Mahatma Gandhi University
MEGHALAYA
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SYLLABUS MANUAL

INFORMATION TECHNOLOGY PROGRAMME

PROGRAMME CODE --- 210203
BACHELOR OF COMPUTER APPLICATION (BCA)

CODE	SUBJECT	CREDIT
ITP11	Introduction to Information Technology	4
ITP12	Programming in C	4
ITP13	RDBMS	4
ITP14	Operating Systems	4
ITP15	Web Technology	4
ITP16	Unix with Shell Programming	4
ITP17	Communication Skills	4
ITP18	Basic Mathematics	4
ITP19	Principles of Management	4
ITP20	Operation research	4
ITP21	Enterprise Recourse Planning(ERP)	4
ITP22	Computer Networks	4
ITP23	Management Information System	4
ITP24	Software Engineering	4
ITP25	Introduction to Microprocessor	4
ITP26	Desktop Publishing	4
ITP27	Data Structure with C	4
ITP28	C# with .Net	4
ITP29	Java Programming	4
ITP33	Practical-ITP 12	4
ITP34	Presentation/Seminar	10
ITP35	Project Program Work	10

Bachelor of Computer Application (BCA)

The UG Degree consists of 25 Subjects in all. These comprise of Subjects:

Year I: ITP-11 to ITP14 and ITP-27, ITP-33, ITP-34

Year II: ITP-15 to ITP-21 and ITP-28

Year III: ITP-22 to ITP-26 and ITP-29, ITP-35

If any student wants to appear for semester system then follow the below mentioned subject's module:

Semester I: ITP11-ITP13, ITP33

Semester II: ITP14, ITP27 & ITP34

Semester III: ITP15-ITP18

Semester IV: ITP19-ITP21 & ITP28

Semester V: ITP22-ITP25

Semester VI: ITP26, ITP29 & ITP35.

Detailed Syllabus

YEAR I

ITP11---INTRODUCTION TO INFORMATION TECHNOLOGY
UNIT I Computing Fundamentals

Brief history of development of computers, Computer system, concepts, Computer system Characteristics, Capabilities and limitations, Types of computers Generations of computers, Personal Computer (PCs) – evolution of PCs, configurations of PCs- Pentium and Newer, PCs Specifications and main characteristics- Basic components of a computer system - Control unit, ALU, Input/output functions and characteristics, memory - RAM, ROM, EPROM, PROM and Other types of memory

UNIT II Input/output Devices and types of Printers

Input/output & Storage Units-: Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers& types - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers

UNIT III Software and its types, Operating System
Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs-DOS Windows, Linux, File Allocation Table (FAT & FAT 32), files & directory structure and its naming rules, booting process details of DOS and Windows,

UNIT IV Languages
DOS system files Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits

UNIT V Use of communication and IT
Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication; Modem - Working and characteristics, Types of network Connections - Dialup, Leased Lines, ISDN, DSL, RF, Broad band ,Types of Network - LAN, WAN, MAN ,Internet, VPN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN - Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways- Internet-Evolution, World Wide Web Internet Services, Convergence of technologies

UNIT VI MIS

Management information system - Introduction, Characteristics, Needs, Different views of MIS, Designing, Placement of MIS, Pitfalls in Designing an MIS, Computer based MIS – Advantages & Disadvantages

UNIT VII Computer Applications in Business
Need and Scope, Computer Applications in Project Management, Computer in Personnel Administration, Information System for Accounting-Cost and Budgetary Control, Marketing and Manufacturing, Computer Applications in Materials Management, Insurance and Stock-broking, Production planning and Control, Purchasing, Banking, Credit and Collection, Warehousing

UNIT VIII Ms Word
Introduction to Ms Word, Document Window, Application Window, Formatting in Ms Word, Mail Merge

Reference Books:
1. Fundamentals of Technology Project Management by Colleen Garton and Erika McCulloch
2. Fundamentals of Information Studies: Understanding Information and Its Environment, Second Edition by June Lester, Wallace C. and Jr. Koehler
3. The Basics of Information Security: Understanding the Fundamentals of InfoSec in Theory and Practice by Jason Andress

ITP12---Programming In C

Block 1: Introducing the Fundamentals of C Programming

Introduction, Exploring Data Types- The char Data Type, The int Data Type, The float Data Type, The double Data Type, The void Data Type. Introducing Constants, Introducing Variables- Declaring Variables, Initializing Variables. Introducing const and volatile Type Qualifiers- The const Type Qualifier, The volatile Type Qualifier. Explaining Data Type Modifiers, Exploring Backslash Constants, Exploring Symbolic Constant, Exploring Delimiters, Understanding Multiple Assignments.

Block 2: Managing Input and Output

Introduction, Input/output Functions, The printf() Function, The printf() Place holders- Type-identifiers, Type Prefixes, Field-width, Precision, Flags. Escape Sequence, The scanf() Function- Rules, Program. The scanf() place holders- Type Indicators, Use of *, Field-width. The getchar() Function, The gets() Function, The putchar() Function, The puts() Function.

Block 3: Working with Operators and Expressions in C

Introduction, Working with Operator- The Unary Operators, The Assignment Operators, The Arithmetic Operators, The Increment and Decrement Operators, The Relational Operators, The Logical Operators, The Bitwise Operators, The Conditional Operators, The Special Operators, The Shorthand Assignment Operators. Operator Precedence in C, Type

Casting in C, Implementing Mixed Mode Operation, Using Mathematical Functions in C, Using the Header Files and Preprocessor Directives.

Block 4: Control Structures-I

Introduction, Exploring the Syntax of a Control Structure, Working with Conditional Statements- Using the if Statement, Using the if-else Statement, Creating the Nested if Statements, Using the if-else Ladder, Using the switch Statement, Creating Nested switch Statements. Working with Iterative Statements- Using the while Loop, Using the do-while Loop, Using the Loop. Working with Jump Statements- Using the break Statement, Using the continue Statement, Using the go to Statement.

Block 5: Arrays

Introduction, Introducing Arrays, Types of Arrays- One-Dimensional Arrays, Two-Dimensional Arrays, and Limitations of Arrays.

Block 6: Working with Functions

Introduction, Overview of Functions- Function Definition, Function Invocation, Types of Functions- Built-in Functions, User-defined Functions, Parameter Passing Mechanisms, Passing Arrays in Function, Recursive Functions, Functions and Variables- Local and Global Variables, Static and Register Variables.

Block 7: String Handling in C-I

Introduction, Understanding Strings in C, Declaring and Initializing a String, Reading and Displaying the Strings- Using the scanf () and printf () Functions, Using the puts() and gets() Functions, Using the getchar() and putchar() Functions. Creating an Array of Strings.

Block 8: String Handling in C-II

Performing String Operations- Concatenating Strings, Calculating the Length of a String, and Comparing Strings- Using String Handling Functions- strlen(), strcmp(), strncmp(), strcat(), strncat(), strcpy(), strncpy(), strchr(), strlwr(), strupr(), strrev().

Block 9: Structures and Unions

Introduction, Structures- Defining a Structure, Declaring Structure Variables, Initializing Structure Variables, Nested Structures, Arrays of Structures, The type def Statement. Unions- Defining a Union, Declaring Union Variables, Initializing Union Variables.

Block 10: Pointers

Introduction, Understanding Pointers, Declaring a Pointer Variable, Using the address of (&) Operator, Initializing a Pointer Variable, Dereferencing a Pointer, Performing Operations on Pointers- Assignment, Arithmetic, Comparison, Working with Functions and Pointers- Call By Value, Call by Reference. Working with Arrays and Pointers- Pointers to One-dimensional Arrays, Pointers to String. Allocating Memory at Runtime- malloc(), calloc(), free(),realloc().

Block 11: Working with Preprocessor Directives

Introduction, Using the File Inclusion Directives, Using the Macro Substitution Directives- Defining a Simple Macro, Defining Macro with Arguments, Defining Nested Macros. Using the Compiler Control Directives- The #ifdef Directive, The #ifndef Directive, The #if Directive, The #ifelse Directive, The #ifelif Directive.

Block 12: Data File Processing in C

Introduction, Exploring Data Files, Opening and Closing Files- Reading from Files, Writing to Files, Accessing Data Files Randomly- The fseek() Function, The ftell() Function, The fread() Function, The fwrite() Function.

ITP13---RDBMS

Block 1: Understanding Database Management System

 Introduction to Databases- Data versus Information, File Oriented Approach, Database Oriented Approach, Characteristics of Database. Database Management System- Characteristics of DBMS, DBMS Architecture, Advantages and Disadvantages of DBMS, Types of Database Systems. Types of Database Models- Record-Based Model, Relational Model, Network Model, Hierarchical Model, E-R Model, Object-Oriented Model.

Block 2: Introducing Relational Database Management System

Introduction. Relational Database Management System- Characteristics of RDBMS, Exploring Tables in Databases, ER Diagrams. Explaining Data Integrity- Entity Integrity, Domain Integrity, Referential Integrity, User-Defined Integrity. Exploring Keys- Primary Key, Foreign Key, Composite key, Candidate Key. Rules of Normalization- First Normal Form, Second Normal Form, Third Normal Form, Fourth Normal Form, Fifth Normal Form. BoyceeCodd's 12 Rules

Block 3: Performing Basic SQL Operations

Introduction. Opening the Query Editor Window. Working with SQL Data Statements- Retrieving Data Using the SELECT Statement, Inserting Data Using the INSERT Statement, Modifying Data Using the UPDATE Statement, Deleting Data, Using the DELETE Statement. Working with Operators- Arithmetic Operators, Logical Operators, Comparison Operators, Assignment Operator, Bitwise Operators, String Concatenation Operators, Unary Operators, Compound Assignment Operator. Working with Aggregate Functions.

Block 4: Performing Transact-SQL Operations

Introduction. Data Types- Exact Numerics, Approximate Numerics, Date and Time, Character Strings, nicode Character Strings, Binary Strings, Other Data Types. Control Flow Statements- The BEGIN…END Statement, The GOTO Statement, The IF…ELSE Statement, The WHILE Statement. Database Operations- Creating a Database, Dropping the Database. Table Operations- Creating a Table, Altering the Table, runcating the Table, Dropping the Table. Constraints- The PRIMARY KEY Constraint, The UNIQUE Constraint, The FOREIGN KEY Constraint, The CHECK Constraint. Joins- Performing a Cross Join, Performing an Inner Join, Performing an Outer Join, Performing a Self-Join.

Block 5: Working with Stored Procedures and User-Defined Functions

Introduction. Benefits of Stored Procedures. Types of Stored Procedures- System Stored Procedures, User-Defined Stored Procedures. Creating a Stored Procedure. Altering a Stored Procedure. Using Parameters in a Stored Procedure-Using Input Parameters, Using Output Parameters. Types of User-defined Functions- Scalar Functions, Table-Valued Functions. Creating a User-Defined Function.

Block 6: Using Triggers

Introduction. Introducing Triggers. Triggers Vs Constraints. DML Triggers- Creating DML Triggers, Using DML Trigger. DDL Triggers- Creating DDL Triggers, Using DDL Triggers. DML Triggers Vs DDL Triggers.

Block 7: Understanding Transaction, Locking, and Error Handling

Introduction. Introducing ACID Properties. Classifying Transactions-Explaining Explicit Transactions, Defining Autocommit Transactions. Creating Transactions. Saving Transactions. Understanding Locking. Discussing Concurrency- Describing Optimistic Concurrency, Describing Pessimistic Concurrency, Discussing Concurrency Problems. Outlining Isolation Levels. Locking in SQL Server 2008 R2- Categorizing the Different Lock Modes, Managing Deadlock. Implementing Error Handling- Using the @@ERROR Function, Using the RAISERROR Statement, Using the TRY…CATCH Statement.

ITP14---operating system

Block 1: Overview of Operating Systems

Computer and System Software, Objectives and History of Operating Systems, Categories of OS, Job Scheduling, Virtual Storage.

Block 2: Memory Management

Device Management, Buffering, Spooling, Windows Operating Systems, Features of Windows OS, Linux OS, Features of Linux OS, Linux Distributions.

Block 3: Process Management and CPU Scheduling

Process Concept, Process Management, The Process Management Model, Creation and Termination of Processes, States of Process, Process Control Block, Process and Process Scheduling Algorithms, Process Behavior and CPU I/O Burst Cycle, First-Come-First-Served, Shortest-Job-First, Priority Scheduling, Pre-emptive Algorithms, Round-Robin, Multilevel Queues.

Block 4: Concurrency and Process Synchronization

Need for Concurrent Process Synchronization, Cooperating Processes, The Bounded Buffer Producers and Consumers Problem, Critical Section Problem, Inter- Process Communication, Semaphores, Monitors.

Block 5: Threads

Overview of Threads, User and Kernel Threads, Multithreading Models, Thread Libraries, Design Issues in Threads, Other Threading Issues

Block 6: Deadlock and Starvation

Overview of Deadlock Situation, Simple Resource Deadlock, River Crossing Problem, Conditions for Deadlock, Resource Allocation Graph.

Block 7: Deadlock Handling

Deadlock Prevention, Mutual Exclusion Condition, Hold and Wait Condition, No Preemption, Circular Wait, Deadlock Avoidance, Dijkstra's Banker's Algorithm, Deadlock Detection and Recovery.

Block 8: Main Memory and Virtual Memory Management

Storage Organization, Memory allocation to programs, Partitioning of Memory, Free Space Management, Buddy System Memory Allocator, Memory Protection Hardware in Multiprogramming Systems, Overlay Structured Programs, Paging, Page Replacement Algorithms, Segmentation

Block 9: File System Management and Implementation

File System Overview, File Access Methods, Structure of Directory, File Sharing, File Protection, File System Implementation, Directory Implementation

Block 10: Allocation Methods

File Allocation Methods, Free space management techniques, File System Recovery.

Block 11: Distributed System

Overview of Distributed Systems, Distributed Computing System Models, Design Issues of the DOS.

Block 12: Topologies

Network Topologies, Types of Computer Networks, Network Technologies, Communication Protocols, Fault Tolerance.

Block 13: Security

Security Goals, Security Mechanisms and Principles, Malicious Attacks, Mechanisms for Domain Protection.

Block 14: Authentication

User Authentication, Biometrics, Program Threats, Cryptography, Denial of Service Attacks.

Block 15: Introducing Linux

Introducing Linux, Exploring Linux Distributions, Exploring Fedora Linux, Exploring the Features of Fedora Linux, Deploying Fedora Linux

ITP27---Data Structure with C

UNIT I: Sorting and Searching Techniques

Bubble, Selection, Insertion, Shell sorts and Sequential, Binary, Indexed Sequential
Searches, Interpolation, Binary Search Tree Sort, Heap sort, Radix sort, Analysis of
Algorithms, Algorithm, Pseudo code for expressing algorithms, time complexity and space complexity,
Onotation, Omega notation and theta notation.

UNIT II: Hashing Techniques

Hash function, Address calculation techniques, Common hashing functions , Collision resolution , Linear probing, Quadratic, Double hashing, Bucket hashing, Deletion and rehashing .

UNIT III: Stacks

LIFO structure, creates, POP, PUSH.

UNIT IV: Queues

FIFO structure Priority Queues.

UNIT V: Linear List Concept.

UNIT VI: List v/s Array; Internal pointer & External pointer head, tail of a list, Null list, length of a list.

UNIT VII: Linked Lists: Nodes, Linked List Data Structure.

UNIT VIII: Linked Lists algorithms

Create List, Insert Node (empty list, beginning, Middle, end), Delete node(First, general case), Search list, Retrieve Node, add node, Remove node, Print List, Append Linked List, array of Linked; Complex Linked List structures: Header nodes, Circularly-Linked List, Doubly Linked List: Insertion, Deletion; Multilinked Lists: Insertion, Deletion.

UNIT IX: Introduction to Trees

Binary Trees: Travesals (breadth-first, depth-first); Expression Trees: (Infix, Prefix, Postfix Traversals); General Trees; Search Trees; Binary Search Trees .

UNIT X: Heap

Structure; Basic algorithms – ReheapUp, ReheapDown, Build heap, Insert, Delete .

UNIT XI: Multiway Trees

M-way search trees; B-Trees: Insertion (Inseet node, Search node, Split node, Insert entry), Deletion (Node delete, Delete entry, Delete mid, ReFlow, Balance, Combine), Traverse B-Tree; B-Tree Search.

UNIT XII: Graphs

Terminology; Operations (Add vertex, Delete Vertex, Add Edge, Delete Edge, Find Vertex); Traverse Graph (Depth-First, Breadth-First); Graph Storage Structures (Adjacency Matrix, Adjacency List); Networks: Minimum Spanning Tree, Shortest Path Algorithm, (Dijkstra's algorithm, Kruskal's algorithm, Prim's algorithm, Warshall's algorithm).

Reference Books
1**. Data structure** – **A Pseudocode Approach with C** – Richard F Gilberg Behrouz .
2. **Schaum's Outlines Data structure** Seymour Lipschutz Tata McGraw Hill 2nd

Edition .

3. **Data structures & Program Design** in C Robert Kruse, C.L.Tondo, Bruce Leung
Pearson .

4. "**Data structure using C**" AM Tanenbaum, Y Langsam & MJ Augustein, Prentice
Hall India.

ITP33---Practical-ITP12
ITP34---PRESENTATION/SEMINAR

YEAR II

ITP15---WEB TECHNOLOGY

Unit 1: Exploring Web Technologies

Exploring Web, Exploring Web Technologies, Describing Web Services, Exploring Web Applications, Exploring Web Architecture Models, Exploring the MVC Architecture

Unit 2: Exploring HTML

The Anatomy of an HTML Document, HTML Markups, Exploring Elements, Working with Absolute and Relative Links, Working with Ordered and Unordered Lists, Embedding Images, Controlling Appearance, Creating and Using Tables, Nesting and Targeting Frames.

Unit 3: Descriptive Markups

The META Element, Semantic Tags, the Dublin Core and RDF

Unit 4: Working with Style Sheets

Internal Style Sheet, Inline Style Sheet, External Style Sheet.

Unit 5: Client Side Programming

Introduction to the JavaScript Syntax, The JavaScript Object Model, Event Handling, Output in JavaScript, Forms Handling, Cookies.

Unit 6: Server Side Programming

Introduction to Server-Side Web Technologies, Programming Languages for Server-Side Scripting, Configuring Server to Support CGI Applications, Working with Forms and I/O Operations

Unit 7: Miscellaneous Web Technologies

Exploring Java Technologies, Describing VRML Idea, Microsoft .NET Technology

ITP16---unix with shell programming

Block 1: Introducing UNIX Operating System

Introduction, Hardware configuration for Unix, Features of Unix, Architecture of Unix, Unix Commands, PATH, man, echo, Printf, script, passwd, who, date, sty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip, Unix Utilities, System calls.

Block 2: Exploring File System in UNIX

Introduction, Utilities, File Handling utilities, Process Utilities, Disk Utilities, Text processing Utilities, Backup Utilities.

Block 3: File System Commands

File System Commands.

Block 4: Unlink

Du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin, Compressing and Decompressing files.

Block 5: Using advanced Commands in UNIX

Introduction, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm., cmp, diff, tr, awk, cpio.

Block 6: Using Vi Editor

Introduction, Modes, Command Mode, Insert Mode, Basic Navigation, Adding, Deleting and Changing text in vi editor, Saving and reading Files in vi editor.

Block 7: UNIX Shell Programming

Introduction, The Shell's Interpretive cycle, Describing types of Shells in Unix, C Shell, TC shell, Korn Shell, Bash Shell, Redirection, Pipes, Tee command, Shell Variables, Job Control.

Block 8: Quoting

Quoting, Quoting with Backlashes, Using Single Quotes, Using Double Quotes.

Block 9: Substitution

Substitution, File Substitution, Variable Substitution, Command Substitution, Arithmetic Substitution

Block 10: Exploring Filters

Introduction, Filter command, Concatenating File, Display Beginning and End of Files, Paginating File, Cut a File, Pasting Files, Sorting a File.

Block 11: Translating Characters

Translating Characters, Searching Duplicate Lines, Counting Characters, Comparing Files, Deleting Lines.

Block 12: Filtering with Awk

Introduction, Variables and Expressions, The comparison operators, Variables, Storing awk programs in a file.

Block 13: Arrays

Arrays, Functions, String Functions, Mathematical Functions, User-Defined Functions, Splitting Lines into Fields, Comparing sed and awk, Using grep.

Block 14: Programming in C shell

Introduction, Environment variables, Adding Environment variables, Setting Environment variables

Block 15: Using Scripts

Startup and Shutdown scripts, Command Execution scripts

Block 16: Expressions

Using Expressions, Commands Execution in Shell syntax

ITP17---COMMUNICATION SKILLS

UNIT I: Concord & Forms of Verbs Rule of Concord or Agreement.

UNIT II: Forms of Verbs: Present Tense, Past Tense, Future Tense, Tenses with Since.

UNIT III: The Future Tense in Adverbial Clauses, Tense in Sentences of Condition.

UNIT IV: Idiomatic use of Prepositions and Conjunctions.

UNIT V: What is an Idiom, Idiomatic Use of Prepositions.

UNIT VI: Words Followed by prepositions.

UNIT VII: Structural Use of Infinitive, Gerund and Participles.

UNIT VIII: The Participle, the Infinitive, Gerunds.

UNIT IX: Common Errors in English Adjectives and Adverbs (Confused).

UNIT X: Comprehension: Good Manners, The Conjurer's Revenge, The Home Coming,?
My Last Will and Testament.

UNIT XI: Vocabulary Building in English Language Useful Words for Expressing Ideas.
Derivations: Root Words.

UNIT XII: Prefixes and Suffixes, Antonyms and Synonyms,? Nationality Words: Names of
Countries and People.

Reference Books:-
1. Messages: The Communication Skills Book by Matthew McKay (Paperback - Mar
3, 2009).

2. People Skills: How to Assert Yourself, Listen to Others, and Resolve Conflicts by
Robert Bolton (Paperback - Jun 1986).
3. The Hard Truth About Soft Skills: Workplace Lessons Smart People Wish They'd
Learned Sooner by Peggy Klaus (Paperback - Jan 22, 2008).

ITP18---Basic mathematics

Block 1: Introduction to Sets

Objectives, Introduction, Types of Sets, Subsets, Equal Sets, Null Sets, Universal Sets, Finite and Infinite Sets, Open and Closed Sets Operations on Sets, Union of Sets, Intersection of Sets, Complement of Set, Partition of Sets, Cartesian Product of Sets, Cardinality of Sets, Venn-Diagrams, Applications of Sets.

Block 2: Relations and Functions

Objectives, Introduction, Basic Terminologies, Maximal and Minimal Points, Chains and Anti-chains Properties of Relation, Types of Relation, Equivalence Relation, Equivalence Relation with Partition, Partial Order Relations, The Pigeonhole Principle, Functions, Domain and Range, Types of Functions, onto Functions, into Functions, One-to-One Functions, Composite Functions, Inverse Functions, Algebraic Functions, Trigonometrical Functions, Logarithmic Functions, Exponential Function, Hyperbolic Functions, Zeroes of Functions.

Block 3: Introduction to Progressions

Objectives, Introduction, Arithmetic Progression, nth Term of an Arithmetic Progression, Sum of n Terms of an Arithmetic Progression, Arithmetic Mean, Applications of Arithmetic Progression, Geometric Progression, nth Term of a Geometric Progression Sum of n Terms of a Geometric Progression, Geometric Mean, Applications of Geometric Progression.

Block 4: Harmonic Progression

Harmonic Mean, Relation between Arithmetic Mean, Geometric Mean and Harmonic Mean.

Block 5: Determinants

Objectives, Introduction, Minors and Cofactors, Properties of Determinants, Rank of a Matrix, Inverse of a Matrix, CRAMER'S RULE

Block 6: Matrices

Types of Matrices, Operations on Matrices, Addition of Matrices, Subtraction of Matrices, Vector and Scalar Multiplication of Matrices, Inverse of a Matrix, Eigen Vectors of a Matrix, Caley-Hamilton Theorem.

Block 7: Differential Calculus

Objectives, Introduction, Derivative, Derivative of Sum, Derivative of Differences, Derivative of Products, Derivative of Quotients, Derivative of Logarithmic Function, Derivative of Composite Functions, Rolle's Theorem, Mean Value Theorem.

Block 8: Differential Calculus Series

Taylor's Series, Maclaurin's Series, Indeterminate Form, Leibnitz Theorem, Curve Tracing.

Block 9: Integral Calculus

Objectives, Introduction, Integral as Limit of Sum, Fundamental Theorem of Integral Calculus, Indefinite Integrals, Method of Integration, Substitution Method of Integration, By Parts Method of Integration, Partial Fraction Method of Integration, Integration of Algebraic and Transcendental Function, Gamma and Beta Function.

Block 10: Multiple Integration

Objectives, Introduction, Double and Triple Integration, Double and Triple Integration in Cartesian Coordinates, Double and Triple Integration in Cylindrical Polar Coordinates, Double and Triple Integration in Spherical Polar Coordinates, Applications of Double and Triple Coordinate, In Calculation of Area, In Calculation of Volume.

Block 11: Functions of Several Variables

Objective, Introduction, Limits and Continuity, Partial Differentiation, Chain Rule, Euler's Theorem, Maxima and Minima, Lagrange's Method of Undetermined Multipliers, Taylor's Formula.

Block 12: Plane Curves and Polar Coordinates

Objectives, Introduction, Polar Coordinates, Curve Tracing in Polar Coordinates, Arc Length, Area and Volume of Surface in Cartesian Coordinates, Area and Volume of Surface in Polar Coordinates.

Block 13: Correlation and Regression

Correlation, Types of Correlation, Karl Pearson's Coefficient of Correlation, Rank Correlation Method, Spearman's Rank Correlation Coefficient, Regression, Regression Lines, Application of Regression Lines for Forecasting Sales, Coefficient of Regression

Block 14: Probability and Probability Distribution

Introduction, Probability, Rules of Probability, Conditional Probability, Bayes Probability, Probability Distribution,
Random Variables, Binomial Distribution, Cumulative Binomial Probability, Poisson distribution, Normal Distribution

Block 15: Logarithms and Progression

Introduction, Logarithms, Laws Of Operations, Compound Interest, Arithmetic Progression, Geometric progression, Annuities.

Block 16: Statistics in Business

Introduction, Concept of Statistics, Importance of Statistics in Business Decisions , Presentation of Data, Measures of Central Tendency, Mean, Median, Mode, Measures of Dispersion, Quartile Deviation, Mean Deviation, Standard Deviation, Skewness, Measures of Skewness, Karl Pearson's Coefficient of Correlation, Kurtosis.

ITP19---PRINCIPLES OF MANAGEMENT

UNIT I: Conceptual Framework of Management Management Defined, Components of Management, Features of Management, Functions of Management, Nature of Management, Levels of Management, Administration and Management, Management as a Profession, Significance of Management from the Point of View of Modern Business Operations.

UNIT II : Evolution and Foundations of Management Theories Introduction, The Classical Organisation Theory, Neoclassical Approach or Theory, Facts Discovered through Hawthorne Experiments, Systems Approach to an Organisation, Modern Organisation Theory is Fundamental in Nature, Modern Organisational Theory: An Appraisal.

UNIT III: Management Planning Process Planning Process, Objectives and its Characteristics, Policy and its Meaning, Procedure Defined, Distinction between Policies and Procedures, Forecasting and its Various Aspects Organisation Meaning, Importance, Principles and Types Organisation: Meaning and Definition, Basic Elements/Steps/Features of an Organisation, Nature of an Organisation, Importance of an Organisation.

UNIT IV: Principles of an Organisation, Formal and Informal Organisation, Span of Control, Departmentation—Meaning, Types of Departmentation, Key Factors in Departmentation, Types of an Organisation Introduction, The Line Organisation, The Line and Staff Organisation, The Functional Organisation, The Project or Matrix Organisation, Distinction between Organisations, The Need for Committee Form of an Organisation, Understanding Organisation-structure and Designs Introduction, Organisation Defined, Consequences of Poor Organisation, AMA's Ten Commandments of Good Organisation, Principles of Objective, Process of Organising, Functions of Organisation, Organisational Design, Division of Labour or Principle of Specialisation.

UNIT V: Types of Authority Introduction, Sources of Authority, Decentralisation of Authority, Distinction Between Delegation and Decentralisation, Factors Determining the Extent of Decentralisation, Advantages of Decentralisation, Limitations of Decentralisation, The Technique of Decentralisation, Organisation Charts.

UNIT VI: Delegation of Authority Meaning of Delegation, Formal and Informal Delegation, Characteristics of Delegation, Limitations of Delegation, Process of Delegation, Merits of Delegation, Principles of Delegation, Weaknesses of Delegation.

UNITVII: Communication Communication Defined, Elements of Communication, Characteristics of a Good Communication, Objectives of Communication, Importance of Communication, Principles of Effective Communication, Obstacles/Barriers in Communication, Advantages and Disadvantages of Verbal and Written Communication, Measurement of the Success of Communication.

UNIT VIII: Motivation Defined, Importance of Motivation, Relationship of Motivation with Efficiency of the Working Force, Positive and Negative Motivation, Principles of Personnel Motivation, Human Needs, Maslow's Theory of Motivation, Ordinary Differential Equations and Applications.

UNIT IX: Staffing ,Staffing Defined ,Job Analysis ,Manpower Planning ,Recruitment ,Transfers and Promotions ,Appraisals ,Manpower Development ,Job Rotation ,Training ,Rewards and Recognition.

UNIT X: Co-ordination ,Definition of Co-ordination ,Characteristics of a Good Co-ordination ,Types of Co-ordination ,Need for Co-ordination ,Objectives of Co-ordination ,Principles of Co-ordination ,Steps to Achieve Co-ordination ,Techniques of Co-ordination ,Distinction between Co-ordination

and Cooperation ,Distinction between Vertical and Horizontal Co-ordination.

UNIT XI: Decision-making ,Decision-making Defined ,Characteristics of Decision-making ,Elements of Decision-making, ,Steps in Decision-making ,Principles of Decision-making ,Types of Decisions ,Importance of Decision-making ,Rational Decision-making ,Quantitative Techniques of Decisionmaking.

UNIT XII: Directing ,Directing Defined ,Elements of DirectionImportance of Direction ,Nature of Direction—Functions of Management ,Principles of Direction ,Principles of Issuing Orders ,Types of Direction ,Techniques of Direction.

Reference Books: -

1. **Total Quality Management in Education** by Sallis Edward (Associate Principal Brunel College of Technology Bristol) and Edward Sallis (Paperback - May 1, 2002)
2**. What Every Principal Should Know About Operational Leadership** (v. 6) by Jeffrey Glanz (Paperback - Nov 28, 2005)
3. **What Great Principals Do Differently: 15 Things That Matter Most** by Todd Whitaker (Paperback - Nov 2002)

ITP20---Operation Research

Block 1: Introducing UNIX Operating System

Introduction, Hardware configuration for Unix, Features of Unix, Architecture of Unix, Unix Commands, PATH, man, echo, Printf, script, passwd, who, date, sty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip, Unix Utilities, System calls.

Block 2: Exploring File System in UNIX

Introduction, Utilities, File Handling utilities, Process Utilities, Disk Utilities, Text processing Utilities, Backup Utilities.

Block 3: File System Commands

File System Commands.

Block 4: Unlink

Du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin, Compressing and Decompressing files.

Block 5: Using advanced Commands in Unix

Introduction, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm., cmp, diff, tr, awk, cpio.

Block 6: Using Vi Editor

Introduction, Modes, Command Mode, Insert Mode, Basic Navigation, Adding, Deleting and Changing text in vi editor, Saving and reading Files in vi editor.

Block 7: UNIX Shell Programming

Introduction, The Shell's Interpretive cycle, Describing types of Shells in Unix, C Shell, TC shell, Korn Shell, Bash Shell, Redirection, Pipes, Tee command, Shell Variables, Job Control.

Block 8: Quoting

Quoting, Quoting with Backlashes, Using Single Quotes, and Using Double Quotes.

Block 9: Substitution

Substitution, File Substitution, Variable Substitution, Command Substitution, Arithmetic Substitution

Block 10: Exploring Filters

Introduction, Filter command, Concatenating File, Display Beginning and End of Files, Paginating File, Cut a File, Pasting Files, Sorting a File.

Block 11: Translating Characters

Translating Characters, Searching Duplicate Lines, Counting Characters, Comparing Files, Deleting Lines

Block 12: Filtering with Awk

Introduction, Variables and Expressions, The comparison operators, Variables, Storing awk programs in a file.

Block 13: Arrays

Arrays, Functions, String Functions, Mathematical Functions, User-Defined Functions, Splitting Lines into Fields, Comparing sed and awk, Using grep.

Block 14: Programming in C shell

Introduction, Environment variables, Adding Environment variables, Setting Environment variables

Block 15: Using Scripts

Startup and Shutdown scripts, Command Execution scripts

Block 16: Expressions

Using Expressions, Commands Execution in Shell syntax

ITP21---Enterprise Resource Planning

Block 1: Introduction of Management Information System
Objectives, Introduction, Concept of Information System (IS), Components of IS, Trends in IS, Types of IS, Framework of IS in an Organization, IS and Business Process, Human Body as an Information System, IS Failures and Its Causes.

Block 2: Management Information System (MIS)

Nature and Scope of MIS, Characteristics of MIS, Functions of MIS, Structure of MIS, Physical Components, Information Processing, Management Activities at Various Levels, Decision Support System

Block 3: Strategic Role of MISH

Objectives, Introduction, Strategic MIS, Competitive Advantages with MIS, Customer Relationship Management (CRM), Supply Chain Management (SCM), Enterprise Resource Planning (ERP), Business Process Re-Engineering (BPR), Total Quality Management (TQM)

Block 4: Management of Data Resources

Objectives, Introduction, Concept of Data, Types of Data, Methods of Data Collection, Data Warehousing, Data Mining

Block 5: Designing Database

Hierarchical Data Model, Network Data Model, Relational Data Model, Resource Requirement and Procurement

Block 6: Decision Support Systems

Objectives, Introduction , Understanding DSS, Problem Solving and Decision Making, Simon's model of decision making, Types of Decisions, Components of Decision Support System

Block 7: Types of Decision Support Systems

Types of Decision Support Systems, Tools and Technologies used in DSS, DSS and Outsourcing.

Block 8: Introduction to ERP

Objectives, Introduction, Need for ERP Systems, Basic Concepts of ERP, ERP Model and Modules

Block 9: Implementation of ERP

Advantages and Disadvantages of ERP, Comparison between EMS and MIS

Block 10: ERP and E-Commerce

Introduction, Models of E-Commerce, Generations of E-Commerce, Some Basic Concepts of E-Commerce, E-Transaction, Certificate Issuance

Block 11: ERP and Applications of E-Commerce

ERP and Challenges of E-Commerce

Block 12: ERP and Related Technologies

Introduction, ERP Related Technologies, Online Analytical Processing, Data Mining

Block 13: Business Intelligence

Integration of ERP and Related Technologies

Block 14: Emerging Trends in ERP

Introduction, Emerging Technologies , ERP Deployment Models, Future of ERP.

Block 15: Ethical Aspects and Security of Information

Introduction, Ethics in Information Technology, Ethical Challenges of IT

Block 16: Security of Information

Security Management and Control, Requirement of Regulatory System, Security Policy, Legal Requirement.

ITP28---C# with .NET

Unit I

Introduction: What is C#, Why C#, Evolution of C#, Characteristics of C#, Applications of C#, How does C# differs from C++, How C #does differs from Java.

Overview of C# : Namespaces, Adding comments, Main returning a value, Using aliases for Namespace classes, Passing String objects to Write Line method, Command line arguments, Main with a Class, Providing interactive input, Using mathematical functions, multiple main methods, compile time errors, program structure, program coding style.

Literals, Variables & Data Types : Literals, variables, data types, value types, reference types, declaration of variables, initialization of variables, default values, constant variables, boxing & unboxing.

Operators and Expressions: Introduction; Arithmetic Operators; Relational Operators; Logical Operators; Assignment Operators; Increment and Decrement Operators; Conditional Operator; Bitwise Operators; Special Operators; Arithmetic Expressions; Evaluation of Expressions; Precedence of Arithmetic Operators; Type Conversions; Operator Precedence and Associativity; Mathematical Functions.

Decision Making and Branching: Introduction; Decision Making with if Statement; Simple if Statement; The if…else Statement; Nesting of if …..Else Statements; The else if Ladder; The Switch Statement; The? : Operator.

Decision Making and Looping: Introduction; The while Statement; The do Statement; the for Statement; the for each Statement; Jumps in Loops.

Unit II

Methods in C # : Introduction; Declaring Methods; The Main Method; Invoking Methods; Nesting of Methods; Method Parameters; Pass by Value; Pass by Reference; The Output Parameters; Variable Argument Lists; Methods Overloading.

Handling Arrays: Introduction; One-Dimensional Arrays; Creating an Array; Two-Dimensional Arrays; Variable-Size Arrays; the System. Array Class; Array List Class.

Manipulating Strings: Introduction; Creating Strings; String Methods; Inserting Strings Using System; Comparing Strings; Finding Substrings; Mutable Strings; Arrays of Strings; Regular Expressions.

Structures and Enumerations : Introduction; Structures; Structs with Methods; Nested Structs; Difference between Classes and Structs; Enumerations; Enumerator Initialization; Enumerator Base Types; Enumerator Type Conversion.

Unit III

Classes and Objects : Introduction; Basic Principles of OOP; Defining a Class; Adding Variables; Adding Methods; Member Access Modifiers; Creating Objects; Accessing Class Members; Constructors; Overloaded Constructors; Static Members; Static Constructors; Private Constructors; Copy Constructors; Destructors; Member Initialization; The this Reference; Nesting of Classes; Constant Members; Read-only Members; Properties; Indexers.

Inheritance and Polymorphism : Introduction; Classical Inheritance; Containment Inheritance; Defining a Subclass; Visibility Control; Defining Subclass Constructors; Multilevel Inheritance; Hierarchical Inheritance; Overriding Methods; Hiding Methods; Abstract Classes; Abstract Methods; Sealed Classes: Preventing Inheritance; Sealed Methods; Polymorphism.

INTERFACES:

Multiple Inheritances: introduction; Defining an Interface; Extending an Interface; Implementing Interfaces; Interfaces and Inheritance; Explicit Interface Implementation; Abstract Class and Interfaces.

Operator Overloading : Introduction; Overloadable Operators; Need for Operator Overloading; Defining Operator Overloading; Overloading Unary Operators; Overloading Binary Operators; Overloading Comparison Operators.

Managing Errors and Exceptions: Introduction; Types of Errors; Exceptions; Syntax of Exception Handling Code; Multiple Catch Statements; The Exception Hierarchy; General Catch Handler; Using finally Statement; Nested Try Blocks; Throwing Our Own Exceptions; Checked and Unchecked Exceptions; Using Exceptions For Debugging.

YEAR III

ITP22---COMPUTER NETWORKS

UNIT I: Data Communication and System
Introduction, Purpose, Source, Transmitter or Sender, Transmission System, Receiver Destination

UNIT II: Evolution of Communication
Technologies, Components, Data Transmission, Analog and Digital Data Transmission.

UNIT III: Data and Signal
Analog Signaling, Digital Signaling, Frequency Spectrum and Bandwidth.

UNIT IV: Time and Frequency
Domain Concepts, Space-division Multiplexing

UNIT V: Transmission Media,
Introduction, Magnetic Media, Twisted-pair Cables, Base band and Broadband Coaxial, Cables, Fiber Optics

UNIT VI: Computer Networks
LAN Applications and Benefits, Media Access Control, Centralized Control, Decentralized Control.

UNIT VII: Deterministic Access, Nondeterministic Media Access Control, LAN Hardware, Network Interface Card, LAN Operating systems, Transmission Media.

UNIT VIII: LAN Topologies, Bus Topology, Access Method and Collisions, LocalTalk, Ring Topology, Reliability Mechanisms, Star Topology, ATM for LANs

UNIT IX: Networking
Introduction, Networking, Benefits of Networks, Different LAN and WAN Connections, Local Area Networks (LANs), Wide Area Networks (WANs)

UNIT X: Connecting to a Network
Setting the Computer Network, Networking Technologies, Connecting your Network to the Internet, Testing Connection, Access Control And Denial Of Service, access Control Overview, Access Control Objectives, Identification and Authentication.

UNIT XI: Access Control Techniques, Passwords, Memory Card, Smart Card, Hand-held Password Generators, Biometrics, Encryption, Token, Encrypted Keys.Access Control Methodologies.

UNIT XII: Discretionary Access Control (DAC)
Mandatory Access Control (MAC), Role Based Access Control (RBAC), Access Control Implementation, Security Administration Cost Reductions

Reference Books:
1. Computer Networks (5th Edition) by Andrew S. Tanenbaum and David J. Wetherall
2. Computer Networks by Andrew S. Tanenbaum
3. Computer Networking: A Top-Down Approach (5th Edition) by James F. Kurose and Keith W. Ross

ITP23---Management information system

UNIT I: Systems Concepts, Components of Information, What is an Information System? A Framework for Business Users, Organization as a System, Management, Components of an Information System, Information System Resources, Why Information Systems?, The Competitive Business Environment, Why Business Need Information Technology?, Emergence of the Global Economy, Transformation of the Business Enterprise.

UNIT II: Types of Information Systems, National Level, Company Level, Individual Level Managers and

Information Systems, Role of Information Systems, The Network Revolution and the Internet, New Options for Organizational Design: The Networked Enterprise, Enterprise Resource Planning, Electronic Markets.

UNIT III: Tactical And Strategic Level Information Systems: Nature of Tactical and Strategic Information Systems, Tactical Accounting and Financial Information Systems, Cash Management Systems, Capital Budgeting Systems, Investment Management Systems, Strategic Accounting and Financial Information Systems, Financial Condition Analysis Systems, Long-range Forecasting Systems, Marketing Information Systems, Sales Management Systems, Advertising and Promotion Systems, Pricing Systems, Distribution Channel Systems, Competitive Tracking Systems, Strategic Marketing Information Systems, Sales Forecasting Systems, Marketing Research Systems, Product Planning and Development Systems, Tactical Production Information Systems, Materials Requirements Planning Systems, Just-In-Time Systems, Capacity Planning Systems, Production Scheduling Systems, Product Design and Development Systems, Manufacturing Resource Planning Systems, Computer Integrated Manufacturing Systems, Strategic Production Information Systems, Site Planning and Selection Systems, Technology Planning and Assessment Systems, Process Positioning Systems, Plant Design Systems, Tactical Human Resource Information Systems, Job Analysis and Design Systems, Recruiting Systems, Compensation and Benefits Systems, Succession Planning Systems, Strategic Human Resource Information Systems, Workforce Planning Systems, Information Systems Supporting Labour Negotiations.

UNIT IV: Systems Concepts, System Boundaries, Systems and Sub-systems, Outputs and Inputs, Interface Problems, System and its Environment, System Feedback, System Maintenance, System Stress and Change, Systems Concepts in Business, Information System as a Sub-system, Operational Systems, Outputs and Inputs, System Feedback, Sub-system Interface, Validation Checks, Structure of an Enterprise, Some Basic Concepts and Strategies in the Study of Systems, Classification of Information Systems, Classification by Mode of Data Processing, Classification by System Objectives, Classification based on the Nature of Interaction with Environment.

UNIT V: Components of Information Systems, Formal vs. Informal Specifications, Components of Specifications, Using the Systems Approach in Problem Solving, Define the Problem, Gather Data Describing the Problem, Identify Alternative Solutions, Evaluate the Alternatives, Select and Implement the Best Alternatives, Follow up to Determine whether the Solution is Working.

UNIT VI: Information Systems And Strategy: The Strategy Development Process, Process in Outline, Managing the Process, Information Systems and Business Strategy, Business Level Strategy and the Value Chain Model, Leveraging Technology in the Value Chain, Information System Products and Services, Systems to Focus on Market Niche, Supply Chain Management and Efficient Customer Response Systems, Firm Level Strategy and Information Technology, Industry Level Strategy and Information Systems: Competitive Forces and Network Economics, Information Partnerships, The Competitive Forces Model, Network Economics, Using Systems for Competitive Advantage: Management Issues, Managing Strategic Transitions, What Managers can do.

UNIT VII: What is an Organisation? Salient Features of Organisations, Why Organisations are so much Alike: Common Features, Why Organisations are so Different: Unique Features, Organisations and Environments, Other Differences among Organisations, Business Processes, How Organisations affect Information Systems.

UNIT VIII: Decisions about the Role of Information Systems, Information Technology Services, Why Organisations Build Information Systems, The Systems Development Process, How Information Systems affect Organisations, Economic Theories, and Behavioral Theories.

UNIT IX: Decision Support Systems (Dss), Decision Support Systems (DSS), DSS and MIS, Framework of Decisions Support Systems, Need for an Expanded Framework, An Expanded Framework, Types of DSS, Data-Driven SS Model-Driven DSS, Knowledge-Driven DSS, Document-Driven DSS, Communications-Driven and Group DSS, Inter-Organizational or Intra-Organizational DSS, Function-Specific or General Purpose DSS, Components of DSS Overview of a DSS, Examples of DSS Applications, Web-Based DSS, Customer Decision Support on the Internet.

UNIT X: Three Schools of Management, Technical-rational Perspective, Behavioural Perspective, Cognitive Perspective and Post-modern Era, Knowledge-based View of the Firm, Introduction to Decision Making, Levels of Decision Making, Types of Decisions: Structured versus Unstructured, Stages of Decision Making, The Decision Making Process.Individual Models of Decision Making, Rational Model.Psychological Types and Frames of Reference.

UNIT XI: Organizational Models of Decision Making, Bureaucratic Models, How Information Technology has Changed the Management Process Traditional and Contemporary Management, Implications for System Design.

UNIT XII: Integration in Business, Role of Enterprise Resource Planning (ERP), International Era, Financial Systems Logistics.Human Resource Systems, Integration, Customer Relationship Management, Multiple Contact Points Feedback Individual Needs and Cross Selling, Workgroup Integration, Announcements, Web Discussion and Surveys.

UNIT XIII: Document Libraries, Tracking Changes, Subscriptions, Approval Routing and Work Flow, Integrating with Legacy Systems Building a Data Warehouse, Limitations of Data Warehouse, The Internet: Integration of Different Systems, Applications and Concepts.

UNIT XIV: Transaction Processing Systems (TPS), Transaction Processing Systems, Meaning, Types of Transactions Characteristics of Transaction Processing Systems, Features of TPS, Process of Transaction Processing System, Processing and Revalidation.

UNIT XV: Artificial Intelligence, Artificial Intelligence, Artificial Intelligence Family, Why Business is Interested in Artificial Intelligence?, Capturing Knowledge: Expert Systems, How Expert Systems Work?, Building an Expert System, Problems with Expert Systems, Organizational Intelligence: Casebased Reasoning, Other Intelligent Techniques, Neural Networks, Difference between Neural Networks and Expert Systems, Fuzzy Logic, Genetic Algorithms, Hybrid AI Systems, Intelligent Agents.

UNIT XVI: Management Of Information Systems And Information Technology, Computers and Computer Processing, Mainframes, Mini Computers, Workstation Computers, Personal Computers, Super Computers, Computer Networks and Client/Server Computing, Client/Server Computing, Information Technology Trends, Interactive Multimedia, Smart Cards and Microminiaturization, Social Interfaces, Role of Information Technologies on the Emergence of New Organisational Forms, The Network Structure, Information Technology on the Emergence of Networks, Role of IOS within

the Network Structure, Changes in the Business Environment and their Effect on Organisational Design, IT and Organisational Design, IT-enabled Organisational Transformation, Four R's of Business Transformation, Five Levels of IT-induced Reconfiguration.

UNIT XVII: Managing Infrastructure And Enterprise Systems, Managing IT Infrastructure and Architecture: Enterprise Computing, Basic Concepts of Enterprise Computing, Industrial Networks and Trans-enterprise Systems, Business Drivers: The Changing Business Environment, Technology Drivers: The New Networked Environment, An Ideal Model of Enterprise Computing, Managing the New IT Infrastructure, Elements of the New IT Infrastructure, Key Infrastructure Decisions, Connecting Infrastructure to Strategy: Governance, Dealing with Mergers and Acquisitions, Enterprise Systems, The Vision, The Reality, Industrial Networks and Extended Enterprise Systems, The Vision, The Reality, Steps to Building and Managing ES and IN.

UNIT XVIII: Enterprise Resource Planning (ERP), Enterprise Resource Planning, What is ERP?, How an ERP Improve a Company's Business Performance?, How long will an ERP Project Take?, What will ERP Fix in my Business?, Will ERP Fit the Ways I do Business?, What does ERP Really Cost?, Why do ERP Projects Fail so often?, How do Companies Organize their ERP Projects?

UNIT XIX: Information Systems – Security And Control, System Vulnerability and Abuse, Threats to Computerized Information Systems, Concerns for System Builders and Users, System Quality Problems: Software and Data, Creating a Control Environment, General Controls, Application Controls, Security and the Internet, Developing a Control Structure: Costs and Benefits, Role of Auditing in the Control Process, Ensuring System Quality, Software Quality Assurance.

UNIT XX: challenges In Management Of Information Systems, Learning to Use Information Systems, Strategic Business Challenge, Globalisation Challenge, Information Architecture Challenge, Information Systems Investment Challenge, Responsibility and Control Challenge, Extranets Pack Tough New Challenges for MIS.

Reference Books:
1. **Management Information Systems** by Ken Laudon and Jane Laudon
2. **Management Information Systems** by James A. O'Brien and George M. Marakas

ITP24---SOFTWARE ENGINEERING

UNIT I: Introduction, The process, software products, emergence of software Engineering, evolving role of software

UNIT II: Software Characteristics and application
Software life cycle models, Software Characteristics, Applications, Software crisis

UNIT III: Software project
Software project management: Project management concepts, software process and project metrics Project planning, project size estimation metrics.

UNIT IV: Software Estimation

Project estimation Techniques, empirical estimation techniques, OCOMO- A Heuristic estimation techniques, staffing level estimation

UNIT V: Risk Analysis

Introduction team structures, staffing, risk analysis and management, project scheduling and tracking.

UNIT VI: Software Requirement

Requirements Analysis and specification requirements engineering, system modeling and simulation Analysis principles modeling, partitioning Software

UNIT VII: Software Prototyping

Prototyping methods and tools; Specification principles, Representation, the software Requirements specification and reviews

UNIT VIII: Software Analysis Modeling

Data Modeling, Functional modeling and information flow: Data flow diagrams, Behavioral Modeling

UNIT IX: Structured Analysis

The mechanics of structured analysis: Creating entity/ relationship diagram, data flow Model, control flow model, the control and process specification; the data dictionary; Other classical analysis methods

UNIT X: System Design

Design concepts and principles: the design process: Design and software quality, design principles; Design concepts: Abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure, software procedure, information hiding.

UNIT XI: Effective modular design

Functional independence, Cohesion, Coupling; Design Heuristics for effective Modularity; The design model; Design documentation

UNIT XII: Architectural Design

Software architecture, Data Design: Data modeling, data structures, databases and the data warehouse, analyzing alternative Architectural Designs, architectural complexity; Mapping requirements into software architecture; transform flow, Transaction flow; Transform mapping: Refining the architectural design.

Reference Books:
1. Software engineering by K.K. Aggarwal.
2. Software engineering: a practitioner's approach by Roger S. Pressman.

ITP25---INTRODUCTION TO MICROPROCESSOR

Unit I: Evolution of Microprocessor, Internal microprocessor (8086 to Pentium) architecture of 8086; Programming Model, Real mode memory addressing, Introduction to protected mode memory addressing memory paging. Addressing modes: Data, program, Stack, memory-addressing modes

Unit II: Instruction set of 8086, Assembly language programming for 8086 microprocessor, Memory Segmentation.

Unit III: 16 and 32 – bit memory interfacing, various bus protocols like ISA, EISA, VESA, PCI. Architecture Co-processor (8087), programming with 8087, Multi Processor System, Introduction to MMX technology

Unit IV: Introduction to Pentium and its higher generations: architecture, memory management. Assembler, debugger, Introduction to bit Slice processor, Signal processing processor and transputers, Introduction to development tools, MDS , logic analyzer , in-circuit emulator.

Reference Books:

1. **Uffenback, "The 8086 Family Design**" PHI, 2nd Edition.
2. **Lice & Gibson, "Microcomputer System 8086 / 8088**" PHI, 2nd Edition.
3. **H. P. Messmer, "Family Architecture Programing & Design: The Indispensible PC Hardware Book"** Addison Wesley, 1997.

ITP26---DESKTOP PUBLISHING

Unit I

CorelDraw Basics : Introduction; CorelDraw Terminology; Starting CorelDraw 10; CorelDraw Interface; Title Bar; Menu Bar; Tool Box; Drawing Window; Drawing Page; Property Bar; Flyouts; Standard Toolbar; Controlling the display of Toolbars; Working with Docker Windows; The Status Bar; CorelDraw View; Zooming and Planning.

Basic Drawing : Introduction; Working with Lines; Drawing a Curve; Bezier Lines and Curves; Rectangles and Squares; Ellipses and Circles; Polygons and Stars; Selection Techniques; Using Rulers; Using Grids and Guidelines; Defining Grids; Snap to Grid; Defining Guidelines; Snap to Guidelines; Spirals and Graphs; Spirals; Graphs

The Artistic Media Tool : Introduction; Using Preset Tool; Using Brush Tool; Using Object Sprayer Tool; Using Calligraphic Tool; Pressure-Sensitive Lines or Curves; Applying Artistic Media Effects.

Advanced Drawing : Introduction; Grouping and Ungrouping Objects; Working with Layers; Object Locking; Editing Curves with nodes; Editing Shapes and Nodes; Using Knife Tool; Using the Eraser Tool; Using Free Transform Tool.

Working with Text : Creating Artistic Text in Paragraphs; When to use Artistic Text?; Working with Artistic Text; Creating Artistic Text; When to use Paragraph Text?; Creating Paragraph Text; Switching between Artistic and Paragraph Text; The Text Property Bar; Formatting Text; Format Text Dialog Box; Character Formatting; Paragraph Formatting; Setting Tabs; Setting Columns; Using Effects; Using Edit Text Feature; Using Find and Replace; Change Case; Using Spell-Check; Grammar Checking Text; Using Thesaurus.

Advanced Text Work: Fitting Text to Path; Flowing Text around an Object; Flowing Text within an Object; Editing individual Characters; Kerning Individual Characters; Working with Text Styles; Linking Frames.

The Outline Tool : Introduction; Using the Outline Pen Dialog Box; Setting Outline; Outline Styles; Outline Color; Outline Corners; Setting Outline Arrows; Applying Calligraphic Outlines; Setting Outline Options with the Property Bar; Behind Fill Option; Scale with Image Option; Outline Color Dialog Tool; Color Model; Color Harmonies; Color Blend; Setting Outline Defaults.

The Fill Tool : Introduction; Using Uniform Fills; Using Fountain Fills; Using Texture Fills; Using PostScript Fills; Using Pattern Fills; Using Mesh Fills; Using Interactive Fills; Copying Fills; Setting Fill Defaults.

The Interactive Tools : Introduction; Distorting Objects; Push and Pull Distortion; Zipper Distortion; Twister Distortion; Extruding Objects; Blending Objects; Interactive Envelopes; Free Transformations; Applying Interactive Shadow; Applying Interactive Transparency; Applying Interactive Contours.

Unit II

Working with Images: Introduction; Image Formats; Importing Images; Using the Scrapbook; Bitmap Images; Cropping Bitmaps; Bitmap Special Effects; Color Masking; Resizing & Rotating/Skewing Images; Exporting Images.

Page Layout : Introduction; Layout Styles; Define Page Size; Setting the Size; Inserting Pages; Specifying Background Color; Hiding the Page Border; Going to specific Pages.

Printing and Publishing : Introduction; Selecting a Printer; Using Layout Styles when Printing; Tiling a Print Job; Using Print Style; Print to File.

Introduction to Photoshop: What is Photoshop?; New Features of Photoshop 2004 CS; Enhanced File Browser; Easily customize your keyboard shortcuts; Quickly create, view, and edit custom file information; Create slide shows and PDF presentations; Collaborate with Web photo galleries; Track your editing history; Easily access and use multiple filters; Use enhanced scripting; Customize the Help menu; How to Create Web Images; How to Customize and Automate; How to Fix and Enhance Photos; How to Paint and Draw; How to Prepare Art for Other Applications; How to Print Photos; How to work with Color; How to Work with Layers and Selections; How to Work with Type;

Tools of Photoshop

Using Tools; Marquees Tool; Lasso Tool; Cropping Tool; The Airbrush Tool; Clone Stamp Tool; Eraser Tools; Blur and Sharpen Tool; Path Component Selection Tool;

Pen Tool; Notes Tool; Hand Tool; Move Tool; Magic Wand Tool; Slice Tool; Paintbrush Tool; History Brush Tool; Paint Bucket Tool; Dodge Tool; Type Tool; Rectangular Tool;

Eyedropper Tool Zoom Tool; Healing Brush Tool;

Paints and Colors in Photoshop

Use of Paints; Color Tools; Color Picker; the Color Palette; the Swatches Palette;

Adding New Color; Saving Foreground as a Swatch; Blending Modes;

Normal; Dissolve; Multiply; Behind; Screen; Overlay; Hard light; Soft light; Darken; Color Dodge; Color Burn; Lighten; Exclusion; Difference; Hue; Saturation; Color; Luminosity; Smudges; Focus Tools; The Toning Tools; Dodge and Burn Tools; Sponge Tools; Different Media; Watercolor; Oil Painting; Pencil Filters; Chalk and Charcoal Filters; Working with Colors; RGB Model; CYMK Model; HSB Model; CIE Lab; Working Models; Bitmap and Grayscale Mode; Indexed Colors

Unit III

Text, Layers and Masks in Photoshop

Adding Text to Images; Layer Effect; Glows Effect; Bevel and Emboss; Using Layers and Masks; Layers; Creating a New Layer; Hiding and Showing of Layers; Working with Multiple Layers; Merging Layers; Layer Effects; Masks; Quick Mask; Adding Mask to the Layer; Editing Layer Masks; Removing Layer Mask

Special Effects in Photoshop

Applying a Radial Blur; Adding Noise Texture; Creating Halftone Pattern; Blending Modes; Applying Ripple Effect; Creating Lightening Effects

Menu Commands of Photoshop

Introduction; File Menu; Edit Menu; Image Menu; Layer Menu; Select Menu; Filter Menu; View Menu; Window Menu; Help Menu

Keyboard Shortcuts of Photoshop

Viewing; Selecting and Moving Objects; Painting; Editing; Path editing; Slicing and Optimizing

ITP29---JAVA PROGRAMMING

UNIT I: Fundamentals

Introduction, Basic Concepts of Object-oriented, Programming

UNIT II: Evolution of Java

Introduction, History of Java, Features of Java, How Java differs from C and C++, Java and Internet, Java and worldwide web, Web Browsers, Hardware and
Software, Requirements, Java Support Systems, Java Environment, Java Standard Library

UNIT III: Overview of java programming

Introduction, simple java program, application with two classes, java program structure
, tokens, statements, java virtual machine, command line argument

UNIT IV: Introduction to Constant, Variable

Constant, variable, data type, Introduction, Constant, Data Types in Java, Variable
Declaration, scoop of variable, Type Casting

UNIT V: Decision making branching a Looping

If statement, else statement, while statement, Do while statement, for statement,
Jumps in loops, Practicalelled Loops

UNIT VI: Class Object Method

What is a Class?, What are Methods?. Constructor, Method Overloading, Constructor Overloading
Instantiating Objects of a Class, Access Modifiers

UNIT VII: Inheritance

Introduction, Inheritance Basics, Member Access and Inheritance, Super Class Variable and Sub Class
Object

UNIT VIII: Array String Vector

Introduction, Array, One Dimensional Array, Two Dimensional Array, String, string Array.

UNIT IX: Interface

Introduction, Defining Interface, Extending Interface, Implementing Interface

UNIT X: Packages

What is a Package, Benefits of Package, Using System Package, Naming convention?
Creating Package, Class path variable

UNIT XI: Excepting Handling

Introduction, Type of Errors, Exception, Multi catch Statement Throwing our own
Exception

UNIT XII: Applet Programming

Introduction, Local and Remote Applet, Java Applications and Applets, Applet Life cycler
, Applet Tag.

Reference Books:

1. Head First Java, 2nd Edition by Kathy Sierra and Bert Bates.
2. Effective Java (2nd Edition) by Joshua Bloch

ITP35---PROJECT PROGRAM WORK

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