PT. SUNDARLAL SHARMA (OPEN) UNIVERSITY CHHATTISGARH

M.Sc. (COMPUTER SCIENCE)

SYLLABUS

Year- I

Course/Paper- I

Computer Fundamentals

Course Code- MSCCST1 **Credit-06**

UNIT-I Introduction: Introduction, What Does computer stand for? Strengths of computer, Limitations of computer, Fundamental use of computer, Development of computer, Types of computer, Generations of computer, Personal computer, Uses of Personal computer, Components of Personal computer, Evolution of PCs, Development of processors, Computer Organisation and Architecture, Input Unit, Central Processing Unit, Output Unit, What is Central Processing Unit?, Arithmetic & Logic Unit, Control Unit, Memory unit, Registers.

UNIT-II Input, Output and Storage Devices: Input Devices, Typing Input Devices, Pointing Input Devices, Scanning Input Devices, Audio Visual Input Devices, Output Devices, Monitor, Printers, Plotter, Electrostatic Technique, Special Purpose Output Equipment's, Storage Device and need, Brain Vs Memory, Types of Storage Devices , Data Access Methods, Primary Storage, Secondary storage, hard disc, Floppy disc, Winchester dick, Optical Disk, DVD, Zip Driver, Flash Drivers, Blue Ray Disk, Memory card.

UNIT-III Software and Programming Language: Software, Needs of Software, Types of Software, Operating System, The Booting Process, Types of Reboot, Types of Operating System, Data and Information, Quality of Information, Comparison between human language and computer language, Program, Programming Language, Programming Development Life Cycle, Program Flowcharts, Pseudocode, Programing Approaches, Types of Programming Languages, Third Generation Language, Fourth Generation Language, Virus, types of computer virus, anti-virus program.

UNIT-IV Information Technology, Computer network and Number system : Use of Communication and Information Technology, Communication process, Simplex , Half Duplex and full Duplex, Transmission Media, Serial and Parallel Communication, Computer Network, Types of Network, Networking devices, Virtual Private Network, Wifi, Topology, Internet, Number system, Decimal Number System, Binary Number System , Octal Number System, Hexa-Decimal Number System.

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SYLLABUS

Year- I

Course/Paper- II

Object Oriented Programming

Course Code- MSCCST2 **Credit-06**

UNIT-I Introduction: Procedure vs object oriented programming, basics concepts of oops, Benefits of oops, application of oops, program development environment, programming languages, c++ compilers, standard library, main() function prototype, data type, IDE, editing, compiling and running a program, C++ program structure, tokens, keywords, identifiers, constants, operators.

UNIT II Decision making, array and Function: Sequential statements, Mathematical functions, branching statements, looping statements, Arrays, one dimensional array, two dimensional array, function, user defined function, function call, function classification, passing parameter to function, recursion.

UNIT III-Classes and Objects: Classes, friend function, friend class, scope resolution operator, static class members, static data members, statics member function, passing object to a function, array of objects, pointers to objects, type checking, this pointer, pointer to class members, constructor, types of constructor, destructor, function overloading, operator overloading.

UNIT IV Inheritance, Polymorphism, Templates and Exception handling: Features of Inheritance, types of inheritance, base class and derived class, access control, protected members, ambiguity in single inheritance, granting access, virtual base class, Polymorphism, Types of polymorphism, virtual function and polymorphism, early vs late binding, class templates, function templates, exception handling, throwing and catching exception.

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SYLLABUS

Year- I

Course/Paper- III

Computer Network and Internet

Course Code- MSCCST3 **Credit-06**

Unit I: Computer Network Fundamentals: Computer network, LAN, WAN, MAN, network components, networking devices, client server network, domain name system, Network topology, Types of connectivity, Analog and Digital Signal, Modem, modem configuration, OSI and TCP/IP reference model.

Unit II: Physical and Data link layers: Physical layer services, Data and Signal, Digital and Analog Transmission, Transmission media, Multiplexing, switching technology, Data link layer services, Framing, Data link layer protocols: Stop and wait protocol, Sliding window protocol, HDLC, Media access protocols, Aloha, CSMA, ISDN, ATM, broadband.

Unit III: Upper Layers: Network layer services, Network layer protocols: Internet Protocol, ICMP, IGMP, IP address, Addressing scheme and subnetting, Transport layer services, Transport layer protocols: TCP, UDP, Application layer services, Application layer protocols: TELNET, DNS, SNMP, SMTP, FTP, HTTP, Firewalls.

Unit IV: E- Internet Services, world wide web and browsers: Internet, Internet service provider, Arpanet and www, Evolution of WWW, Net etiquette, application on internet, Remote login, electronic mail, search engine, serach and meta serach, web browsers, URL, web server.

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SYLLABUS

Year- I

Course/Paper- IV

System analysis and Design

Course Code- MSCCST4 **Credit-06**

UNIT-I Introduction: Concept of system, characteristics of system, elements of system, types of system, system development life cycle, steps in SDLC, system analyst, System analysis.

UNIT II System planning, information collection and analysis: System planning, strategic MIS planning, prototyping, identification of problem, fact finding techniques, Information collection techniques, Structured analysis, charts, data flow diagram, decision table, decision tree, feasibility study, steps in feasibility study, feasibility tests, data analysis, characteristics of costs and benefits, costs categories.

UNIT III System Design: Design Process, Methodologies of designing, structures design, functional decomposition, module coupling and cohesion, prototyping, information engineering, rapid application development, object oriented design, development activities, Input, output and form design, file organisation and database design, system testing and quality assurance, implementation and software maintenance.

UNIT IV System security and EDI: Supplier and types, Software industry, procedure for hardware/ software selection, system security, threats to system security, risk analysis, control measures, access control, audit control, system failures and recovery, Electronic data processing, types of data processing, DBMS, data warehouse, data verification, data validation, data centre.

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M.Sc. (COMPUTER SCIENCE)

SYLLABUS

Year- I

Course/Paper- V

Visual Basic

Course Code- MSCCST5

Credit-06

UNIT-I Introduction to Visual Basic: Visual Basic versions, Visual Basic characteristics, IDE, toolbar, menu bar, tool box, project explorer window, property window, form layout window, multiple forms, Object box, property list box, Object browser, code editor window, Development of a visual basic project, Forms, Characteristics of forms, functions on forms.

Unit –II Data types & Control Statements: Visual Basic data types, variable & constants, arrays, control flow statements, If…Then, If…Then…Else, select case, loop statement, Do loop, For…Next, While…wend, nested control structure, exit statement.

Unit –III Building Blocks of Visual Basic: Basic Active X Control, text box, list box, combo box, scroll bar, slider & file control, Advance Active X Control, Common dialog control, color, font, file open, file save, print, help, tree view & list view control.

UNIT-IV Components of Visual Basic: Graphics control, image handling, graphics methods, text drawing, lines & shapes, filling shapes, grid methods, menu editor, pull down & popup menus, multiple document interface, error handling, database programming with visual basic.

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M.Sc. (COMPUTER SCIENCE)

SYLLABUS

Year- II

Course/Paper- I

Advance Database Management System

Course Code- MSCCST6

Credit-06

UNIT-I Basic concepts, Database & Database Users: Characteristics of the Database approach, Advantages of using DBMS. Data Models, Schemas & Instances. DBMS Architecture & Data Independence. System Architecture for DBMS and Data Dictionary, Database Users Data Base languages & Interfaces. Data Modelling using the Entity-Relationship Model – Entity types, Entity Sets, Attributes and Keys, Relationship, Relationship Types, Week Entity Types, Structural Constraints, Enhanced ER Model- Specialization Generalization, Constraints on Specialization Generalization.

UNIT-II Relational Model, Languages & Systems: Relational Data Model Concepts and Constraints. Relational Algebra – select, project, set theoretic, join operations. Overview of Relational Calculus. SQL - A Relational Database Language. Data Definition commands, View and Queries, transaction commands, Specifying Constraints & Indexes in SQL.

UNIT-III Relational Data Base Design: Function Dependencies &Normalization for Relational Databases. Informal design guidelines for relation schemas, Functional Dependencies. Normal forms based on primary keys (INF, 2NF, 3NF& BCNF). Lossless join & Dependency preserving decomposition. Multivalued dependencies, join dependencies (4NF & 5NF), Denormalization.

UNIT-IV Advanced Transaction Processing: Basic concept; ACID properties; transaction state; implementation of atomicity and durability; Nested and Multilevel Transactions, Compensating Transactions and Saga, Long Duration Transactions, Weak Levels of Consistency, Transaction Work Flows, Transaction Processing Monitors.

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SYLLABUS

Year- II

Course/Paper- II

Operating System

Course Code- MSCCST7

Credit-06

UNIT-I Introduction to Operating System: Functions provided by operating system, operating system services, Introduction to multiprogramming, batch interactive Time sharing, and real time systems. Introduction to file systems, Access and allocation methods of file systems, Directory structure of a file system on a disk and tape, File protection.

UNIT-II Introduction to Scheduling, Memory Management and Deadlocks: CPU scheduling, various types of CPU Scheduling algorithms and their evaluation. Various types of memory management schemes like paging, Segmentation etc. Concept of virtual memory, Meaning of demand paging, various page replacement algorithms, System model.

UNIT-III Concurrency and Deadlock: Meaning of deadlocks, Resource allocation graphs, Deadlock Characterization, Various methods to avoid deadlocks like deadlock avoidance, Deadlock detection, Deadlock prevention, Banker's algorithm for deadlock avoidance. Introduction to concurrent processing, Precedence graphs, Critical section problem, Semaphore concept, Study of classical process co-ordination problem.

UNIT-IV Introduction to Unix O/s and Unix Commands: Architecture and Features of Unix O/S, History of Unix, flavors of Unix, Layered architecture of Unix O/S, Unix file system and its layout (Boot block, Super block, Inode Block, Data block), concept of Inode. **Unix Commands** – PATH, man, echo, who, date, cal, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, vi editor, pipe operator.

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SYLLABUS

Year- II

Course/Paper- III

Software Engineering

Course Code- MSCCST8 **Credit-06**

UNIT-I Introduction: The software and software engineering problem, approach and goals of software engineering. Software processes characteristics of a software process, software development process, project management process, software configuration management (SCM) process. Software development models: linear sequential (waterfall model), prototyping, rad, incremental, spiral, winwin spiral, concurrent development model.

UNIT-II Software requirement specification (SRS) and cost estimation: Need for SRS, component of SRS, Structure of a requirement document, Cost estimation, uncertainties in cost estimation, building cost estimation. Size estimation through delivered function point (DFP) and Source line of code of code (SLOC), Cost estimation model -COCOMO.

UNIT-III Software Management Renaissance: Conventional software management, evolution of software economics, improving software economics, the old way and the new way, life – cycle phases, artifacts of the process, model based software architecture, workflows of the process, checkpoints of the process.

UNIT-IV Software Management Discipline: Iterative process planning, project control and process instrumentation, tailoring the process, looking forward: modern project profiles, next generation software economics, and modern process transitions, testing in the transition phase.

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SYLLABUS

Year- II

Course/Paper- IV

Data mining and warehouse

Course Code- MSCCST9 **Credit-06**

UNIT -I Introduction: What is data mining?,Why it is important? , Mining on what kind of data, data mining functionalities, steps of data mining, knowledge discovery, Data mining techniques.

UNIT-II Data Warehouse: meaning, definition, Need for data warehousing, basic elements of data warehousing, OLTP vs OLAP, data warehouse architecture, three tier architecture, data cube and OLAP technology.

UNIT-III Classification and prediction: what is classification and prediction, decision tree algorithms, Bayesian classification, Rule based classification, classification by backpropagation, support vector machine, association classification, prediction using regression and neural network methods, accuracy measures and ensemble methods.

UNIT-IV Cluster Analysis and Data Mining Tools: What is cluster analysis, partitioning method, hierarchical method, k means clustering, Introduction to data mining tool, experiments with WEKA data mining tool for data pre-processing, feature selection, classification, prediction, clustering and association rule mining with experimental data of various domains.

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SYLLABUS

Year- II

Course/Paper- V

Artificial Intelligence and Expert System

Course Code- MSCCST10

Credit-06

UNIT -I Introduction: Overview of Artificial Intelligence(AI), foundations of AI, History of AI, Areas & state of art in AI, Knowledge, knowledge base system, knowledge representation techniques.

UNIT -II Problems and Heuristic Search Techniques: Problem solving as state space search, production system, control strategies & problem characteristics, search techniques: Breadth first, Depth first, hill climbing, Heuristic search, Best first search.

UNIT -III Knowledge Presentation and Programming Languages: Approaches and issues, frame, conceptual dependency, semantic net, scripts, propositional logic, first order propositional logic, conversion to clausal form, inference rules, resolution principal.

UNIT -IV Expert System and AI languages: Introduction, application, existing expert system, components of typical expert system, rule based system architecture, LISP, PROLOG.