PCM/ PMCS/ PCFS
Semester-IV

Course Code: PHY-436 **Credit Hrs: (3-1-0)**

Unit-1:

Probability and distribution functions, Binomial and Gaussian distributions. Macroscopic and microscopic states. Phase space, Contact between static and thermodynamics. Calculation of thermodynamic quantities. Ensemble average. Liouville's Theoren in classical mechanics.

Unit-2:

Microcanonial ensemble, classical ideal gas. Entropy of mixing and Gibb's paradox. Harmonic oscillator, partition function physical significance of various statistical quantities. Canonical ensembles. Description of classical ldeal gas and harmonic oscillator. Grand-canonical ensembles. Calculation of statistical quantities and their physical significance. Maxwell Boltman, Fermi-Dirac and Bose-Einstein statistics.Photon statistics and plank radiation formula. Bose condensation.

Unit 3:

Section of a sphere, concepts of small and great circles, spherical triangles and their properties.Celestial Sphere: Systems of Co-ordinates. Annual motion of the sun, and ecliptic, Rising and setting of stars, Latitudes and Longitudes.

Unit 4:

Kepler's Laws, Newton's Laws of gravitation, Ecliptic motion, Anomally, Kepler's equation, Euler's theorem. Planets, Stars and Galaxy; Origin of the Solar System- Hypotheses, the planet Earth, atmosphere and its usefulness.,Solar phenomenon and solar Energy.

References:

1. Spherical Astronomy: Gorakh Prasad and N. Saran (Pothisala Pvt. Ltd; India)
2. Spherical Astronomy: Lodhunter, S.C., Gorakh Prasad and N. Saran (Revised) (Pothisala Pvt. Ltd., India).
3. General Science: Introduction to Astronomy, Astrophysics, Physics, Climatology Etc.: J.P. Sharma (Gita) Press Road, Gorakhpur, India)
4. Spherical Trigonometry and Spherical Astronomy: Pragati Prakashan, Meerut, India): Malik and Pandey.

B.Sc. (PCM/PMCS/ PCFS) Semester-IV

PHYSICS LAB. – II

Course Code: PHY–430 **Credit Hrs: 0-0-4**

List of Experiments

1. To determine the wavelength of Sodium light with help of Michelson Interferometer.
2. To determine the wavelength of Sodium light by Newton ring method.
3. To determine the wavelength of Sodium light using Fesnel's Bi-prism.
4. To determine the refractive index of the prism and its dispersive power with the help of spectrometer.
5. To determine the wavelength of different spectral light emitted by light sources with the Plane Transmission Gratings.
6. To verify Newton's formula for combination of two lenses.
7. To find the focal length of concave and convex lenses.
8. To calibrate a given Voltmeter of *L*-ampere range with the help of potentiometer.
9. To calibrate a given Voltmeter of *L*-volts range with the help of potentiometer.
10. To convert a Weston galvanometer with an Ammeter and voltmeter.
11. To find out internal resistance of Lechlanche cell by means of Potentiometer.
12. To compare two resistances by means of Potentiometer.
13. To find out and unknown resistances with help of Meter Bridge.
14. To determine the ballistic constant K of a moving coil Ballistic Galvanometer and to calibrate Ballistic Galvanometer.
15. To plot a graph showing variation of magnetic field with distance along the axis of circular coil carrying current and to estimate from it the radius of the coil with the help of Helmholtz Galvanometer.
16. To determine the magnetic movement (M) of a magnet and horizontal component of Earth's Magnetic field (H) using deflection magnetometer.
17. To determine the magnetic movement (M) of a magnet and horizontal component of Earth's Magnetic field (H) using vibration magnetometer.
18. To determine the electro chemical equivalent of Copper using copper voltmeter.

B.Sc. (PCM/PMCS) Semester – IV

Course Name: Linear Algebra – II

Course Code: MAS: 451 **Credit: 3-0-0**

Determinant Functions, Permutations and Uniqueness of Determinants, Modules, Multilinear Functions, The Grassman Ring.

Characteristic Values, Annihilating Polynomials, Invariant Subspaces, Simultaneous Triangulation, Simultaneous Diagonalization, Direct Sum Decompositions, Invariant Direct Sums, The Primary Decomposition Theorem.

Inner Products, Inner Product spaces, Linear Functionals and Adjoints, Unitary Operators, Normal Operators, Forms on Inner Product spaces, Positive Forms, Spectral Theory.

Reference Books:

1. Algebra (Vol. I & II) – Ramji Lal
2. Linear Algebra – Serge Lang
3. Finite dimensional vector space – P.R. Halmos
4. Linear Algebra- Hoffman & Kunze
5. Linear Algebra (a geometrical approach) - Kumaresan

B. Sc. (PCM/PMCS) Semester – IV
Course Name: Numerical- Analysis

Course-Code: MAS 452 **Credit: 3-0-0**

Numerical solution of algebraic equations- Bisection Method, Regula – Falsi Method, Iteration Method, Newton- Raphson Method, Muller's Method, Solution to the System of Nonlinear Equations

Interpolation- Finite differences, Newton's formulae for interpolation, Gauss's central difference formula, Stirling-formula

Numerical differentiation & integration, Trapezoidal-rule, Simpson's 1/3 & 3/8 rules.

Numerical solution of ordinary differential equations– Picard's method, Euler's-method.

Reference Books:

1. Introductory methods of Numerical Methods: S.S. Sastry
2. Engineering Mathematics: E. Kreyszig.

B. Sc. (PCM/ PMCS) Semester – IV
Course Name: Dynamics

Course- Code: MAS – 453 **Credit: 3-0-0**

Kinematics and Kinetics: Motion in two dimension, Radial and transversal velocities and accelerations, Tangential and normal velocities and accelerations, Angular velocity, Relative motion.

Rectilinear Motion: Motion in a straight line, Simple Harmonic Motion (SHM), Geometrical representation, Motion under inverse square law, motion under other laws of force, Terminal velocity, Motion under gravity in a resisting medium.

Constrained Motion: Uniform circular motion, Satellite describing a circular orbit, Smooth hollow sphere rotating with uniform angular velocity, Cycloidal Motion, Cycloidal pendulum.

Central orbit: Motion of a particle under central forces, parabolic orbit, Elliptic orbit, Hyperbolic orbit, Apse, Apsidal distance, Apsidal angle, Kepler's laws of planetary motion, relative motion or the planet about the sun.
Three dimensional motion, Velocity & acceleration (in polar & cylindrical co-ordinates).
Reference Books:
Elementary Dynamics- P. L. Srivastava
Dynamics- Ramsay
Dynamics- P. Singh
Dynamics- S. L. Loney

Semester – IV

Course Title : Java Programming

Course Code: CSIT – 652 **Credit: 3(2+0+2)**

UNIT – I :

Basics of Java

The genesis of java, importance of java. Security and Portability. Concept of java Bytecode and Java Virtual Machine. Characteristics of java.

UNIT – II :

Object-oriented Concepts

Objects and classes. Object oriented programming characteristics: Abstraction, Encapsulation, Inheritance and Polymorphism. Implementation of OOP in java: classes, access modifiers, extending classes, overloading and overriding.

UNIT – III :

Programming with Java

Data types, constants, variables, arrays, operators and control statements used in java.

Classes and Objects

Concept of class. The general form of class. Declaring objects. Introducing methods in a class. Constructors. Inner and outer class. Exploring the String class.

UNIT – IV :

Access control and modifiers

Public access control. Private access control. Protected access control. Implementation of static, this and super keywords. Understanding final keyword in java.

Inheritance

Basic concepts. Using super. Method overloading. Method overriding. Dynamic method dispatch. Using abstract classes. Using final with inheritance.

UNIT – V :

Advanced Concepts

Packages. Importing packages. Interfaces. Exception types. Exception handling: using try/catch statements, using throws statement. Multi-threaded programming.

Text Book:

"Programming with Java" by E Balaguruswamy.

Reference Books:

"Java-2, The Complete Reference" by Patrick Naughton and Herbertz Schidt.
"HTML 4 unleashed" by Rick Dranell, second edition, Techmedia publication.
"Dynamic web publishing" unleashed by Shelley Powers, second edition, Techmedia.
Horstmann, "Computing Concepts with Java 2 Essentials", John Wiley.
Decker & Hirshfield, "Programming.Java", Vikas Publication.

Semester – IV

Course Title: Relational Database Management System

Course Code: CSIT 531 **Credit: 4(3+0+2)**

UNIT - 1

Overview

Basic Database Concepts and characteristics, Relational Data base Concepts and its characteristics
Introduction to Oracle, Introduction to SQL (Structured Query Language) * Plus , SQL Data types

UNIT - 2

Data Manipulation and Control

Data Definition language, Creating tables, Creating a table with Rows from another table, Inserting Values into table, Updating columns of a table, Deleting rows from a table, Querying Database tables, Conditional Retrieval of rows, Working with Null values, Matching a pattern with column from a table, Introduction to Sequences, Database security and privileges, GRANT Command, REVOKE Command, COMMIT and ROLLBACK commands

Querying Multiple Tables

Equi joins, Cartesian joins, Outer join, Self join, Set operator, Union, Intersect, Minus, Nested Queries

UNIT -3

View

Introduction to views, Manipulation of Base table through views, Rules for DML statements on join views, Dropping a view

Functions

Column Functions, Arithmetic Functions, Character function, Data function, General Functions, Group functions.

SQL * Plus Reporting

Introduction to SQL * Plus reporting, SQL * Plus Environment Commands, Manipulating variables, Defining Header, Footer & Column Heading, Formatting columns, Control break reports

UNIT -4

Embedding SQL Statements into Procedural Language (PL)

Introduction to PL/SQL, The advantages of PL/SQL, PL/SQL Block Structure, PL/SQL Architecture, PL/SQL Data types, Variables and Constants, Scope and Visibility of a variable, Assignments & Expressions, Referencing Non PL/SQL variables, Introduction to Built – in – functions, Conditional and Interactive Control, SQL within PL/SQL

Cursor and Exception handling

Introduction to cursor and its management in PL/SQL, Cursor manipulation, Implicit cursor & its attributes, Exception handling in PL/SQL, Predefined exceptions, User defined exceptions

Advanced features of procedural language for database applications

Subprogram in PL/SQL, Advantages of subprograms, Introduction to procedures, Introduction to functions. Stored packages, Advantages of packages, Dropping procedures, functions and packages

Triggers

Introduction to triggers, Types of triggers, Dropping triggers

UNIT 5

Introduction to Object relational database management system (ORDBMS)

What is an object, What is an object technology, Creation of objects, How to maintain database using objects

Text Books:

1. Ivan Byross, “SQL PL/SQL “, BPB

References:

1. Scott Urman, “ SQL PL/SQL Programming”, TMH
2. S.B. Navathe, “Database Management System”, Wesley Addition

Course Title: QUANTUM MECHANICS
B.Sc. PCM/ PMCS/ PCFS
Semester-V

Course Code: PHY-531 **Credit Hrs: (3-1-0)**

Unit I : Inadequacy of Classical Mechanics

Black Body Radiation, Rayleigh-Jean's Law, Wien's law, Planck's Radiation Law, Photoelectric Effect and its experimental results, Einstein's Theory of Photoelectric Effect, Compton Effect and experiment.

Unit II : Difficulties with classical Theory of specific Heats of Solids-

Einstein's Theory of Specific Heats, Debye's modification. Bohr's Theory of Hydrogen Atom, Experimental verification, Bohr's correspondence principle, Franck & Hertz Experiment, J.P. Thomson's Experiment, Wilson- Sommerfeld Quantization Rule & Applications.

Unit III : Foundations of Wave Mechanics

Dual Nature of Light, Experimental evidence for Matter Waves, de-Broglie concepts of Stationary orbits & de-Broglie wavelength. Phase velocity, group velocity & relationship in case of a free particle, Equation of motion for a material particle, physical Interpretation of ψ. Uncertainly principle, Examples and application.

Unit IV : Application of Schrodinger Equation -D

Free Particle, Particle in a Box, Potential Step, Rectangular Potential Barrier, Application to $\propto$-decay, 1-D infinitely Deep Well, 3-D Square Well potential, 1-D Linear Simple Harmonic Oscillator.

Reference books:

1. Basic Quantum Mechanics
   Ajoy Ghatak
2. Quantum Mechanics
   Peebles
3. Quantum Mechanics
   Agarwal / Hari Prakash
4. Introduction to Quantum Mechanics
   Pauling / Wilson
5. Quantum Mechanics,
   Schiff
6. Quantum Mechanics
   Powell and Crasemann
7. Quantum Mechanics
   Eisberg / Resnick
8. Advanced Quantum Mechanics
   J. J. Sakurai

Course Title*:* ELECTRONICS – I

B. Sc. PCM/ PMCS/ PCFS

Semester-V

Course Code: PHY-533 **Credit Hrs: (3-0-0)**

Unit-I: Introduction to Semiconductors

Bohr's Theory, Atomic Structure, Energy bands, Valence band, Conduction Band & for bidden energy gap. Insulators, semi-conductors and conductors. Types of Semiconductors, P-type, N-type semiconductor, Mechanism of conduction in electrons and holes.

Unit-II: Power Supplies

PN diode, its principle & working. PN diode as rectifier; half wave and full wave. DC and RMS current, power efficiency. Ripple factor, peak inverse voltage, Regulation bridge rectifier. Capacitor and inductor as filters. L& π section filters, Zener diode and voltage regulation.

Unit-III: Basic Logic Concepts

Digital and analog methods; Number systems: Decimal, Binary, Hexadecimal and Octal, Conversion between number systems. One's, Two's complement and Nine's complement, Binary Arithmetic. Binary codes: BCD, Gray. Excess-3.

Reference books:

1. Electronic Devices & Circuit Theory
   Bodystead / Nashelsky
2. Electronic Principles
   Malvino
3. Electronic Devices & Circuits
   Sanjeev Gupta
4. Principles of Electronics
   V.K.Mehta
5. Electronic Devices & Circuits
   David A. Bell
6. Electronic Fundamental & Applications
   John K. Ryder

B. Sc. (PCM/PMCS) Semester – V
Course Name: Algebra – II

Course Code: MAS 521 **Credit 3-0-0**

Groups, Euler's ϕ function, Group of residue classes modulo m, Matrix groups, Dihedral groups, properties of Groups, Wilson Theorem, Homomorphism, Epimorphism, Monomorphism, Isomorphism, Endomorphism, Automorphism, Torsion Free groups, Coset decomposition, Lagrange Theorem, Poincare Theorem, Euler-Fermat theorem, External direct product, Internal direct product, Normal subgroups, Quotient groups, Fundamental Theorem of homomorphism, First and No ether Second Isomorphism Theorem, Symmetric groups, Alternating groups, Cayley's Theorem.

Rings, Properties of Rings, Binomial Theorem, Integral Domain, Division Ring, Fields, Characteristic of an Integral domain, Ring homomorphism, Field of fractions.

Reference Books:-

1) Algebra (Vol I): Ramji Lal
2) Basic Algebra: Nathan Jacobson
3) Group Theory: I.B.S. Passi
4) Ring theory: I.B.S. Passi
5) A first course in Abstract Algebra: John B. Farleigh

B. Sc. (PCM\ PMCS) Semester – V
Course Name: Advanced Analysis

Course Code: MAS – 522 **Credit: 3-0-0**

Metric spaces, Pseudo metric, closed sets, open sets, Separable space, Limit points, Boundary points, Interior of a set , Closure of a set, Continuous maps, Sequence in a Metric space, Homomorphism, Complete metric spaces, Compact metric spaces, Bolzano- Weirstrass property, Borel – Lebesgue Theorem, Total Boundedness, Baire Category theorem, Banach contraction principle, Connected metric space Dense sets $F\sigma$ and $G\delta$ functions Cantor sets, perfect sets, Lebesgue measure, Lebesgue integral, Differentiation and integration, Uniform continuity connectedness.

Reference Books:

1. Real Analysis- John M. Howie
2. Real Analysis & Complex Analysis: Walter Rudin
3. Principles of Mathematical Analysis Walter –Rudin
4. Mathematical Analysis: T.M. Apostal
5. Elementary Analysis (Metric space): K. K. Azad and Kavita Srivastava.
6. Mathematics Analysis: Somusundaram and B. Chodhury.

B. Sc. (PCM/ PMCS) Semester – V
Course Name: Hydrodymamics

Course Code: MAS- 523 **Credit: 3-0-0**

Kinematics, characteristic of a fluid, Lagrange's method, Euler's method equation of continyity, equation of fcontinuity in Cartesian co-ordinates, equation of continuity in polar co-ordinates, stream lines, path lines Equation of Motion, Euler's dynamical equations, Euler's momentum theorem, D' Alembert's paradox Application of dthe Principle of Energy, sources and sinks, Doublets, images in two dimension Motion of Cylinders, general motion of a cylinder in two dimensions, motion of a circular cylinder, stream lines, liquid streaming past a fixed circuloar cylinder, Two co-axial cylinder (Initial motion), Motion in three dimensions, strength of doublet, motion of a sphere in infinite mass of liquid at rest, Viscosity, coefficient of viscosity, general motion of fluid element, Analysis of stress, Principal Streesses, Stokes' relation, Navier-Stokes' equations.

Reference Books:

1. Hydrodynamics- Ramsay
2. Hydrodynamics- M. Ray & G. C. Chadda
3. Hydrodynamics- Milne & Thomson

Semester-V
Course Title: ENVIRONMENTAL STUDIES – I
B. Sc. (PCM/ PCFS/ PMCS/ LSCFS/ ZBC)

Course Code: ENV-415 **2 Credit (2-0-0)**

1: The Multidisciplinary Nature of Environmental Studies
Definition, Scope and Importance

(i) Ecosystems

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposes
- Energy flow in the ecosystem
- Ecological succession
- Food chains, types, Chacretistics features, structures and function of the following ecosystem:

(a) Forest Ecosystem
(b) Grassland Ecosystem
(c) Desert Ecosystem
(d) Aquatic ecosystem (Ponds, streams, lakes, river, oceans, estuaries.)

(**ii) Social Issues and the Environment**

- From Unsustainable of sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, water shed management
- Resculement and rehabilitation of people; Its problems and concerns Case studies
- Environmental ethics, Issues and possible solutions
- Climate change, global warming, and rain ozone layer depletion, nuclear accidents and holocaust, Case studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of pollution) Act.
- Visit to local polluted site-Urban/ Rural/ Industrial/ Agricultural
- Study of Common plants, insects, birds
- Study of simple ecosystems-Ponds, river, Hills/ Pocs etc (Field work equal to 5 lecture hours).
- Issues involved in enforcement of environmental legislation, Public awareness.

Semester –V
Course Title: Data Communication and Networking

Course Code: CSIT 623 **Credit: 4 (2+1+2)**

Unit 1 Introduction: Definition of computer network, Communication model, Communication tasks, OSI reference model, TCP/IP protocol suite, Encapsulation procedure, Networking devices, Introduction to protocols of each layer of OSI reference model.

Unit 2 Data communication: Analog and Digital Transmission, Transmission basics, Encoding techniques (Analog data to analog Signal, Digital data to analog signal, Analog data to digital signal, digital data to analog signal), Serial Transmission, Parallel transmission, Synchronous and Asynchronous transmission, Multiplexing, FDM, TDM **Transmission Media:** Introduction, Guided Media: Twisted pair, Optical fiber, Unguided media: Microwave, Radiowave, Infrared

Unit 3 Data Link Layer: Introduction, Flow Control, Error detection, Error control, HDLC **Local Area Network:** Introduction, LAN architecture, Media Access Control, Logical Link Control, LAN topologies, IEEE 802.3 LAN: MAC technique(CSMA/CD), Physical Layer Specification, IEEE 802.11 LAN

Unit 4 Network Layer: Introduction, Routing algorithms (Distance Vector Routing, Link state routing), IP Addressing, Some essential Protocols: IP, ARP, RARP, DHCP, ICMP, Internetworking: RIP, OSPF, BGP

Unit 5 Transport Layer: Introduction, Port Address, TCP: mechanism, TCP header, UDP, UDP header

Unit 6 Application Layer: Introduction, FTP, TFTP, HTTP, SMTP, POP3, DNS, TELNET

Text Book:

1. ,Behrouz A Forouzan, “Data Communications and Networking”, TMH

Reference Books:

1. William Stallings, “Data and Computer Communication”, Prentice Hall
2. A.S. Tanenbaum, “Computer Networks” , Prentice Hall

Semester – V

Course Title: System Analysis and Design

Course Code: CSIT 432 **Credit: 3 (2+1+0)**

UNIT-I

Introduction: Definition of System, Characteristics of a System, Elements of a System, Types of System.
System Development: System Development Life Cycle, Phases of SDLC, Role of System Analyst

UNIT-II

Feasibility Study: Basic concepts, Steps in the feasibility study, Types of feasibility study, Feasibility report, Cost Benefit analysis, Procedure for Cost benefit determination.

System Analysis: Basic concepts, System planning and initial investigation, Information gathering, Information gathering tools, Tools for Structured Analysis: Data Dictionary, Data Flow Diagram, Decision Tree, Decision table.

UNIT-III
System Design: Basic concepts, Logical and Physical Design, Structured Design, Coupling, Cohesion, Structured Chart, Architectural Design, Data Design, User Interface Design.

UNIT-IV

System Testing: Testing Principles, Testing Objectives, Test Plan, Types of Testing: Black Box and White Box Testing, Unit Testing, Integration Testing, System Testing, Software Quality and Quality Standards.

UNIT-V
Quality Assurance: Software Quality Assurance, Software Quality Standards.

Implementation and Maintenance: Introduction, Conversion, Maintenance, Activities of maintenance procedure

Text Book:

1 Elias M. Awad, "System Analysis and Design", Galogotia Publications (P) Limited, 2nd Edition

Reference Books:

2. Jeffery L. Whitten, Lonnie D. Bentley and Kevin C. Dittman, "System Analysis and Design Methods" 5th Edition, 2000, McGraw-Hill.

Assignment: Students to present a case study (in groups of 4 to 5) on an existing system.

Course Title: SOLID STATE PHYSICS

B. Sc. PCM/ PMCS/ PCFS

Semester-VI

Course Code: PHY-532 **Credit Hrs: (3-1-0)**

Unit 1: Crystalline solids, crystal structure, Elements of external Symmetry of crystals, symmetries of a cube, primitive lattice, cell and unit cell, symmetry operations, No. of atoms per unit cell and coordination no. for cubic lattice cells, Packing factor, Miller indices.

Unit 2: Separation between lattice planes for cubic lattice, Reciprocal Lattice, Diffraction of X-rays, Bragg's law, comparison of X-ray, electron and neutron diffraction by crystals, Ionic bonding, potential energy diagram of ion molecules, covalent bonding, Vanderwall's bonding, Metallic bonding & hydrogen bonding.

Unit 3: Lattice vibrations, phase velocity, Group velocity, Lattice defects, classification of defects. (pt. defeat, line defeat, plane defeat) Lattice vacancies, Specific heat of gases, specific heat of Solids, Einstein's model of the lattice specific heat of Solids.

Unit 4: Properties of metals, Lorentz- Drude theory, Electrical conductivity & Ohm's law. Thermal conductivity, Kroning - Penney model, Bloch theories. Relaxation time, Mean free path, Mobility and Drift velocity, Superconductivity.

Reference books:

1. Introduction to Solid State Physics
   Kittle
2. Solid State Physics
   Dekker
3. Introduction to Solids
   Azaroff
4. Solid State Physics
   R.L. Singhal
5. Solid State Physics
   Ashcoft & Mumin
6. Crystallography for Solid State Physics
   Verma & Srivastava

Course Title: ELECTRONICS – II

B. Sc. PCM/ PMCS/ PCFS

Semester-VI

Course Code: PHY-534 **Credit Hrs: (3-0-0)**

Unit-I: Bipolar junction transistor

Junction transistors and their working, Basic transistor equation. Transistor configurations, α and β of transistors. Biasing techniques and stabilization. JFET & MOSFET. *Z*, *y* and *h* parameters and their interrelations. Single stage CB, CE & CC amplifiers and their comparison.

Unit-II: Oscillators

Feedback in amplifiers: principle and effect on amplifier characteristics. Classification of Oscillators, Principle of feedback oscillators, Barkhausen criterion. Analysis of turned collector, tuned base, Hartley, Colpitt, R.C. phase shift and Wein's Bridge Oscillators.

Unit-III: Digital Electronics

Logic gate: AND, OR, NAND, NOT and NOR gates. Their electrical and electronics circuits, Truth tables, EXOR gate, Half adder full adder and subtractor. Series and Parallel Adders.

Reference books:

1. Electronic Devices & Circuit Theory
   Bodystead / Nashelsky
2. Electronic Principles
   Malvino
3. Electronic Devices & Circuits
   Sanjeev Gupta
4. Principles of Electronics
   V.K.Mehta
5. Electronic Devices & Circuits
   David A. Bell
6. Electronic Fundamental & Applications
   John K. Ryder

Semester-VI
Course Title: Physics Lab-III
B. Sc. PCM/ PMCS/ PCFS

(ELECTRONICS)

Course Code PHY-530 **Credit Hrs: (0-0-4)**

1. To draw the characteristic of Si semiconductor diode and calculate its forward resistance.
2. To draw the characteristic of Ge semiconductor diode and calculate its forward resistance.
3. To draw the characteristic of Zener diode in reverse and forward bias voltage.
4. To draw the input and output characteristic for a PNP transistor in the Common emitter configuration and evaluate the hybrid parameters.
5. To draw the input and output, characteristic for a PNP transistor in the Common base configuration and evaluate the hybrid parameters.
6. To draw the input and output characteristic for a PNP transistor in the Common collector configuration and evaluate the hybrid parameters.
7. To study Lissajous figures by C.R.O to determine the wave from and frequency of an electrically maintained turning fork using C.R.O.
8. Using A.C. supply find gain for common emitter configuration.
9. Verify open characteristic and find slow rate value for it.
10. To verify Truth table of OR and AND gate.
11. To verify Truth table of NOR and NAND gate.
12. To verify Truth table of XOR gate.

B. Sc. (PCM/PMCS) Semester – VI
Course Name: Partial-Differential Equations

Course Code: MAS -551 **Credit 3-0-0**

Partial – Differential equations: Origin, order, Lagrange Linear equation, integral surfaces through given curves, orthogonal surfaces, non-linear partial- differential equations, their solutions, Char pit method, Jacobi-method, Monges-Method, partial-differential equations of second order, origin, equations with variable coefficient, canonical forms, method of separation of variables, applications of partial differential equations, laplace-equation.

Reference Book: Partial Differential Equations: Snnedeon

B.Sc. (PCM/PMCS) Semester – VI
Course Name: Number Theory

Course-Code: MAS 552 **Credit: 3-0-0**

Basic Properties of Divisibility, Fundamental Theorem of Arithmetic, Mersenne Primes and Fermat Numbers, Euclid Algorithm, Division Algorithm.
Diophantine Equations, Linear Diophantine Equations, Pell's Equations
Arithmetic Functions, Functions $\tau(n), \sigma(n), s(n)$; Perfect, Amicable and Sociable Numbers; Functions $\phi(n), \lambda(n), \mu(n)$, Distribution of Prime Numbers

Basic properties of Congruences, Modular Arithmetic, Linear Congruences, The Chinese Remainder Theorem, High Order Congruences, Legendre and Jacobi Symbols, Order and primitive roots, Indices and k_{th} Power Residues.

Reference Books:

1.Algebra (Vol. I) – Ramji Lal
2.Number Theory for Computing- Song Y. Yan

B. Sc. (PCM/PMCS) Semester – VI
Course Name: Optimization Techniques

Course-Code: MAS 553 **Credit: 3-0-0**

Convex sets, convex polyhedron.
General Linear Programming Problem, Formulation of LPP, Feasible solutions, Basic Solutions, Optimal solution, Graphical method ,
Algebraic Methods: Simplex method, Degeneracy, Duality in LP problems, Big. M-method
Transportation problems: Least cost method, Vogel's Approximation method, MODI (Modified Distribution) Method
Assignment problems: Hungarian Method, Sequencing, Routing Problem

Game Theory: Matrix (or rectangular) games, Minimax and Maxmin theorem, Saddle point, Game without saddle point, Fundamental theorem of Game theory, Dominance principle.

Reference Books :

1. Operation Research: An introduction: H.A. Taha.
2. Optimization methods in operations research and system analysis: K.V. Mital, C. Mohan.
3. A fundamental Approach to Operations Research: Swapnil Srivastava

Semester-VI
Course Title: ENVIRONMENTAL STUDIES-II
B. Sc. (PCM/ PCFS/ PMCS/ LSCFS/ ZBC)

Course Code: ENV-416 **Credit: 2 (2-0-0)**

1) **Natural Resources**
   (a) Forest resources
   (b) Water resources
   (c) Mineral resources
   (d) Food resources
   (e) Energy resources
   (f) Land resources

   Role of an individual in conservation of natural resources.
   Equitable use of resources for sustainable life style.

2) **Biodiversity and its conservation**
   (a) introduction- Definition genetic, species and ecosystem diversity
   (b) Bio geographical classification of India.
   (c) Value of diversity consumptive use, productive use, social, ethical aesthet and option values.
   (d) Biodiversity at global, National and local levels.
   (e) India as mega-diversity nation
   (f) Hot – Spots of biodiversity
   (g) Threats to biodiversity habitat loss, poaching of wild life, man-wild life conflicts.
   (h) Endangered and endemic species of India
   (i) Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity**.**

3) **Environment Pollution**
   Definition
   Causes effect and control measures of
   (a) Air Pollution
   (b) Water Pollution
   (c) Soil Pollution
   (d) Marine Pollution
   (e) Noise Pollution
   (f) Thermal Pollution
   (g) Nuclear hazards
   Solid waste Management; Causes, effect and control measures of urban and industrial wastes.

   Role of an individual in prevention of pollution
   Pollution case studies
   Disaster Management: floods, earthquake, cyclone and landslides.

Semester – VI
Course Title: **LINUX & SHELL PROGRAMMING**

CSIT- 601 **Credit: 4(2+1+2)**

Unit-I Introduction
Introduction to Linux, Linux system organization (the kernel and the shell), Files and directories, Library Functions and system calls, vi Editor , Introduction to open source

Unit-II Linux Shell Programming
Types of shells, Shell Metacharacters, Shell variables, Shell scripts, Shell commands, the environment, Integer arithmetic and string manipulation, Decision making and loop control, controlling terminal input, trapping signals, arrays.

Unit-III Portability with C
Introduction : 'C' programming in Linux Environment , Basics of Linux system calls and Libraries.
Process Management System calls: fork, exit, wait, exec, kill etc.

UNIT-IV Signals and IPC

Signals: Concepts, unreliable signals, Interrupted system calls, Reentrant Functions, Different signal handling functions.

Inter Process Communication: Pipes, Coprocessors, FIFOs, Semaphores, Shared Memory.

Unit-V Linux System Administration
File System, mounting and unmounting file system, System booting, handling user accounts, backup, recovery, security, creating files, storage of files, Disk related commands.

Text Books

1. Sumitabha Das, "Unix Concepts and applications", TMH.
2. W. Richard Stevens and Stephen A. Rago, Advanced Programming in the UNIX Environment, Second Edition, Addison Wesley, 2005

References:

1. Yashwant Kanitkar, "Unix Shell Programming", BPB.
2. Meeta Gandhi, Tilak Shetty, Rajiv Shah, "The 'C' Odyssey Unix- the open boundless C", BPB.
3. Prata, "Advance Unix Programming guide", BPB.

Course Title: Internet and Web Technologies
Semester-VI

Course Code: CSIT-504 **Credit: 4 (3-0-2)**

Unit-1
Introduction to Internet
Introduction to Internet and Word Wide Web, History of Internet, Applications, Conection types, Internet domain, Working of Internet, Internet Service Providers, Uniform Resource Locator, E-mail, Search Engine, Web Browsers, Web Servers, HTTP, FTP and other Protocols.

Unit-2
HTML
Introduction to HTML, HTML tags, Structure of HTML Program, Text Formatting, Heading Style, Text Style, Controlling font Size and Color, Creating Lists, Creating Tables, Linking Documents, Frame, Creating Forms.

Unit-3
Dynamic HTML
Understanding Cascading style sheet, attaching a style sheet to and HTML document, external style sheets. Setting a default sheet language, making style sheets cascade, DIV and LAYER tags, introduction to XML, features and applications, data interchange with an XML document.

Unit-4
Java Script
Introduction, the document object, script tags, java script variables, operators, control flow and looping constructs. Function, arrays, forms, buttons, script event handlers.

Unit-5
Server side scripting
Introduction to server side scripting languages, introduction to ASP, active server objects, active server components, database management with ASP, development of interactive commercial sites using ASP.

Text Books:

1. Ivan Bayross, "Web Enabled Commercial Application Development using: HTML, DHTML, Java Script, Perl CGI", BPB
2. Evangelous Perroustsos, "Active Server Pages 3.0", BPB

References:

1. Web Publishing, D'Souza.
2. HTML Complete, BPB
3. David Hunter et al, "Beginning XML", Wiley Publications.
4. ASP Professional, Wrox Publications.