ACMT GROUP OF COLLEGES

DIPLOMA ENGINEERING COMPUTER SCIENCE

First Semester

S. No.	Name of Subject	Credits	Total Marks
1	English-I	4	100
2	Applied Mathematics	5	100
3	Applied Physics	5	100
4	Applied Chemistry	5	100
5	Business Communication	4	100
	Total	**23**	

Second Semester

S. No.	Name of Subject	Credits	Total Marks
1	Applied Mechanics	4	100
2	Engineering Drawing	4	100
3	Concepts in Information Technology	5	100
4	Basics of Mechanical Engineering	4	100
5	Workshop Technology	4	100
	Total	**21**	

Third Semester

S. No.	Name of Subject	Credits	Total Marks
1	English-II	4	100
2	Applied Mathematics-II	5	100
3	Introduction to Programming & C	4	100
4	Object Oriented Programming & C++	4	100
5	Computer Networks	5	100
	Total	**22**	

Fourth Semester

S. No.	Name of Subject	Credits	Total Marks
1	Data Structures Using C	5	100

2	Operating Systems	4	100
3	Database Management System	4	100
4	System Analysis & Design	5	100
5	Principle of Management	4	100
Total		**22**	

Fifth Semester			
S. No.	**Name of Subject**	**Credits**	**Total Marks**
1	English-III	4	100
2	Visual Basic	4	100
3	Computer Architecture	5	100
4	Multimedia Technology	5	100
5	Software Engineering	4	100
Total		**22**	

Sixth Semester			
S. No.	**Name of Subject**	**Credits**	**Total Marks**
1	Computer Graphics	5	100
2	Client Server Technology	5	100
3	Basic of Internet	5	100
4	Project Work	7	100
Total		**22**	

Total No. of Credits of Programme: -132

1. **Detailed syllabus: -**

First Semester

First Semester			
S. No.	**Name of Subject**	**Credits**	**Total Marks**
1	English-I	4	100
2	Applied Mathematics	5	100
3	Applied Physics	5	100
4	Applied Chemistry	5	100
5	Business Communication	4	100
Total		**23**	

Subject Name: English-I

1. **Functional Grammar:** Patterns & Parts of speech Subject, Predicate, Noun, Pronoun, Adjective, Adverb, Verb, Verb phrases, Conjunction, Interjection.
2. **Vocabulary:** Word formation, Prefix, Suffix, Compound words, Conversion, Synonyms, Antonyms, Homophones and Homonyms, How to look up a dictionary.
3. **Communication:** Meaning & importance of communication, Barriers to effective communication, Channels of communication, Language as a tool of communication.
4. **Requisites of Sentence writing:** Fragmented sentences, A good sentence, expletives, Garbled sentences, Rambling sentences, Loaded sentences, Parallel Comparison, Squinting construction, Loose & periodic sentences.

Subject Name: Applied Mathematics

5. Quadratic Equations
6. Arithmetic Progressions
7. Geometric Progressions
8. Partial Fractions
9. Permutations
10. Combinations
11. Binomial Theorem (For Positive Integral Index)
12. Binomial Theorem (For Fractional Index)
13. Measurement of Angles
14. Trigonometric Functions
15. Trigonometric Functions of Sum and Difference of Two Angles
16. Transformation Formulae
17. Trigonometric Functions of Multiple and Sub-Multiple Angles
18. Relations Between the Sides and the Trigonometric Ratios of the Angles of a Triangle
19. Area of a Triangle
20. Solution of Triangles
21. Cartesian Coordinates (Two Dimensions)
22. Locus
23. Straight Lines
24. Circles
25. Plotting of Curves
26. Translation of Axes
27. Parabolas
28. Ellipses
29. Hyperbolas
30. Polar Coordinates

Subject Name: Applied Physics

1. **Units and Dimensions:** Fundamental and Derived Units in SI System, Dimensions of Physical Quantities, Principle of Homogeneity Dimensional Equation, Applications of Dimensional Analysis: Checking the Correctness of Physical Equations, Derivation of Simple Physical Relations, Limitation of Dimensional Analysis, Significant Figures and Error Analysis.

2. **Force and Motion:** Scalars and Vectors, Velocity & acceleration, Equations of Motion, Newton's Law of Motion, Force & its Derivation from Newton's Laws of Motion, Composition and resolution of forces, Parabolic Motion Horizontal Projection and Projection at an angle, Time of Flight, Horizontal Range and Maximum Horizontal Range, Simple Problems, Centripetal Acceleration, Centripetal and Centrifugal Forces, Concept of Friction and its Application, Application to Banking of roads.

3. **Work, Power and Energy:** Work and its Units, Work Done on Bodies Moving on Horizontal and Inclined Planes (Consider Frictional Forces Also). Concept of Power and its Units, Calculations of Power (Simple Cases), Concept of Kinetic Energy and Potential Energy Expressions for P.E and K.E, Conservation of Energy in the Case of Freely Falling Bodies, Principle of Conservation of Energy.

4. **Rotational and Simple Harmonic Motions:** Definition of Moment of Inertia, Moment of Inertia of Disc, Ring, & Sphere, Torque and Angular Momentum and Their Inter Relation, Principles of Conservation (Angular Momentum and its Applications). Kinetic Energy of Rolling Body, S.H.M – Derivation of Displacement, Velocity, Acceleration, Time Period and Frequency, Motion of Cantilever, Free, Forced and Resonant Vibrations (No Derivation).

5. **Heat- Temperature and its Measurement:** Concept of Heat and Temperature on the Basis of K.E. of Molecules, Unit of Heat Basic Principles of Measurement of Temperature, Thermocouple, Bimetallic and Resistance, Pyrometers and Thermometers Criteria for the Selection of Thermometers.
6. **Expansion of Solids:** Coefficient of Linear, Surface and Cubical Expansions and Relation Amongst Them, Thermal Stresses (Qualitative Only) and their Applications.
7. **Heat Transfer:** Three Modes of Transfer of Heat, Coefficient of Thermal Conductivity, its Determination by Searle's Method and Lee's Disc Method, Conduction Through Compound Media (Series and Parallel for Two Materials Only), Heat Radiation, Characteristics of Heat Radiations, Prevost's Theory of Heat Exchange, Black Body Radiations, Emissivity and Absorptivity Kirchhoff's Law and Stefan's Law of Radiation.

Subject Name: Applied Chemistry
1. **Structure of Atom:** Chemistry as Important Branch of Science, Basic Concept of Elements Mixture and Compound, Chemical Equation, its Balancing, Implications and Limitations, Recapitulation of Fundamental Particles of Atom i.e., Electron, Proton and Neutron, Bohr's Model of Atom, Line Spectrum of Hydrogen, Modern Concept of Atom-Four Quantum Numbers, Shells, Subshells, Orbital (Shapes of s & p Orbital), Pauli's Exclusion Principle, Aufbau Energy Ranking Rule, Orbital Concept Types of bonds co-valency, formation of s-s, s-p, p-p, bonding with examples, Hybridization sp, sp^2, sp^3, (Consider BeF_2, BF_3, CH_4) molecules, Brief Concept of Modern Periodic Table of Elements.
2. **Chemical Equation, Oxidation & Reduction:** Concept of Oxidation & Reduction, Electronic Concept of Oxidation & Reduction, Redox Reactions (Direct and Indirect), Oxidation Number Balancing of Simple Redox Reactions by Oxidation Number.
3. **Ionic Equilibrium:** Ionization, Degree of Ionization, Focus Effecting Ionization, Ionization of Water, Ionization Equilibrium in Aqueous Solutions, Common Ion Effect.
4. **Acids and Bases:** Concept of Acids and Bases, Their Strength in Ionization Constant, PH Value, Acid Base Titration, Choice of Indicators, Hydrolysis, Buffer Solution.
5. **Electrolysis:** Concept of Electrolysis, Faraday's Law of Electrolysis, Engineering Applications (Electro-Metallurgy, Electroplating & Electro-Refining)
6. **Water:** Hard and Soft Water, Removal of Hardness by: Soda Lime Process, Permutit's Process, Ion Exchange Method., Disadvantages of Hard Water in Industrial User, Boiler Scales, Priming, Foaming Corrosion and Caustic Embrittlement, Expressing the Degree of Hardness of Water in (With Simple Problems): Clark's Degree, O' Hener's Method, Determination of Degree of Hardness by (With Simple Problems): Soap Titration Method, O' Hener's Method: Water for Drinking Purposes.
7. **Solutions & Colloids:** Solute, Solvent, Solution & Colloids, Particle Size and Colloidal State, Tyndell Effect, Brownian movement, Coagulation.

Subject Name: Business Communication
1. **Corresponding: (Official, Business and Personal):** One Letter from Each Category.
2. **Grammar:** Tenses, Narration, Punctuation.
3. **Essay.**
4. Reports.
5. Notices.
6. Note-Making and Summarizing.
7. Business Correspondence.

Second Semester

Second Semester			
S. No.	Name of Subject	Credits	Total Marks
1	Applied Mechanics	4	100
2	Engineering Drawing	4	100
3	Concepts in Information Technology	5	100
4	Basics of Mechanical Engineering	4	100
5	Workshop Technology	4	100
	Total	**21**	

Subject Name: Applied Mechanics

1. **Introduction:** Concept of Mechanics and Applied Mechanics, Explanation of Mechanics and Applied Mechanics, Its Importance and Necessity, Giving Suitable Examples on Bodies at Rest and in Motion, Explanation of Branches of this Subject, Concept of Rigid Bodies.

2. **Laws of Forces:** Force and its Effects, Units and Measurement of Force, Characteristics of Force Vector Representation, Bow's Notation, Types of Forces, Action and Reaction, Tension, Thrust and Shear Force, Force Systems: Coplanar and Space Force Systems, Coplanar Concurrent and Non-Concurrent Forces, Free Body Diagrams, Resultant and Components Concept of Equilibrium, Parallelogram Law of Forces, Equilibrium of Two Forces, Superposition and Transmissibility of Forces, Newton's Third Law, Triangle of Forces, Different Cases of Concurrent Coplanar, Two Force Systems, Extension of Parallelogram Law and Triangle Law to Many Forces Acting at One Point-Polygon Law of Forces, Method of Resolution into Orthogonal Components for Finding the Resultant, Graphical Methods, Special Case of Three Concurrent, Coplanar Forces, Lami's Theorem.

3. **Moments:** Concept of Moment, Varigon's Theorem- Statement Only, Principle of Moments- Application of Moments to Simple Mechanism, Parallel Forces, Calculation of their Resultant, Concept of Couple Properties and Effect, Moving a Force Parallel to its Line of Action, General Cases of Coplanar Force System, General Conditions of Equilibrium of Bodies Under Coplanar Forces.

4. **Friction:** Concept of Friction, Laws of Friction, Limiting Friction and Coefficient of Friction, Sliding Friction.

5. **Centre of Gravity:** Concept of Gravity, Gravitational Force, Centroid and Center of Gravity, Centroid for Regular Lamina and Center of Gravity for Regular Solids, Position of Center of Gravity of Compound Bodies and Centroid of Composition Area, CG of Bodies with Portions Removed.

6. **Laws of Motion:** Concept of Momentum, Newton's Laws of Motion, Their Application, Derivation of Force Equation from Second Law of Motion, Numerical Problems on Second Law of Motion, Piles, Lifts, Bodies Tied with String, Newton's Third Law of Motion and Numerical Problems Based on it, Conservation of Momentum, Impulsive Force (Definition Only).

7. **Simple Machines:** Concept of Machine, Mechanical Advantage, Velocity Ratio and Efficiency of a Machine, their Relationship, Law of Machine, Simple Machines (Lever, Wheel and Axle, Pulleys, Jacks Winch Crabs Only).

Subject Name: Engineering Drawing

1. **Drawing Office Practice:** Importance of Engineering Drawing, Importance of Legible Lettering and Numbering, Dimensioning, Scales, Geometrical Construction, Conics, Geometric Curves.

2. **Orthographic Projections, Projection of Simple Objects in three views.**

3. **Projection of Solids and Section of Solids:** Projection of Simple Solids, Sectional View.

4. **Pictorial Drawing:** Isometric Drawings.

5. **Development of Surfaces.**

6. **Practice on AutoCAD:** AutoCAD Commands, Exercise.

Subject Name: Concepts in Information Technology

1. **Information Concepts & Processing:** Definition of Information, Data VS Information, Introduction to Information System, Information Representation Digital Media, Images, Graphics, Animation, Audio, Video etc. Need a Value & Quality of Information the concept of Information entropy & Numerical.
2. **Computer Appreciation:** Definition of electronic Computer, History, Generation, Characteristics & Application of Computers, Classification of Computers, RAM, ROM, Computer Hardware, CPU, Various I/O Devices, Peripherals, Storage Media, Software Definition and Concepts.
3. **Data Communication & Networks:** Computer Networks, Networking of Computers, Introduction to LAN, WAN, MAN, Network Topologies, Basic Concepts in Computer Networks, Introduction to GPRS, CDMA, GSM & FM Technologies.
4. **Introduction to Internet Technologies:** HTML, DHTML, WWW, FTP, TELNET, Web Browser, Net Surfing, Search Engines, E-Mail, ISP, E-Commerce, Public Key, Private Key, Safety of Business Transaction on Web.
5. **Concepts in Operating System:** Elementary Concepts in Operating System, GUI, Introduction to DOS, MS Windows.

Subject Name: Basics of Mechanical Engineering
1. **Source of Energy:** Introduction, Types of Energy.
2. **Steam and its Properties:** Introduction to Steam, Terms Related to Steam Formation.
3. **Boiler:** Classification of Boilers, Merits and Demerits, Boiler Mounting.
4. **Prime Movers:** Definition of Prime Movers, Impulse and Reaction Turbines, Open and Close Cycle Gas Turbine.
5. **Internal Combustion Engines:** Heat Engine, External and Internal Combustion Engine, Classification of IC Engines, Principle Parts of IC Engines.
6. **Refrigeration and Air Conditioning:** Types of Refrigeration System, VCRS, Air Conditioning.
7. **Welding, Soldering and Brazing:** Welding, Classification of Plastic and Fussion Welding, Arc Welding, Types of Electrode, Brazing and Soldering.
8. **Machine Tools:** Introduction, Classification of Lathes, Major Parts of a Lathe, Specification of Lathe, Drilling Machine Operations, Milling and Down Milling, Grinding Machines.
9. **Lubrication and Bearings:** Introduction to Lubrication, Function and Properties of Lubricants Classification of Bearings.
10. **Power Transmission:** Belt Drives, Belt Material, Gear Train, Types of Gears, Compound Gear Train.
11. **Mechatronics:** Concept of Mechatronics System, Elements of Measurement System, Types of Control Systems, Microprocessor Based Controllers.

Subject Name: Workshop Technology
1. **Carpentry and Painting Shop:** Introduction to Wood Work, Preparation of Dovetail Joint, Preparation of Mitre Joint, Preparation of Lengthening Joint etc...
2. **Fitting Shop:** Drill, Taps and Dies, Using a Hand Tap, Care and Maintenance of Measuring Tools, Height Gauge, Files, Preparation of Job Involving Threads, Using a Pipe Threading Set, Care of Pipe Cutters and Threading Sets.
3. **Welding Shop:** Gas Welding, Operation and Maintenance of Oxygas Equipment, Equipment Setup, Maintaining the Equipment, Oxygas Welding Techniques, Common Welding Joints Generally Made by Gas Welding, Proper Edge Preparation and Fit Up, Welding Procedure.
4. **Electric Shop:** Importance of Three Phase Wiring and Its Effectiveness, Two-Wattmeter Method of Power Measurement in a Three Phase Circuit, Connecting Single Energy Meter and testing it, Reading and Working out the Power and costing of Energy in a Single Phase Circuit.
5. **Electronic Shop:** Wire Rope, Various Types of Plugs, Sockets, Connectors Suitable for General Purpose Audio Video Use, Demonstrate the skill to make Facilities Solder Joint, Installation and Soldering of

Printed Circuit Components, Soldering of PCB Components, Application of Solder and Soldering Iron Tip.

Third Semester

Third Semester			
S. No.	Name of Subject	Credits	Total Marks
1	English-II	4	100
2	Applied Mathematics-II	5	100
3	Introduction to Programming & C	4	100
4	Object Oriented Programming & C++	4	100
5	Computer Networks	5	100
	Total	22	

Subject Name: English-II

1. **Functional Grammar:** Articles, Preposition, Tenses: Functions, Synthesis, Transformation, Spotting errors and correction of sentences.
2. **Pre- Requisites of Technical written Communication:** One word substitution, Spelling rules, Words often confused & misused, Phrases.
3. **The Structure of sentences/ clauses:** Adverb clause, Adjective clause, Noun clause. Sentences: Simple, Double, Multiple and complex, Transformation of sentences: simple to complex & vice versa, simple to compound & vice-versa, Interrogative to assertive &to negative & vice-versa.
4. **Technical Communication:** Nature, Origin and Development, Salient features, Scope & Significance, Forms of Technical Communication, Difference between Technical Communication & General writing, Objective Style vs. Literary Composition.

Subject Name: Applied Mathematics-II

1. **Complex Numbers:** Complex Numbers, phasor and Application of Complex Number in R.L.C. Circuits.
2. **Differential Calculus:** Functions and Limits, Differentiation, Approximation of Errors by Differentials.
3. **Integral Calculus:** Indefinite Integral, Definite Integrals, Area Bounded by a Curve and Axes, Average Value and Root Mean Square Value of a function, Finite Differences and Numerical.
4. **Partial Differentiation:** Partial Differentiation.
5. **Solution of Ordinary Differential Equations:** Differential Equations, Linear Differential Equations, Applications of Differential Equations to R-L-C Electric Circuits.

Subject Name: Introduction to Programming & C
Unit-I

1. **Introduction to computer system:** Introduction, Characteristics of computer, Drawbacks of computers, Generations of Computers
2. **Computer Organization:** Architecture of Computer System
3. **Number System:** Introduction, Commonly Used Number System, Decimal, Binary, Octal, Hexadecimal, Converting from one number system to another
4. **Binary Arithmetic:** Introduction, Binary Addition, Subtraction, Multiplication, Division, Representations of characters, BCD Code, EBCDIC, ASCII, Fixed Point Representation, Floating Point Representation

5. **Algorithms and Flowchart:** Algorithms, Characteristics of algorithms, Flowchart, Different Symbols used in Flowcharts.
6. **Computer Languages:** Machine Language, Advantages of Machine Language, Disadvantages of Machine Language, High Level Language, Assembly Language, Software, Type of Software, System Software, Application Software
7. **Input-output Devices:** Introduction, Offline Input Devices, Online Input Devices, Punched Cards, Keyboards, Mouse, Touch Pad, Light Pen, Scanner
8. **Storage Devices:** Introduction, Primary Memory, RAM, DRAM, ROM, PROM, EPROM, Cache Memory, Secondary Memory, Magnetic Tape, floppy, Hard Disk, CD-ROM
9. **Operating System:** Introduction, Type of Operating System, Batch Processing Operating System, Single-user Operating System, Multi-User Operating System, Multi-Processing Operating System, Real Time Operating System, DOS, Functions of DOS
10. **Viruses:** Introduction, Types of Viruses, Antivirus

Unit-II
1. **An introduction to C:** History of C, Feature of C, Structure of a C program, Variables and Data Types, Arithmetic Expressions
2. **Components of C Language:** Character Set, C token, Data Type in C, Operators, Type Casting, Data Conversion
3. **Input / Output Functions:** Formatted Input / Output functions, The print function, The scanf Function, Unformatted Input / Output Function, Character Input / Output Function, String Input / Output Functions
4. **Conditional Statement:** Introduction, If-else statement, Nesting If-else Statement, The switch Statement
5. **Looping:** Introduction, While Loop, Do While Loop, Nesting Loop, The Break Statement, The Continious Statement
6. **Arrays in C:** Array, Two Dimensional Arrays, Passing Array as Parameters, String, Some Library Function for String Handling
7. **Function:** Modular Programming, Top-Down Approach, Structured Programming, function with no Argument and no Return Value, Function Prototype, Storage class in C, Declaring Variables of Specified Storage Classes, Local and Global Variables.
8. **Pointer in C:** Pointer, Passing Pointers as Parameters, Dynamic Memory Allocation, Pointer to Pointer, Pointer to Function.
9. **Structure and Union:** Structure, Array of Structure, Pointer to Structure, Nested Structure, Structure and Function, Difference between Structure and Union.
10. **File Handling in C:** Introduction, Difference between Text and Binary File, Basic File Handling Functions, File Input / Output.
11. **Preprocessor:** Introduction, Functions of a C Preprocessor.

Subject Name: Object Oriented Programming Using C++
1. OOP paradigm , Advantages of OOP , Comparison between Functional Programming and OOP approach, characteristics of Object oriented Language objects, Class, Inheritance, Polymorphism, and abstraction, encapsulation, Dynamic Binding, Message passing.
2. Introduction to C++, Identifier and keywords, constants, C++ Operators, Type Conversion, variable declaration, Statement, expressions, User defined data types, Conditional expression (For, While, Do-while) loop statement , breaking control statement (Break, Continue).
3. Defining a function, type of functions, Inline functions, Call by value and Call by reference, Preprocessor, Header files and standard functions, Structures, Pointers and structures, Unions, Enumeration. **Classes**, Member functions, Objects, Array of objects, Nested classes, Constructors, Copy Constructors,

Destructors, Inline member functions, Static class member, friend functions, Dynamic memory allocation.

4. Inheritance: Single inheritance, Multi-level inheritance, hierarchical, Virtual base class, Abstracts classes, Constructors in Derived classes, nesting of classes.

5. Function overloading , Operator overloading, polymorphism, Early binding, Polymorphism with pointers, Virtual functions, Late binding , Pure virtual functions, Opening and closing of files, Stream member function , Binary file operations, Structure and file operations, classes and file operations, Random access file processing.

Subject Name: Computer Network

1. **Introduction to Computer Networks:** Introduction, User of Networks: Goals and applications, OSI Reference Mode, Novell Netware, ARPANET, NSFNET, The Internet.

2. **The Physical Layer:** Transmission media, Twisted Pair, Baseband and Broadband Coaxial Cable, Fiber Optics, Wireless Transmission, Radio Transmission, Microwave Transmission, Infrared Transmission, Light Wave Transmission, ISDN Services, Virtual Circuits verses Circuit Switching, Transmission in ATM Network, Paging System, Cordless Telephone, Cellular Telephone, Communication Satellite.

3. **The Data Link Layer:** The data link Layer, Framing , Error Control, Flow- Control, Error Detection and Correction Protocols, Simplex Stop and Wait Protocols, One Bit sliding Window, Using Go- Back n, the Data link layer in the internet.

4. **The Medium Access Sub – Layer:** The Medium Access Sub Layer , Framing Static and Dynamic Channel Allocation in LAN and MANs ,IEEE standard 802.3 and Ethernet, IEEE standard 802.4 and Token Bus, IEEE 802.4 and Token Ring; Bridges, Bridges form 802x to 802y, Transparent Bridges, Source Routing Bridges.

5. **The Network Layer:** The network layer , network layer Design Issues, shortest Path routing, Flooding, Flow Based Routing , Broadcast Routing, Congestion Control and Prevention Policies, Internet Working, Connectionless Internet Working , Tunneling Internet Work Routing, Fragmentation, Firewalls, IP Address Internet Control Protocols.

6. **The Transportation Layer:** The transportation Layer, The Transport Service, Transport Protocols, Addressing,, Establishing a Connection, Releasing a Connection, The Internet Transport Protocols, TCP.

7. **The Application Layer:** The Application layer, Network Security, Electronic mail, working of e-mail.

Fourth Semester

Fourth Semester			
S. No.	Name of Subject	Credits	Total Marks
1	Data Structures Using C	5	100
2	Operating Systems	4	100
3	Database Management System	4	100

4	System Analysis & Design	5	100
5	Principle of Management	4	100
	Total	**22**	

Subject Name: Data Structures Using C

Unit-I

Basic Concepts

1. **Fundamental:** Data Structures, Algorithms and various types of applications.
2. **Basic Data Types**: Stack, Lists a7 recursion.

Unit-II

Trees & Sets

1. **Trees:** Definition and implementation of binary tree, tree traversal, postfix, prefix notations, heap.
2. **Sets:** Definition and Implementation of hash table, priority queues.

Unit-III

Algorithms & File Structure

1. **Sorting Algorithms :** Quick sort, insertion sort, Bubble sort, merge sort
2. **Searching Algorithms:** Linear search, Binary search, depth first search and Breadth first search techniques.
3. **File Structure:** Sequential, Index Sequential file Structure.

Subject Name: - Operating Systems

1. **Operating System Overview:** Introduction, Objectives and functions, Basic Elements, Evolution of Operating System, Instruction Execution, Interrupts, Memory, Memory Hierarchy, System Components, Operating system Services, System Calls, Virtual Machines, System Design and Implementation.
2. **Process Concepts:** Introduction, Process States, Process Control Block (PCB), Process Scheduling, Co-operating Processes, Threads, Inter Process Communications (IPC).
3. **CPU Scheduling:** Scheduling Criteria, Types of Scheduling, Scheduling Algorithms, Multiple-processor Scheduling, Real-time Scheduling, Disk-Scheduling Policies.
4. **Memory Management:** Introduction, Memory –management Requirements, Logical and Physical Address Space, Swapping, Loading Programs into main memory, Paging, Page Replacement Algorithms, Allocation Of Frames, Translation Look Aside Buffer (TLB), Simple Segmentation with Paging, page Size, Thrashing.
5. **File System:** Introduction, File Organization and Access Methods, Directory Structure, Protection, Security Threats, Intruders, Viruses, File-System Structure, File Allocation Methods, Free-Space Management, Directory Management, Efficiency and Performance of Secondary Storage.
6. **Deadlocks:** Introduction, Principles, Principles Of Deadlocks, System Model, Deadlock Characterization, Resource- allocation Graphs, Methods For Handling Deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection on, Recovery from Deadlock.
7. **Process Management and Synchronization:** Introduction, Critical Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors, Message Passing.

Subject Name: Database Management System

1. **Basic - Concepts of Database Systems:** Database Schema, Instance and Database state, The Three-Schema Architecture, Data Independence, DBMS Languages, People Deal with Databases.

2. **Entry - Relationship Model:** The E- R Model, Entity Relationship Diagram, Entity sets & relationships sets, Attributes, Integrity Constraints-Entity Integrity Constraints, Referential Integrity Constraints, key in entiy& relationship sets: super key, candidate key, primary key, and unique key.
3. **Data Models and Its Implementation:** The Hierarchical Data Model, the Network Data Model, Network Modeling Concepts, the Relational Model.
4. **Oracle: A Relational Database Management System** Oracle System Structure,. Oracle Server, Oracle Database Structure, Oracle Schema Objects, Oracle Data Dictionary.
5. **Structured Query Language: SQL:** Three Parts of SQL, Sub-Queries, Referential Integrity, DDL, DML. DCL Command.

6. **Relational Algebra and Relational Calculus:** Relational- Oriented Operation, Set-Oriented Operations and Union Compatibility, Aggregate Function and Grouping, Tuple Relation Calculus.
7. **Normalizing Database:** Benefits of Normalization, Pitfalls in relational database, Function Dependency, Lossless Join and Dependency Preservation, Importance of normalization-1st NF, 2nd NF, 3d NF and comparison with each other.
8. **Database Design and Tuning:** The Database Design Process, Requirements and Analysis, Choice of DBMS, Logical Database Design, Database Implementation and Tuning.
9. **Query Processing and Query Optimization:** Query Processing, Query Optimization, Heuristics Rules in Query Optimization, Information used in Cost Function.
10. **Database Recovery Techniques:** Classification of Transaction Failures, Recovery Techniques Base on Deferred Update, Recovery Techniques Base on Immediate Update, Buffer Management.
11. **Concurrency Control Techniques:** The Acid Test for Transaction Management, Binary Locks, Serializability by Two-Phase Locking, Deadlock Problem.
12. **Data Warehousing:** Data Warehouse Definition, Data Form Legacy Systems, Decision- Support and Executive Information Systems.
13. **Data Mining and Web Mining:** Data Mining Techniques, Future Direction of Data Mining, Data Mining Techniques for Web Searching.
14. **Object- Oriented Database:** History Of OODBMS, Need for Abstract Data Types, O-O Features in SQL3, Hypertext Databases.
15. **Distributed Database:** Structure of Distributed Database, Design of Distributed Database, Advantage of Distributed Database, DDBMS Prototypes.

Subject Name: System Analysis and Design
Unit-I
1. **System Definition and Concepts:** General Theory systems, Manual and automated systems, Real- life business Sub - Systems. System environment and boundaries. Real - time and distributed systems. Basic principles of successful systems. Approach to system development: Structure system analysis and design, Prototype, Joint application development.
2. **System Analyst:** Role and need of system analyst. Qualifications and responsibilities. System analysis as a profession.
3. **System Development Cycle:** Introduction to Systems Development Life cycle (SDLS). Various phases of SDLS: Study, Analysis, Design, Development, Implementation, Maintenance.
4. **Systems documentation consideration:** Principles of systems documentation, types of documentation and their importance, enforcing documentation discipline in an organization.
5. **System Planning:** Data and fact gathering techniques: Interviews, group Communication - questionnaires, Presentations and visits. Assessing project feasibility: Technical, Operational, Economic, Cost benefits analysis, Schedule, Legal and contractual, Political. Modern methods for determining

system requirement: joint application, Development program, prototyping, Business Process re-engineering. System selection plan and proposal.

6. **Modular and Structured Design:** module specifications. Top-down and bottom-up design. Module coupling and cohesion. Structure charts.

7. **System Design and Modeling :** Process modeling , Logical and Physical design Conceptual Data modeling Entity- relationship analysis, Entity -relationship modeling, ERDs and DFDs, Concepts of normalization. Process description: Structured English, Decision tree, Decision tables. Documentation: Data dictionary, Recording data

8. **Input and Output:** Classification of forms, Input/output forms design. User-interface design, Graphical interfaces. Standards and guideline for GUI design. Designing physical files and databases: Designing field, Designing physical record, Designing Physical files, Designing database. Introduction to CASE tools, Feature, Advantages and Limitations of CASE tools, Awareness about some commercial CASE tools.

9. **System Implementation and Maintenance:** Planning consideration Conversion methods, Procedures and Controls. System acceptance criteria. System evaluation and performance. Testing and Validation. Preparing user manual .Maintenance activities and issues.

10. **Computer System Audit and Security:** Audit of Computer system usage. Types of threats to computer system control measures: Threat and risk analysis, Disaster recovery and contingency planning, viruses.

11. **OO Analysis/ Design:** Introduction to UML OO development life cycle and modeling .Static and dynamic modeling. Comparison of OO and module-oriented approach. Modeling using UML.

12. **Introduction to Management Information System (MIS) :** Meaning and role of MIS. System approach to MIS. Types of information systems: Transaction processing system, Management information system Decision support system, Expert system case studies (Illustrative) : MIS for accounting and function, MIS for marketing system.

Subject Name: Principle of Management
Unit-I
Planning and Organizing Management

1. **Definitions of Management:** Its Nature and Purpose, Management as a Science and art, the Elements of Science, Patterns of Management Analysis-Systems Approach to Operational Management. Function of Managers. Management and Society - Social Responsibility and Ethics with Reference to India and EN India. Operating in a pluralistic Society, Social Responsibility of Managers, ethic s in Managing. A Broad Overview of the Different Forms of Business Enterprises in India.

2. **Nature and Purpose of Planning:** Types of Plans; Steps in Planning Process - A Rational Approach to Goal Achievement. Objectives - The Nature of Objectives, Evolving Concepts in Management by Objectives (MBO), the Process of MBO, Setting Objective, Benefits and Weakness of MBO. The Nature and Purpose of strategies Planning Process , The TOWS Matrix, The Portfolio Matrix , Major Kinds of Strategies and policies, The Three Generic Competitive Strategies by Porter, Effective Implementation of Strategies , Premising and forecasting. Decision Making - The Importance and Limitations of Rational Decision Making, Evaluation of Alternatives, Selecting a Alternative, Programmed and Non-Programmed Decision , Decision Making Under Certainty , Uncertainty and risk, Modern Approaches to Decision Making under Uncertainty, Evaluating the Important for a Decision , Other Actor in Decision Making, Decision Support System , Systems Approach and Decision Making.

3. **Nature and Purpose of Organizing:** Formal and Informal Organization, Organizational Division - The Department, Organization Levels and the span of management, factors Determining an Effective span, organization Environment for Entrepreneur and Entrepreneur, The Structure and process of Reorganizing.

Department by Simple Members, By time, by Enterprise function, by Territory or Geography , by Customer ,By Process or Equipment, and by Product. Matrix Organization, Strategic Business Units, Choosing the Pattern of Departmentation. Authority and Power, Line and staff concepts, Functional Authority, Benefits and Limitations of staff, Decentralization and Delegation of Authority, art of Delegation, Balance as a key to Decentralization.

Unit-II
Functional Methodology

1. **Human Resource Management and Selection :** Definition of Staffing, Defining the managerial job, Systems Approach to HRM- an Overview the Staffing function, Situational Factors Affecting Staffing , Selecting - Matching the Person with the job, Systems Approach , Position Requirements and job Design, Skills and Personal Characteristics Required by Managers, matching Qualifications with position Requirements, Selection-Process, Techniques and Instruments, Orienting and Socializing New Employees. Performance Appraisal -- Purposes and user of appraisal, Problem of Management Appraisal choosing The Appraisal Criteria, Traditional Trait Appraisals, Apprising Managers against Verifiable Objectives, Appraising Managers As Managers, Rewards and Stress of Managing, Formulating the Career Strategy. Manager Development Process and Training, Approaches to Managers Development, On -The- Job training and internal and external Training, Managing Changes, Organizational Conflict, Organizational Development.
2. **Controlling The Basis Control Process:** Critical Control points and Standards, Control as a Feedback System, real-time Information and control Feed Forward Control, requirements for Effective Controls. Budget- Traditional non-budgetary Control Devices, Time-even Network analysis, information technology, use of Computers in handling information, Challenges created by information technology. Control of Overall Performance, budget Summaries and report, Profit and loss Control, Control through return on investment, Direct Control v/s Preventive Control, Developing Excellent Mangers.

Fifth & Sixth Semester

Fifth Semester			
S. No.	Name of Subject	Credits	Total Marks
1	English-III	4	100
2	Visual Basic	4	100
3	Computer Architecture	5	100
4	Multimedia Technology	5	100
5	Software Engineering	4	100
	Total	22	

Subject Name: English-III
1. **The Seven C's of the Effective Communication:** Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness.
2. **Communication:** Its interpretation: Basics, Nonverbal Communication, Barriers to Communication.
3. **Business Communication at Work Place:** Letter Components and Layouts, Planning a letter, Process of Letter writing, Email Communication, Memo and Memo Reports, Employment Communication, Notice Agenda and Minutes of Meeting, Brochures.
4. **Report Writing:** Effective Writing, Types of Business Reports, Structure of Reports, Gathering Information, Organization of the Material, Writing Abstracts and Summaries,Writing Definitions,Visual Aids, User Instruction Manual.
5. **Required Skills:** Reading Skills, Note-making, Précis Writing, Audio Visual Aids, Oral Communication.

6. **Mechanics of Writing:** Transitions, Spelling Rules, Hyphenation, Transcribing Numbers, Abbreviating Technical and Non-Technical Terms, Proof Reading.

Subject Name:-Visual Basics
1. **Introduction to Visual Basics:** Object-Oriented Programming (OOP), What Is the Visual Basic ?, Visual Basic Application, Introduction to Visual Basic , Event-Driven Programming, Integrated Development Environment(IDE), Toolbox, Form Layout Window, Properties Window, Menu Bar, Immediate Window, Creating the interface, Resizing, Moving , and Locking Controls, To Lock all Control Positions, To Adjust the Position of Locked Controls, Setting Properties, Designing a form, Saving the Project, Working with Multiple Projects, Merging Text, Using Wizard and Add-Ins, Using Wizards, Making and Running an Executable File Adding Controls, OLE, Command Button.
2. **Data Types In Visual Basics:** Data Type, Operator, Precedence of Operators, Arrays.
3. **Controls Statements in Visual Basic:** Introduction to Control Statements, Decision Structures or Selection Statements, More Worked Out Programming Examples.
4. **Standards Library Functions in Visual Basics:**Introduction, Characters and Strings, String Data Types, Concatenation of Strings, Concatenation Operator (& Operator), Arithmetic Operators, String Functions, Numeric Functions, Date, Time and Now Functions, Date Arithmetic Functions (Date Add, Data Diff), Data Type Functions, Arithmetic Functions, Remainder.
5. **Visual Basic Forms, Procedures and Functions:** Introduction, to Forms, Single Documents Interface (SDI), Multiple Document Interface (MDI), Managing Projects, Using Procedures and Functions, Procedures, Calling Sub Procedures, Calling Function Procedures, Passing Arguments to Procedures, Using Optional Arguments.

Subject Name:-Computer Architecture
1. **Processor Organization:** General structure of CPU registers, Stack, operation of stack, ALU and control unit. Instruction format, mathematical operations, fixed point addition, multiplication or division. Principle of arrays and pipeline processors, principle of instruction decoding and implementation, hardwire and micro-instruction based control unit.
2. **Design of Controller:** Identifying micro-instruction, minimizing micro-instruction, size, parallelism in micro instruction, encoding control instruction, timing cycle and clock generation, organization of micro-Programme based control unit.
3. **Memory Organization:** Static memory, dynamic memory, memory hierarchies, memory refresh, paging concept of memory compaction, interleave memory and principle of address interleaving associative memory, memory segmentation, block address calculation, concept of cache memory.
4. **Data Transfer Technique:** Various I/O devices, IOP, CPU configuration

Subject Name-Multimedia Technology
Unit-I: Introduction and Hardware:
Definition Of Multimedia, CD-ROMs and Multimedia applications, Multimedia requirements –Hardware, Software, Creativity and Organization, Multimedia skills and training Macintosh Verses PC, the Macintosh platform, PC platform, Connections, Memory and storage devices, input devices, Output hardware ,Communication devices.
Unit-II: Multimedia Software:
Basic tools, painting and drawing tools, OCR software, Sound editing programs, Animation devices and digital movies and other accessories, Linking multimedia objects , Office suites, word processor, spreadsheets presentation tools, Types of Authoring tools card and page based, icon based and time based authoring tools, Object oriented tools.
Unit-III: Production Building Blocks:
Test-Using test in Multimedia, Computers and Text, Font editing and design tools, Hypertext, Sounds-

multimedia system sounds MIDI Verses Digital Audio, Audio file Formats, Working with sound in Windows, Notation interchange file format (NIFF),Adding sound.

Unit-IV: Production Tips:

Image-Creation, making still images, images colors, Images, File format, Animation-principles of animations, making workable animations Video, using video, Broadcast Video, Standard, Integrating Computer and TVs, Shooting and editing Video, Using Recording formats, Video tips, Video Compression.

Unit-V: Multimedia Project Development and case Studies:

Project planning, Estimating, RPFs and Bid proposals, Designing, Producing acquiring and using contents, Using Telnet, Testing, Preparing for delivery , CD-ROM Technology and Standards. Designing for the Word Wide, Working on the Web, Text for the Web, Images for the Web, and Animation for the Web.

Subject Name-Software Engineering

1. The Software Problem
2. Software Process
3. Software Requirements Analysis and Specification
4. Software Architecture
5. Planning a software project
6. Design
7. Coding and Unit Testing
8. Testing

Sixth Semester

Sixth Semester			
S. No.	Name of Subject	Credits	Total Marks
1	Computer Graphics	5	100
2	Client Server Technology	5	100
3	Basic of Internet	5	100
4	Project Work	7	100
Total		**22**	

Subject Name-Computer Graphics

1. Keyboard, Touch Panel, Light pens, Graphic tablets, Joysticks, Touch balls, Image scanner, Mouse, Handy copy device:-Zero impact and Non-Impact printers, Dot matrix, Laser printer, Inkjet printer, Dectrostate, Flatted and drum plotters. Video display devise:-Cathode Rey tube, Resistance, Resolution ,Aspect ratio vertical and horizontal ,Color CRT monitors, Direct view storage tube, Flat panel displays, LCD Virtual reality, Faster scan system, Random scan system. Memory device:-Memory (RAM, ROM), CD, Floppy disk, Magnetic tapes, Magnetic disks.

2. Scan conversion algorithm for line (DDA &Bresenham's algorithm) ,Midpoint circle ,Circle & ellipse, Midpoint ellipse, Midpoint ellipse ,Bresenham's algorithm ,Area filling techniques, Scan line polygene fill, Boundary fill character generation.2-dimensional Graphics: Cartesian & Homogeneous coordinate system, Geometric transformations, Affine transformation (Translation, Scaling ,Rotation, Reflection, Shearing),Composite transformation ,Affine Viewing pipeline, Two dimensional viewing transformation and clipping(Line, Polygon and Text).

3. Three Dimensional Graphics:-Geometric transformation (Translation, Scaling, rotation, reflection, shearing), Composite transformations, Mathematics of projections (parallel & perspective), View pipeline, 3D viewing transformations and clipping (normalized view volumes, view port, clipping).

4. Hidden line and surface elimination algorithms, Z-buffer, Scan-line, Sub-division, and Painter's algorithm. Illumination Models: Diffuse reflection, specular reflection, refracted light, Texture surface patterns, half toning, dithering. Surface rendering methods: Constant intensity method, Gourmand shading, Hong shading. Color Model: Introduction to RGB, CMY & HSV color models.

Subject Name-Client Server Technology

1. **Introduction:** Client Server Technology, Evolution Of Architectures, Thin Characteristics, General Issues In Client-Server Computing, Overview Oracle Distributed Database System, Other Issues in Client-Server Computing Development, Applying Client/Server In Businesses.
2. **Client-Server Technology and Heterogeneous Computing:** Categories Of Clients, Clients/Server Systems, The Role Of The Server, Single-System Image, Client/Server Software Architectures-an Overview, Technical Detail, Mainframe-Centric Client/Server Computing, Client Server Development Tools Samson Kifle Is, Client/Server Development Tools.
3. **The Evolution of Client/Server Computing and Architectures:** Tier Architectures, Tier Architectures-Tier Architectures.
4. **Interaction of Client and Server Communication Techniques and Protocols:** Network, Network Structure, Protocol, Hardware, Cabling, Topology, Star Network Operating Sys Tem Software. **Distributed Systems:** Distributed System Model.
5. **UNIX Client Server Technology:** Understanding the Role of UNIX, General Overview and Structure, UNIX Components, Impact/Contributions.
6. **Database Management Systems:** What is database management systems ,Peoples who deals with database, Overall system structure ,Cgdp's 12 rules'' fdr a fully ralatios DBMS, The role of DBAa in dbms,pl/sql, operators, Fundamental SQL commands, Data definition command of sql, program, is null operator, Alter table ,Aggregate functions ,Controls structure ,introduction to stored procedures.
7. **Basic UNIX and Shell Programming:** Unix Operating System ,History Of Unix, Features Of Unix ,Kernel, Process Managements ,File Systems ,Unix ,Kernel, Process Managements ,File System, Unix Commands, Files &Directories ,General Purpose Utilities, Compression Utilities ,Processes ,She 11Phoqw.
8. **CPU/Process Scheduling:** Goals of Scheduling (objectives) ,Preemptive Vs N On Preemptive Scheduling
9. **Unit-10-Memory Management:** Memory Management, Principles of Virtual Management, Memory, Memory Management in Ms-DOS

Subject Name: Basics of Internet
Unit-I: Internet Technology
1. **Evolution & Protocols**: Internet Evolution, Protocols, Interface Concept, Internet V.s. Internet growth of internet ISP, Connectivity - dial up, leased line, VSAT etc. URLs. Domain names, Portals, Application E-mail File Transfer Protocol, Telnet, Chatting, Data Transmission Protocol, Client/Server, architecture and its characteristics, FTP and its Usages. Telnet Concepts, remote logging, protocols, terminal emulation, message board, Internet Chatting, Voice chat, Text chat.
2. **Web Concept**: World Wide Web, Web Publishing, HTML, Design tools, HTML edition, Image edition, Issue in website creation & maintenance FTP s/w for uploading Use of frames and forms in web pages.

Unit-II: E-Commerce
1. **Introduction to E-Commerce:** Introduction, Concept technology in E-Commerce, Internet business, Advantage of E-Commerce, Application, Feasibility and constrain.

Subject Name: -Project Work