

MCA Syllabi Book

MCA Syllabus With Teaching Scheme

For
Post Graduate Course of
Computer Applications

Master of Computer Applications
Faculty of Management and Information Science
Dharmsinh Desai University
Nadiad – 387 001, Gujarat, India.
<http://www.ddu.ac.in>

Master of Computer Applications (MCA) TEACHING SCHEME

SEMESTER I

Subject Code	Subject	Teaching Scheme		Exam Scheme					Credit Structure		
		Lec	Prac	Th	Sess	Prac /Viva	TW	Total	L	P	Total
CS 106	Computer Programming with 'C'	4	2	60	40	25	25	150	4	1	5
CS 103	Discrete Mathematical Structure.	4	-	60	40	--	25	125	4	0	4
CS 102	Logical Organization of Computer	4	2	60	40	25	25	150	4	1	5
CS 109	Linux Environment	4	2	60	40	25	25	150	4	1	5
CS 110	Financial Management & ERP	4	-	60	40	--	--	100	4	0	4
CS 118	Seminar	0	2	00	00	50	--	50	0	1	1
Total								725			24

SEMESTER II

Subject Code	Subject	Teaching Scheme			Exam Scheme				Total
		Lec	Tut	Prac	Th	Sess	Prac /Viva	TW	
CS 210	Data Structure using 'C'	4	0	2	60	40	25	25	150
CS 215	Database Management System.	4	0	2	60	40	25	25	150
CS 216	Computer Oriented Numerical & Statistical Methods	4	0	2	60	40	25	25	150
CS 212	Advance Programming Technique - I	4	0	2	60	40	25	25	150
CS 214	System Analysis & Design	4	0	2	60	40	25	25	150
CS 217	Seminar	0	0	2	00	00	50	--	50
Total									800

SEMESTER III

Subject Code	Subject	Teaching Scheme			Exam Scheme				Total
		Lec	Tut	Prac	Th	Sess	Prac /Viva	TW	
CS 317	Data Communication and Networking	4	0	2	60	40	25	25	150
CS 316	Electronic Commerce	4	0	2	60	40	25	25	150
CS 315	Software Engineering	4	0	2	60	40	25	25	150
CS 312	Core Java	4	0	2	60	40	25	25	150
CS 313	Introduction to Systems Programming	4	0	2	60	40	25	25	150
CS 318	Seminar	0	0	2	00	00	50	--	50
Total									800

SEMESTER IV

Subject Code	Subject	Teaching Scheme			Exam Scheme				Total
		Lec	Tut	Prac	Th	Sess	Prac /Viva	TW	
CS 408	Object Oriented System Development	4	0	2	60	40	25	25	150
CS 402	Operations Research	4	0	2	60	40	25	25	150
CS 415	Recent Trends in ICT	4	0	2	60	40	25	25	150
CS 405	Advance Programming Technique - II	4	0	2	60	40	25	25	150
CS 410	Advanced Database Management Systems	4	0	2	60	40	25	25	150
CS 416	Seminar	0	0	2	00	00	50	--	50
Total									800

SEMESTER V

Subject Code	Subject	Teaching Scheme			Exam Scheme				Total
		Lec	Tut	Prac	Th	Sess	Prac /Viva	TW	
CS 516	Mobile Application Development	4	0	2	60	40	25	25	150
CS 512	Advance Java	4	0	2	60	40	25	25	150
CS 508	Information System Management - Emerging Technique	4	0	2	60	40	25	25	150
CS 513	Software Testing	4	0	2	60	40	25	25	150
CS 518	Seminar	0	0	2	00	00	--	50	50
CS 504	Project	-	0	6	--	--	100	50	150
CS 517	Project-Seminar	-	0	-	--	--	50	--	50
Total									850

SEMESTER VI

Subject Code	Subject	Teaching Scheme			Exam Scheme				Total
		Lec	Tut	Prac	Th	Sess	Prac /Viva	TW	
CS 601	Project	-	-	24	--	--	300	100	400
CS 602	Project-Seminar	-	-	6	--	--	--	100	100
Total									500

Semester-I

Computer Programming with C (CS 106)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	Total
4	0	2	60	40	25	25	150

- [A] **Overview of C**
Why use C? Uses of C , A Brief history of C , C for personal computers
- [B] **Structure of a C program**
C's character set , The form of a C program , The layout of C programs, Pre-processor directives , Uses of functions (available in most used header files) , Comments in a C program
- [C] **Data Types – I**
Integer Number variables, Decimal Number variables, Character variables, Assignment statement, Arithmetic ordering, Variable declaration
- [D] **Input and Output**
printf function, sprintf function, The %Format specifiers, scanf function, Formatting the output
- [E] **Control Loops**
while, do while, Conditions, or logical expressions, The for loop
- [F] **Conditional Execution**
Program control – if, if..else, if..elseif..else, Using break and continue within loops, Select paths with Switch
- [G] **Complex structure and Nesting**
Using above mechanisms, generate programs with complex, looping mechanisms that supports nesting
- [H] **Functions and Prototypes**
Functions – C's building blocks, Functions and local variables, Getting the value of variables into functions, Function Prototype
- [I] **What is ANSI C?**
Standard Library functions, Data Types – II, Global variables, Constant data types
- [J] **Arrays**
Advantage of using an array, Declaration and use of D array, Declaration and use of multi-D array, sorting an array
- [K] **Pointers**
Point to Point, Swap shop, Pointers linked to arrays
- [L] **Strings**
Stringing along
- [M] **Structures**
Defining a new type, Structures and functions, Pointers to Structures, Memory management functions malloc, calloc & free, Structures and Linked Lists, Structures and C++, Header files
- [N] **File Handling**
Stream files, Text file functions, Binary file functions, File system functions, Command-line parameters

Text Books:

- 1 The C Programming Language ANSI C Version
By: Brian W. Kerninghan & Dennis Ritchie

Reference Books:

- 1 ANSI C – Made Easy
By: Herbert Schildt Osborne McGraw Hill
- 2 Let us C
By: Yashwant Kanetkar

Discrete Mathematical Structure (CS 103)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	-	60	40	--	25	125

A	Sets and propositions Combination, finite, uncountable infinite and infinite sets, mathematical induction, principles of inclusion and exclusion, propositions, tautology and contradiction
B	Permutations, combinations, discrete probabilities Rules of sums and products, permutations, combinations, generation, discrete probability, conditional probability
C	Relations and functions Relational model of databases, properties of binary relations, equivalence relation, partitions, partial ordering, lattices, chains and antichains, functions and pigeon-hole principle
D	Graphs Basic terminology, multi- and weighted graphs, paths, circuits, shortest path, Eulerian path, Traveling Salesman problem, factors of a graph, planar graphs, Operations on a graph, matrix representation of graph, graph traversal
E	Trees Trees, rooted trees, path length, prefix codes, binary search trees, spanning trees, minimum spanning trees, transport networks using Ford-fulkerson. Huffman's algorithm, Algorithm to find max spanning of a tree
F	Computability and Formal languages Russel's paradox and non-computability, ordered sets, languages, phrase- structured grammars, types of grammars and languages.
G	Recurrence relations Linear recurrence relations with constant coefficient, homogeneous, particular and total solutions, generating functions, matrix multiplication.
H	Group Groups and sub-groups, generators, evaluation of powers, cosets, Lagrange's theorem, permutation group and Burnside's theorem, group, codes, isomorphism, automorphism, homomorphism, normal subgroups, rings, integral domains and fields, ring homomorphism, polynomial rings
I	Lattices and Boolean algebras Lattices and algebraic systems, principle of duality, properties of algebraic systems, distributive lattices, uniqueness

Text Books:

- 1 Elements of Discrete Mathematics
C.L. Liu, 2nd Ed. McGraw-Hill
2. Discrete Mathematics
S. K. Chakraborty and B. K. Sarkar (Oxford University Press)

Reference Books:

- 1 Modern Applied Algebra
By: Birkoff and Bartee, McGraw-Hill, CBS.
- 2 Discrete Mathematics – A Unified Approach
By: Stephen A. Wiitala. Computer Science Series, McGraw-Hill

Logical Organization of Computer (CS 102)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	2	60	40	25	25	150

- [A] Representation of Information**
Generation of computers (overview), Analog and Digital computer, Block diagram of computer, Positive and negative numbers, Integers and reals, Number systems : binary, octal, decimal and hexadecimal, Binary addition, subtraction, multiplication and division, r's and (r-1)'s complement, Conversion from one system to another, Characters and codes ASCII, EBCDIC, UNICODE (introduction) ,Redundant coding for error detection and correction (Parity and Hamming code)
- [B] Basic Logic Design**
Basic Gates & its Truth tables, Boolean algebra ,Fundamental concepts of Boolean algebra,Basic theorem and properties of Boolean algebra, Boolean functions, Cannonical and standard forms, Sum of Product, Product of Sum, K-map method (upto 4 variables), Don't care conditions, Combination circuit design with AND, OR, NOT, NAND, NOR gates ,Exclusive-OR and Equivalence functions, Universal gates functionality
- [C] Arithmetic Logic Unit (ALU)**
Block diagram of ALU, Binary Half and Full adder, Decimal adder, Binary Parallel adder, BCD adder, Half and Full Subtractor
- [D] Combinational Circuit**
Encoder, Decoder, Multiplexer, Demultiplexer
- [E] Sequential logic**
Flip flops : RS, D, T, JK, Asynchronous, Synchronous and Master slave , Shift registers (shift left and shift right), Bidirectional shift register with parallel load , Counters: synchronous and ripple counter (BCD and Binary), Simple arithmetic and logic circuits
- [F] Memory Devices**
Memory hierarchy, Random access memory, Read only memory (construction of RAM and ROM is not included),Serial access memory (overview),Direct access memory, Cache memory and virtual memory (overview), Auxillary memory (overview)
- [G] CPU Architecture**
Introduction to 8085 Microprocessor,8085 hardware model, Programmable registers, Instruction format ,Addressing modes-direct, indirect, immediate, relative, indexed ,Addressing formats : Zero, single, double, register etc. ,Instruction set ,Instruction execution, Fetch and execution cycles , Micro-programming concept
- [H] I/O Architecture**
Peripheral devices, Properties of simple I/O devices and their controllers, Asynchronous data transfer, Handshaking, Data transfer modes, Programmed I/O, Interrupted I/O, DMA, Transfer of information between I/O devices, CPU and memory

Text Books :

- Digital Logic and Computer Design
By : M. Morris Mano, PHI
- Micrpprocessor Architecture, programming and applications with 8085
By : Ramesh S. Gaonker, Panram Int. Pub. (4th ed)

Reference Books:

- Computer System Architecture
By: M Morris Mano, PHI (3rd edition)
- Computer Organization and Architecture
By: William Stallings, 6th edition, PHI
- Structure Computer Organization
By: Andrew S Tanenbaum, 4th edition, Pearson Education

Linux Environment (CS 109)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	2	60	40	25	25	150

- [A] **Linux Contents and Applications**
Kernel Shell Relationship, Features of Linux, How does it differ from DOS
- [B] **Understanding the Linux Commands Locating commands**
Internal and External Commands
Arguments, Options and Filenames
Flexibility of command usage
- [C] **General Purpose Utilities**
banner, cal, date, who, tty, uname, passwd, echo, tput, bc, spell, ispell
- [D] **File System**
Parent Child Relationship, concept of PATH, pwd, home directory, Absolute pathnames, cd, mkdir, rmdir, ls, relative pathnames
- [E] **Handling Ordinary Files**
cat, ap, rm, mv, more, file, wc, od, split, cmp, □ty□., diff
- [F] **The Shell**
sh command, pattern matching- wildcard characters, escaping, quoting, redirection, /dev/null and /dev/tty two special files, pipes, tees, command substitution, shell variables
- [G] **vi editor**
- [H] **The Environment**
System variables, .profile, □ty, Aliases, set options
- [I] **Basic File Attributes**
Listing File Attributes, -d option, file permissions, chmod,
- [J] **Simple Filters**
pr, head, tail, cut, paste, uniq, nl, tr
- [K] **Regular Expressions and grep, egrep, fgrep family**
- [L] **Advanced Filters**
sort, awk, sed
- [M] **The process**
sh process, parents and children, ps, system process, internal and external commands, kill, nice
- [N] **The Shell programming Shell scripts**
read, command line arguments, exit status, logical operators, if, case, expr, sleep and wait, while, until, for, redirection
- [O] **System Administration**
Linux File systems, disks, Basic concepts of character devices and block devices mount command managing groups, adding users, removing users, changing user passwords, administrator's privileges, operation, managing disk space, find, dd, du, handling DOS diskettes, cpio, tar, partitions, inodes, data blocks, boot block, super blocks, how kernel access file, standard file systems fdisk, symbolic links
- [P] **Utilities**
cc, yacc, lex, make

Text Books:

1. UNIX- Concepts and applications,
By: Sumitabha Das TMH publication

Reference Books:

1. Using UNIX – Special Edition ,
PHI publication
2. Advanced UNIX- A Programmer's Guide,
By: Stephen Prata, BPB publication
3. The UNIX programming Environment,
By: Kernighan and Pike, PHI publication

Financial Management & ERP (CS 110)

SYLLABUS & SCHEME

[A]	Nature of Accounting & Analysis of Business Transactions: Definition, Objective & Scope, Concepts, Principals and Convictions in Accountancy, Advantages, disadvantages, Meaning of an Account, Classification of an Accounts, Rules of Debit and Credit.
[B]	Accounting Cycle Passing of entries in books of accounts – Trial Balance –Final Accounts – Current Assets – Current Liabilities – OtherLiabilities – Owner Equities – Trading Account – Record and Systems – Control Accounts and Subsidiary Ledgers –Limitations of Profit & Loss account & Balance sheet.
[C]	Interpreting Accounts and Financial Statement Use of Ratios in interpreting Financial Statements – Limitations – Other methods of Evaluation.
[D]	Introduction to ERP Evolution of ERP, What is ERP?, Reason for the growth of the ERP market, Advantages of ERP, Why do many ERP implementations fail?, Why are ERP packages being used now?
[E]	ERP models Finance sales and distribution, manufacturing human resources, Plant maintenance, Quality management, purchasing, marketing, production planning, Materials management
[F]	Benefits of ERP Reduction of lead time, On time shipment, Reduction in cycle time, Improved resource utilization, Better customer utilization, Improved supplier performance
[G]	ERP implementation life cycle Pre evaluation screening, Package evaluation, Project planning phase, Gap analysis, Reengineering Configuration, Implementation team training, Testing, Going live, End-user training, Post implementation
[H]	Extended ERP ERP & BPR

Text Books:

1. Financial Accounting & Management by Rana T. J., B.S. Shah Pub.
2. Financial Accounting by Khan & Jain
3. Advanced Accounts by Shukla M.C. & Grawal T.S., Chand Pub.
4. Advanced Accounts by R. L. Gupta (Sultan Chand Publication)
5. Enterprise Resource planning by Alexis Leon, Tata McGraw Hill

Reference Books:

1. Enterprise Systems for Management - Luvai F. Motiwalla, Jeff Thompson, (PHI)
2. ERP Demystified (Second Edition) - Alexis Leon, McGraw-Hill Education (India) Ltd., 2007.

Semester-II

Data Structure Using C (CS 210)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	Total
4	0	2	60	40	25	25	150

- [A] **Introduction to data structure**
Primitive & Non-primitive data structures, Operations on primitive data structure, algorithm analysis for time and space requirements. Storage management.(array representation, pointer overview)
- [B] **String manipulation**
Definitions and concepts, String manipulation and pattern matching, Primitive function, composite functions, strings manipulation in 'C' and its application
- [C] **Recursion**
Recursive definition, recursion in C, writing recursive programs, efficiency of recursion
- [D] **Stack and Queue**
Definition of stack, Application of stack, Representation of stack using array, implementing Operations on stack, Uses of stack (Postfix, infix, prefix examples using stack.), Definition of queue, Application of queue, Representation of queue using array, Circular queue
- [E] **Linked list**
Representation of single linked list using array and pointer, operations on singly linked list, Insertion as a first node, insertion as a last node, Insertion of a node at specific location, Deletion of first node, deletion of last node, deletion of a desired node, Searching for the particular element, Sorting the linked list, Reversing the list, Traversing a linked list. B. Doubly linked list, Representation of doubly linked list, Operations of doubly linked list, Insertion as a first node, insertion as a last node, Insertion of a node at specific location., Deletion of first node, deletion of last node, deletion of a desired node,, Searching for the particular element, Sorting the linked list, Traversing a linked list. C. Circular linked list, Representation of circular linked list, Inserting and deleting a node in it.
- [F] **Non-linear data structures.**
Definition of tree, Representation of tree, Types of tree, Binary tree traversal, Storage representation and manipulation of binary tree, Conversion of general tree to a binary tree, Other representation of tree, application to tree.,, Representation of graphs, Graph traversal and spanning forest. Finding the shortest path (Warshall's Algorithm, Warshall's modified algorithm, Dijkstra's Technique), Graph traversal (depth first search, breadth first,search)
- [G] **Sorting and searching methods.**
Linear search, Binary search, Sorting methods, Internal and external sorting, Bubble sort, Quick sort, Merge sort, Partition exchange sort,. Shell sort,. Insertion sort,. Selection sort, Radix sort, Address calculation sort, Heap sort.

Text Books:

1. An introduction to data structures with their applications
By: Trembley and Sorenson
2. Expert data structures with C By: R. B. Patel

ReferenceBooks:

1. Data structures using C and C++ - Y. Langsam, M. J. Augenstein, A. M.Tenenbaum

Database Management System (CS 215)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	2	60	40	25	25	150

A	Introduction to Database Management System Database System Applications, Database Systems versus File Systems, View of Data, Data Models, Database Languages, Database Users and Administrators, Transaction Management, Database System Structure, Application Architectures, History of Database Systems
B	Entity Relationship Model Basic Concepts, Constraints, Keys, Design Issues, Entity Relationship Diagram, Weak Entity Sets, Extended ER Features, Design of an ER Database Schema, Reduction of an ER Schema to Tables
C	Relational Model and Basic Structure of SQL Structure of Relational Databases, The Relational Algebra, Extended Relational Algebra Operations, Modification of the Database, Views, Basic Structure of Structured Query Language, the select clause, the where clause, the from clause, (The above clauses has to be taught so that an equivalent SQL statement for a relational algebra can be developed)
D	Integrity and Security Domain Constraints, Referential Integrity
E	Relational Database Design First Normal Form, Pitfalls in Relational Database Design, Functional Dependencies, Decomposition, Desirable Properties of Decomposition, Boyce Codd Normal Form, Third Normal Form, Fourth Normal, More Normal Forms, Overall Database Design Process
F	Storage and File Structure Overview of Physical Storage Media, RAID, Storage Access, File Organization, Organization of Records in Files, Data Dictionary Storage
G	Indexing and Hashing Basic Concepts, Ordered Indices, B+ Tree Index Files, BTree Index Files, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Multiple Key Access
H	Transactions Transaction Concept, Transaction State, Need for concurrent executions, Serializability concept
I	Concurrency Control Idea about locking using lock based protocol and time stamp based protocol, Deadlock Handling, Insert and Delete Operations
J	Recovery System Failure Classification, Storage Structure, Recovery and Atomicity, Log Based Recovery, Shadow Paging
K	Database System Architectures Centralized and Client Server Architectures, Server System Architectures, Parallel Systems, Distributed Systems, Network Types

Text Books:

- 1 Database System Concepts (4th Edition),
By: Abraham Silberschatz, Henry F.Korth and S.Sudarshan
McGraw Hill Publication

Computer Oriented Numerical & Statistical Methods (CS 216)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	2	60	40	25	25	150

- [A] **Statistical Methods (65%)**
Scope of statistics, Collection of data
- [B] **Frequency Distribution (F.D.)**
- [C] **Graphical presentation of F.D.,**
- [D] **Measure of central tendency**
- [E] **Measure of Dispersion, Skewed curves,**
- [F] **Coefficient of variations & Coefficient of skewness.**
- [G] **Definition of probability, Sample space & events**
- [H] **Theoretical Distributions**
Binomial, Multinomial, Poisson, Normal
- [I] **Statistical Inference**
Random sampling, Test of hypothesis (except testing the significance of an observed correlation coefficient).
- [J] **Test & goodness of fit, F-Test.**
(Except Yate's correlation)
- [K] **ANOVA (Analysis Of Variance)**
- [L] **Time series Analysis.**
- [M] **Numerical Methods (35%)**
Iterative methods, Bisection, False-Position, Newton-Raphson methods, Euler's Methods, Runge-Kutta Methods
- [N] **Interpolation**
Polynomial interpolation, difference tables, Newton forward and backward Interpolation formula, Lagranges formula, Newton's Divided Difference Formula
- [O] **Numerical Integration**
Trapezoidal rule, Simpson's Rules
- [P] **To solve simultaneous linear equations**
Gauss Elimination Method

Text Books:

- Numerical Methods
By S. S. Sastry
- Statistical Methods
By S. P. Gupta

Reference Books:

- Quantitative Analysis for Business Decisions
By Bobby Srinivasan & C.L. Sandblom, Mc Graw Hill, 1st ed

Advanced Programming Technique - I (CS 212)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	Total
4	0	2	60	40	25	25	150

- [A] **Object-oriented programming Concepts and beginning with C++**
- [B] **Tokens, expressions and control structures**
- [C] **Functions in C++**
- [D] **Classes and objects**
- [E] **Constructors and destructors**
- [F] **Operator Overloading**
- [G] **Type Conversion**
Basic to class conversion, Class to basic conversion, Class to class conversion,
- [H] **Inheritance**
Definition and types of inheritance, Single, Multiple, Multilevel, Hierarchical, Hybrid Inheritance, Virtual base class, Constructors in derived class, Nesting of classes
- [I] **Pointers and virtual functions**
Pointer to objects, this pointer, Pointer to data members and member functions, Virtual function and pure virtual function
- [J] **Polymorphism**
Definition and types of polymorphism, Compile-time polymorphism, Runtime polymorphism, Abstract base class,
- [K] **Managing console I/O operations**
C++ Streams, C++ Stream classes, Unformatted I/O operations, Formatted Console I/O operations, Manipulators
- [L] **Working with files**
Classes for File Stream operations, open() function, file opening modes, File-pointer manipulation, Sequential and Random file access, Handling exceptions,

Text Books:

“Object Oriented Programming with C++” by E. Balagurusamy, McGraw Hill

Reference Books:

“Turbo C++” by Robert Lafore, PHI Publications

System Analysis and Design (CS 214)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	2	60	40	25	25	150

- [A] System Analysis & Design**
Information System, Functions and Uses in the Organization, Users of Information Systems, Categories
- [B] Transaction Processing System and its procession mode**
viz Batch, Online, and Real, Management Information System, Decision Support System, Needs and Impacts of Computers in the Organization, Manual and Computerized Information System
- [C] Problems with Computerization, Disadvantages of Computers in Application, System Analysts Responsibilities and Personal Characteristic required**
- [D] System Development Life Cycle Method**
System Analysis, Design and Implementation, Phases Inception, Reason for Project Request, Source of Project Request, Preliminary Study, Request Clarification
- [E] Feasibility Study**
Technical, Operational and Financial feasibility, Request Approval, Project Selection Requirement and Methods Steering Committee, Information System Group etc. Scope, Boundary and Objective of the project undertaken, Analysis using Fact Finding Techniques
Interviews, Observation, Questionnaire, Record Review.
- [F] Decision Analysis**
Structured English, Decision Tables, Methods of performing Cost Benefit Analysis, System Design Logical and Physical Design, Selection of Hardware and Software, Criteria to Evaluate Hardware and Software
- [G] Structured Analysis Development Method**
Data Flow Analysis, Developing Logical model of the system using Data Flow Diagram, Data Dictionary, HIPO Chart, Visual Table of Content, System Flow Chart, Data Structure Diagram, Entity Relationship Diagram
- [H] Logical Design of the System**
Analysis to Design Transition, Analysis of Facts, Elements of Design, Design of Inputs, Outputs, Files, Procedures, Controls, Program Specifications, Interfacing Methods, Menus, Online Dialogues, Managing the Design Process, Managing End-User Developed System
- [I] Documentations :**
System, Design, Operational, User, Time Chart, Budget Chart
- [J] System Installation**
Planning, Equipment Installation, Program Developments, Design and Documentation of Software, Program and System Testing, Errors, File Conversions, User Training, Performance Evaluation of the System, Quality Assurance, Post-Implementation Review
- [K] Prototype Methodology :**
Steps to Follow, Packages : Characteristics and Requirements, Categories of Packages, Criteria to evaluate Packages, Fourth Generation Languages and its tools, End-User Developed System.
- [L] Introduction to Software project management**
- [M] MIS (Management Information System).**
Introduction. Importance of MIS - computer & MIS - Organization Structure & MIS future of MIS., MIS: the factor of success and failure.

[N] Information system and organization.

Introduction. Data & Information.- Management & Decision making. Information support for functional areas of management. Impact of business on information system - organizing information system. MIS and information concept.

[O] Classification of MIS

DSS. TPS. OAS. ESS. ES EIS

Text Book

1. Analysis, Design and Implementation of an Information System,
By Henry Lucas, McGraw Hill
2. Analysis and Design of an Information System,
By James Senn, McGraw Hill
3. Management Information Systems A Managerial Perspective
By Uma Gupta (Galgotia Publications Pvt Ltd)

Reference Books:

1. Information System Concept for Management
By, H. Lucas, McGraw Hill (1987)
2. System Analysis and Project Management
By, Cleland and King, McGraw Hill (1983)

Semester-III

Data Communication and Networking (CS 317)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	2	60	40	25	25	150

- [A] **Introduction**
Data communications, networks, Internet, protocols and, Standards, Layered tasks, the Internet model, the OSI model
- [B] **The Physical layer**
Analog and Digital Data, Analog and Digital signals, concept of Bandwidth for analog, digital and composite signals, analog versus Digital, Data rate limits, transmission impairments, throughput, Propagation speed, propagation time and wavelength of signal.
Concept and need of coding, overview of line coding and block Coding, concept of sampling, PAM, PCM, Nyquist theorem, bit Rate
Transmission mode: parallel, serial, synchronous and Asynchronous, bit rate and baud rate, need for modulation of a signal, AM, FM, PM (overview only)
RS-232 standard for serial communications, working of a modem, Modem types: internal and external, prevalent standards like V.92 for modems. Working of a multiplexer, demultiplexer, FDM, TDM, WDM
Transmission Media: guided and unguided, circuit switching and Telephone Networks, different switches based upon Space Division, Frequency division, time division, LATA.
- [C] **The Data Link Layer**
Error Detection and Correction, Flow and Error control, Stop And wait ARQ, Go Back N ARQ, Selective Repeat ARQ, HDLC, PPP protocol, PPP stack, HDLC, Multiple Access protocols: Random Access, Controlled Access, and Channelization.
Local Area Networks and Ethernet standard, Traditional Ethernet, Fast Ethernet, Gigabit Ethernet.
Network Interface Devices: repeaters, Hubs, Bridges, switches, backbone networks, virtual LANs.
- [D] **The Networking Layer**
Internet works, Addressing, Routing.
Network layer protocols: ARP, RARP, IP, and ICMP
The Ipv6 addressing format, Unicast routing and Unicast routing protocols, multicast routing and MBONE.
- [E] **The Transport Layer**
Process-to-Process delivery, UDP, and TCP. Concepts of congestion control: data traffic, congestion, and congestion control, congestion Control in TCP.
- [F] **The Application Layer**
The Client server model and concept of socket, socket interface, DNS: Name space, domain name space, distribution of name space, DNS in the Internet, Resolution and DNS messages
DHCP, SMTP and FTP, HTTP, WWW 2

Text Books:

1. Data communication and networking
By: Behrouz Fourozan
(TMH publications)

Reference Books:

1. TCP/IP Protocol Suite
By: Behrouz Fourozan
(TMH publications)
2. Communication Networks
By: Alberto Leon-Garcia, Indra Widjaja
3. Computer Networks
By: Andrew S. Tanenbaum

Electronic Commerce (CS 316)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	2	60	40	25	25	150

- [A] **Introduction to Electronic Commerce**
What is Electronic Commerce?, Benefits of Electronic Commerce, Impact of Electronic Commerce, Classification of Electronic Commerce, Applications of Electronic Commerce Technologies
- [B] **Electronic Commerce: Business Models**
What is a Business Model?
- [C] **Electronic Data Interchange**
Conventional Trading Process, What is EDI?, Building blocks of EDI systems: Layered Architecture, Valued Added Networks, /benefits of EDI, Applications of EDI
- [D] **Electronic Commerce: Architectural Framework**
Framework of Electronic Commerce
- [E] **Electronic Commerce: Information Publishing Technology**
Information Publishing, Web Browsers, Hypertext Markup Language, Common Gateway Interface, Multimedia Content, Other Multimedia Objects, Virtual Reality Modeling Language (VRML)
- [F] **Electronic Commerce: Securing the business on Internet**
Why information on Internet is Vulerable?, Security Policy, Procedures and Practices, Site Security, Protecting the network, Firewalls, Securing the web (HTTP) servies
- [G] **Electronic Commerce: Securing Network Transaction**
Transaction Security, Cryptology, Cryptographic Algorithms, Authentication Protocols, Security Protocols of Web Commerce
- [H] **Security Introduction**
Security goals, Attacks, Service and mechanism, Techniques,
- [I] **Traditional Symmetric-Key Ciphers**
Introduction , Substitutional Ciphers, Transpositional Ciphers, Stream and Block Ciphers
- [J] **Asymmetric -Key Cryptography**
Introduction, Transpositional ciphers, RSA cryptosystem, Rabin Cryptosystem
- [K] **Message integrity and message authentication**
Message Integrity, Random Oracle Model, Message authentication, Hash functions
- [L] **Digital Signature**
Comparison, Processes, Services, Attacks on Digital Signature, Digital Signature Schemes,
- [M] **Key Management**
Symmetric-key distribution, Kerberos, Symmetric-key agreement, Public-key Distribution,
- [N] **Electronic Payment Systems**
Introduction to Payment Systems, Online Payment Systems, Pre-Paid Electronic Payment Systems, Post-Paid Electronic Payment Systems, Requirements metric of Payment Systems
- [O] **Mobile Commerce: Introduction, Framework and Models**
What is mobile commerce?, Benefits of mobile commerce, Impediments of mobile commerce, Mobile commerce Framework

Text Books:

1. Electronic Commerce Framework, technologies and applications
By: Bharat Bhasker (2nd edition)
Tatamcgraw hill
2. Cryptography & Network security
By: Behrouz A. Fourouzan (Special Indian edition)
Tatamcgraw hill

Reference Books:

1. Electronic Commerce Security, Risk management and control
By: Greenstein Feinman (fourth reprint)
Tatamcgraw hill

Software Engineering (CS 315)

SYLLABUS & SCHEME

TEACHING SCHEME						EXAM SCHEME (Marks)	
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	Total
4	0	2	60	40	25	25	150

- [A] **Introduction**
Its evolution, Software development projects, Emergence of software engineering, notable changes in software development practices, computer systems engineering
- [B] **Software Life Cycle models**
Life cycle model, Waterfall model, Iterative model, Prototyping Model, Evolutionary Model, Spiral model, Comparison of different life cycle models
- [C] **Software Project Management**
Responsibilities of a software project manager, Project planning, Metrics or project size estimation, Project estimation techniques, Empirical estimation techniques, COCOMO model, An analytical technique, Staffing level estimation, Scheduling, Organization and team Structures, Staffing, Risk management, Software configuration management.
- [D] **Requirements Analysis and Specification**
Requirements gathering and analysis, Software Requirements Specification, Formal system specification, Axiomatic specification, Algebraic specification.
- [E] **Software Design**
Outcome of a design process, Cohesion and coupling, Layered arrangement of modules, Approaches to software design.
- [F] **Function-oriented software design**
Overview of SA/SD methodology, Structured Analysis, DFDs, Structured design, Detail design, Design review
- [G] **User Interface Design**
Characteristics of a good user interface, Basic concepts, Types of user Interfaces, Fundamentals of component-based GUI development, User interface design methodology
- [H] **Coding and testing**
Coding, Code review, Software documentation, Testing, Unit testing, Debugging, Program Analysis Tools, Integration testing.
- [I] **Software Reliability and Quality Management**
Software Reliability, Statistical testing, Software Quality, Software Quality Management System, ISO 9000, SEI capability maturity model, Personal software process, Six sigma
- [J] **Software Maintenance**
Characteristics of software maintenance, Software reverse engineering, Software maintenance process models, Estimation of maintenance cost
- [K] **Software Reuse**
Introduction, Basic issues in any reuse program, A reuse approach, Reuse at organization level.

Text Books :

1. Software Engineering A practitioner's Approach. 6th edition –Roger Pressman. (Mcgraw-hill international edition)
2. Fundamentals of Software Engineering- Rajib Mall (PHI) third edition

Reference Books:

1. Software Engineering by Ian Sommerville, Fifth edition, Addison Wesley.

Core Java (CS 312)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	2	60	40	25	25	150

- [A] **An introduction to Java**
Brief History of Java, Salient features of Java
- [B] **Java Programming Environment**
Java Development Kit, Using Command-line tools, Building and running applets
- [C] **Fundamental Programming structures in Java**
Data types, Variables and Constants, Operators, Strings & String Buffer, Input & Output, Control Flow, Arrays, Conversions
- [D] **Objects and Classes**
Objects, Defining your own classes, Static Fields & methods, Object Constructions, Packages, Documentation Comments
- [E] **Inheritance**
Classes, Super Classes & Subclasses, Object - The Universal Superclass, Object Wrappers, Reflection, Enumeration Classes
- [F] **Interface and inner classes**
Interface, Polymorphism & Interface, Cloning, Inner Classes, Proxies
- [G] **Graphics Programming**
Introduction to AWT & SWING, Creating Frames, Working with D Shapes, Using color Class
- [H] **Event Handling**
Basics of event handling, The AWT event hierarchy, Semantics and low-level events in AWT, Actions, Multicasting
- [I] **User- Interface Components with Swing**
Model-View-Controller Design pattern, Layout Managers, Text Input, Choice components, Menus, Dialog boxes
- [J] **Exception Handling**
Classification of exceptions, Declaring checked exceptions, How to throw an exception, Creating exception classes, Catching exceptions, Rethrowing and chaining exceptions, The finally clause, Analyzing stack trace elements
- [K] **Applets**
Applets basics, Applets HTML tags and attributes, Inter-applet communication
- [L] **Multithreading**
Thread basics, Thread states, Thread properties, Synchronization, Thread & Swing
- [M] **File and Object I/O**
Streams & Stream Classes, Data streams, Text streams, ZIP file streams, String Tokenizers, Object streams
- [N] **JDBC**
JDBC architecture, Basic JDBC programming concepts (making connection, creating statement, executing query), Prepaid statements, Scrollable and updatable Resultsets, Metadata
- [O] **Networking**
Introduction to networking, Introduction to client/server computing, Connecting to a server, Introduction to socket programming

Text Books:

1. Core Java volume I & II
By: Cays Horstmann, Gary Cornell (7th edition)
Pearson Publication

Reference Books:

1. "Complete Reference for JAVA"
By: Herbelt Schildt

Introduction to System Programming (CS 313)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	Total
4	0	2	60	40	25	25	150

[A] Basic Operating System Concepts.

Introduction to Operating System, History of Operating system, Operating system concepts, System calls, Operating system structure

[B] Processor management

Introduction to processes, Concurrent Processes, Co-operative Processes, Communicating processes, Classical IPC problems, Process scheduling

[C] Deadlock

Principle of I/O hardware, Principle of i/o software, Different layers of I/O software, Deadlocks, Deadlock prevention and avoidance., Deadlock detection and recovery, Disks

[D] Memory management

Basic memory management, Swapping, Virtual memory, Scheduling policies, Page replacement algorithms, Allocation strategies, Design issues for paging systems, Segmentation., Pure segmentation, Segmentation

[E] Data Management

Files, Directories, File System implementation, Security, Protection Mechanism.

[F] System Design

Assembler, Macro processor, Compiler, Linker & Loader

[G] Modularity

Text Books:

1. "Operating Systems"
By: Tannenbaum
Prentice-Hall
2. "Structured Programming and Operating Systems",
By: Dhamdhare
TMH

Reference Books:

1. "Operating Systems"
By: Milan Milankovic, Kogakusha
2. "Operating Systems"
By: Peterson

Semester-IV

Object Oriented Systems Development (CS 408)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	Total
4	0	2	60	40	25	25	150

- [A] **Introduction**
What is OO, Popularity, Why? Justification for OO, Concern about OO, Object Oriented System Development Methodology
- [B] **Object basics**
Introduction, An Object-Oriented Philosophy, Objects, Classes, Attributes, Behavior and methods Messages, Encapsulation and Information Hiding, Class Hierarchy, Inheritance, Multiple Inheritance, Polymorphism, Relationships and association, Aggregation, Difference between traditional approach and OO approach with example, Advance topics
- [C] **OO System Development Life cycles**
Introduction, The software development process, How to built high-quality software, OO system development - A use-case Driven Approach, OO Analysis - Use - Case Driven, Object oriented design, Prototyping, Implementation-component based development,Incremental Testing, Reusability
- [D] **Methodology, Modeling and UML**
OO Methodologies, Introduction
Rumbaugh al's OMT - Objects, Classes and Object Diagrams, Attributes, Operations and Methods and Notation for Object Diagram, Link and Associations, Advance Link and Association Concepts, Generalization and Inheritance, Grouping Constructs, A sample object model
Advance Object Modeling - Aggregation, Abstract Classes, Generalization Extension and Restriction, Multiple Inheritance, Metadata, Candidate Keys, Constrains,
The Dynamic Model, Events and States, Operations, Nested State Diagrams, Concurrency,Advance Dynamic Modeling Concepts, A sample functional model, Relation of Functional to object and Dynamic Model
The Booch Methodology - The Macro Development process, The Micro Development process, Use cases, OO Software Engineering, Business Engineering
Patterns -General and Non-negative patterns, Patterns template, Anti Patterns, Capturing Patterns
The Unified Approach - OOA, OOD, Modeling based on UML, The UA proposed Repository, The Layered Approach to Software Development
- [E] **Unified Modeling Languages**
Static and Dynamic Models, Introduction to UML, UML Diagrams, UML Class Diagrams, UML-case Diagram, UML dynamic modeling, UML Extensibility, UML Meta Model
- [F] **Object Oriented Analysis : Use Case Driven**
Business Object Analysis : Understanding the Business Layer, Use-Case Driven OO Analysis : The Unified Approach, Business Process Modeling, Use-case Model, Developing effective Documentation
- [G] **Object Analysis : Classification**
Classification Theory, Approaches for identifying Classes, Noun Phrase Approach, Common Class Pattern Approach, Use case Driven Approach, Classes, Responsibilities, Attributes and Methods, Naming Classes
- [H] **Identifying Object, Relationships, Attributes and Methods**
Associations, Super-Sub Class Relationships, A-Part-of Relationships-Aggregation, Class Responsibility : Identifying Attributes and Methods, Class Responsibility : Defining Attributes by Analyzing Use-Cases and other UML Diagrams, Object Responsibility : Methods and messages

- [I] **Object Oriented Design**
Object Oriented Design process, Object Oriented design axioms, Corollaries, Design patterns
- [J] **Designing Classes**
OO design philosophy, UML object Constraints languages, Designing classes : The process, Class Visibility, Designing Classes : Refining Attributes, Designing methods and object Inter operability
- [K] **Access Layer, Object Storage and Object Inter operability**
Objects store and persistence : An overview, DBMS systems, Logical and Physical Database Organization and Access Control, Distributed Database and Client-Server Computing, OODBMS : A survey, Conversion of OO DBMS Systems into Relational DBMS systems, Multi-Database systems, Designing Access Layer Classes
- [L] **View Layer : Designing Interface Objects**
User Interface Design, Designing View Layer Classes, Macro level process, The purpose of a view layer Interface, Prototyping and user Interface
- [M] **Software Quality Assurance**
Quality Assurance Tests, Testing Strategies, Impact of Object Orientation of Testing, Test Cases, Test Plan
- [N] **System Usability and measuring User Satisfaction**
Usability Testing, User Satisfaction test

Text Books :

1. Object Oriented System Development - using the unified Modeling Language
By: Ali Bahrami
McGraw-Hill
2. Object Oriented Modeling and Design
By: James Rumbaugh et al.
Addison-Wesley

Ref. Books :

1. Designing Object Oriented Software
By: Rebecca Wirfs Brocn,
Prentice-Hall of India Pvt. Ltd.

Operations Research (CS 402)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	2	60	40	25	25	150

- [A] Introduction to Operations Research**
Its application and scope, 1.2 Scientific method in Operations Research, 1.3 Methodology of Operations Research
- [B] Linear Programming: Graphical and Simplex method.**
Introduction and applications of linear programming, Formulation of linear programming models, Simplex Method (for maximization case, minimization case, Big -M method, Two-phase method), Special cases of Linear Programming., Dual Simplex method.
- [C] Duality in Linear programming**
Formulation of Dual Linear Problem, Interpretation of the Dual, Advantages of Duality and its applications
- [D] Integer Linear Programming.**
Types of Integer Programming Problems, Gomory's all Integer Cutting Plane Method, Branch and Bound method.
- [E] Transportation and Assignment Models.**
The Transportation Model, Mathematical Model of the Transportation Problem, Methods for finding Initial Solution (North-West Corner, Method, Least Cost Method, Vogel's Approximation Method), Test of Optimality (MODI Method), 5.5 Variation of Transportation Problem (Unbalanced Supply and Demand, Degeneracy, Alternative Optimal Solution, Prohibited Transportation Routes, Maximization Transportation Problem)., Assignment models, Solution Methods of Assignment Problem (Hungarian Method)., Variations of the Assignment Problem. (Multiple optimal solutions, Maximization case in Assignment Problem, Unbalanced Assignment Problem. Restriction on Assignments.)
- [F] Inventory control Deterministic models.**
Introduction its function role, features of inventory., Deterministic inventory models without shortages., EOQ model with constant method, EOQ model with different rates of demand in different cycles, EOQ model with replenishment is non-instantaneous., Deterministic inventory models with shortages, EOQ model with constant demand and variable order cycle time, EOQ model with constant demand and fixed reorder cycle time, EOQ model with non-instantaneous supply and shortage allowed, Probabilistic inventory models
- [G] Activity Network Analysis.**
PERT/CPM Network components and precedence relationships., Phases of project management and guideline for network constructions, Critical path analysis (Forward pass method, Backward pass method, float of an activity and event)., Probability of PERT analysis., Crashing of project network., General guidelines for network crashing,
- [H] Production Scheduling.**
Johnson's algorithm for two machines, n- job problems., Johnson's algorithm for three machines, n- job problems, Johnson's algorithm for m- machines, n-job problems.
- [I] Queuing Theory.**
Introduction, Essential features of a Queuing System, Performance measures of a Queuing System. The single-server queuing model, The single-server queuing model $\{M/M/1\}$ model, The multiple server queuing model $\{M/M/s\}$ model
- [J] Dynamic Programming.**
Introduction, Applications of Dynamic Programming, Stage coach problem, Allocation problem

Text Books:

- Quantitative Analysis for Managerial Decisions
By: J.K.Sharma.
- Operations Research
By: R Panneerselvam (PHI)

Reference Books.

- Quantitative Analysis for Business Decisions
By: Bobby Srinivasan and C.L. Sandblom
Mcgraw Hill

Recent Trends in ICT (CS 415)

SYLLABUS & SCHEME

TEACHING SCHEME						EXAM SCHEME (Marks)	
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	Total
4	0	-	60	40	25	25	150

1. Introduction to open source softwares and their Configuration

Overview of Open Source Soft ware's , Widely used open source products ,
Development philosophy ,Open source vs. closed source ,Open source software vs.
free software ,
Open source vs. source-available, Pros and cons, Development tools,
The distribution terms of open source software, open source technology importance,
Free and Open Source Software (FOSS), Configuring apache, Configuring MySQL ,
Configuring PHP

2. Overview of PHP structure and syntax

Background information of php, Using variables, operators and expressions
Conditional statements and iterations in PHP: Conditional Statements: if statement,
switch statement.
Looping : for loop, while loop, do..while statement, for each statement.
Functions and Arrays in PHP: php functions, creating array.

3. Accessing MySQL with PHP

Mysql structure, Connectivity, Querying the database

4. Form Elements, Validating user Input, Error Handling

Using radio buttons, checkbox, list box, buttons, text box, etc., processing user input,
Handling and Avoiding errors, Exception Handling.

5. Building a Content Management System

Overview of content management system, coding for reusability (header.php), User
Management, Article Publishing, Additional CMS features, Introduction to Joomla.

6. PHP and AJAX

Ajax Basics :The Purpose of Ajax ,The XMLHttpRequest Object ,Ajax using the
POST method ,Displaying and Updating Records
XML and Ajax :Creating a DOM Document with JavaScript ,Accessing, Creating and
Modifying XML Nodes ,Loading XML Data into an HTML Page ,Receiving XML
Responses ,Handling responseXML

7. Object Oriented Programming & MVC Architecture using PHP

Implementation of OOP concepts in PHP, Introduction & Implementation of MVC
Architecture.

Text Books:

1. Elizabeth Naramore , Jason Gerner , Yann Le Scouarnec , Jeremy Stolz , Michael K.
Glass: Beginning PHP5, Apache, and MySQL Web Development, Wrox , 2005.

2. Dan Squier , David Mercer , Allan Kent, Steven Nowicki , Clark Morgan , Wankyu Choi Beginning PHP5 (Programmer to Programmer) (Paperback), Wrox, 2004.

Reference Book

1. “Core PHP Programming” by Atkinson Leon, Suraski Zeev, Pearson Publication

Advanced Programming Technique – II (CS 405)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	2	60	40	25	25	150

[A] .NET PLATFORM

MS .NET PLATFORM: MS .NET INTRODUCTION, FEATURES, ADVANTAGES, MS .NET FRAMEWORK AND ARCHITECTURE

Features of .NET Platform: Multilanguage Development, Platform and Processor Independence, Automatic Memory Management, Easy Deployment, Distributed Architecture, Interoperability with Unmanaged Code, Security, Performance and Scalability.

Components of .NET Architecture

MS .NET Runtime, Managed/Unmanaged Code, Intermediate Language, Common Type System, MS .NET Base Class Library(BCL), Assemblies, Metadata, Assemblies and Modules, Assembly Cache, Reflection, Just In Time Compilation, Garbage Collection.

[B] MS .NET PROGRAMMING WITH C#

Introduction to C# .Net language, Creating Your First C# Program, C# Environment, Literals, Variables and Data Types, Operators and Expressions, Classes and Objects, Inheritance, Interfaces, Delegates, Events, Exception Handling

[C] Database Application with ADO .NET

Introduction to ADO .NET

ADO .NET Architecture: Understanding the ConnectionObject, Building the ConnectionString, Understanding DataReaders, Understanding DataSets and DataAdapters, DataTable, DataColumn, DataRow, Differences between DataReader Model and DataSet Model, Understanding the DataViewObject, Working with System.Data.OleDb, Using DataReader, Using DataSet

[D] Introduction to XML and XML usage

Text Books:

1. Beginning ASP .NET 2.0 in C# 2005 From Novice to Professional
By: Mathew MacDonald
Apress
2. Programming in C#
By: E. Balaguruswamy
Tata McGraw-Hill

Reference Books:

1. Beginning C#
Wrox Publication
2. ASP .NET Unleashed
BPB Publication
3. Professional ASP .NET 2.0
By: Alex Homer, Dave Sussman, and Rob Howard
Wrox Publication

Advanced Database Management System (CS 410)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	2	60	40	25	25	150

- A. Database high availability
 - Database mirroring
 - Log shipping
 - Replication
- B. XML
 - XML support in DBMS
 - XML creation using query
 - XML parsing & retrieval
 - XML index creation for fast retrieval – types of XML indexes
- C. Partition
 - Table partition
 - How to do table partition
 - Query performance optimization using partition
- D. Fragmentation
 - Index fragmentation
 - Data file/ data fragmentation
 - How to remove fragmentation from Index & data file
- E. Query Processing and Query Optimization
 - Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation, Other Operations
 - Evaluation of Expressions, Estimating Statistics of Expression Results, Transformation of Relational
 - Expressions, Choice of Evaluation Plans, Materialized Views
- F. Distributed databases
 - Homogeneous and Heterogeneous Databases, Distributed Data Storage, Distributed Transactions,
 - Commit Protocols
- G. Parallel databases
- H. Object oriented databases
- I. Web Databases
 - Mobile databases
 - multimedia databases
 - spatial databases
- J. Implementing security in databases, Access Control, Grant & Revoke on Views and Integrity Constraints, Discretionary Access Control, Role of DBA Security in Databases.
- K. Integrity security and repositories

L. Advanced SQL (Practical)

Text Books:

1. "Fundamentals of Database Systems", Ramesh Elmasari, Shamkant B. Navathe
5th Edition, Pearson Education.
2. "Database System Concepts", Silberschatz, Korth, Sudarshan
4th Edition, McGraw Hill International Edition
3. "Microsoft SQL Server 2008 Bible", Paul Nielsen, Uttam Parui
John Wiley and Sons

Reference Books:

1. "Oracle Database 11g The Complete Reference", Kevin Loney
McGraw Hill Ora Press

Semester-V

Mobile Application Development (CS 516)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	Total
4	0	2	60	40	25	25	150

1. Introduction to Android

- History of Mobile Software Development
- The Open Handset Alliance
- The Android Platform
- Android SDK
- Building a sample Android application

2. Android Application Design Essentials

- Anatomy of Android applications
- Android terminologies
- Application Context, Activities, Services, Intents
- Receiving and Broadcasting Intents
- Android Manifest File and its common settings
- Using Intent Filter, Permissions
- Managing Application resources in a hierarchy
- Working with different types of resources

3. Android User Interface Design Essentials

- User Interface Screen elements
- Designing User Interfaces with Layouts
- Drawing and Working with Animation Drawing and Working with Animation

4. Using Common Android APIs

- Using Android Data and Storage APIs
- Managing data using SQLite
- Sharing Data between Applications with Content Providers
- Using Android Networking APIs
- Using Android Web APIs
- Using Android Telephony APIs

Text Book:

Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)

Reference Books:

1. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd (2011)

2. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd(2009)
3. Sayed Y Hashimi and Satya Komatineni, "Pro Android", Wiley India Pvt Ltd(2009)

Advanced Java Technologies (CS 512)

SYLLABUS & SCHEME

TEACHING SCHEME			EXAM SCHEME (Marks)				Total
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	
4	0	2	60	40	25	25	150

[A]	<u>Introduction to J2EE technology</u> Web server, Application Server, N-tier architecture, JDBC Overview
[B]	<u>Java Beans</u> Introduction to Java Beans, advantages of Java Beans, The Beans Development Kit
[C]	<u>Java Servlets</u> Introduction to Java Servlet, Servlet Implémentation , Servlet Configuration, Servlet Exceptions & Servlet Lifecycle, Request & Response, Servlet Sessions, Context & Collaboration
[D]	<u>Java Servlet Pages</u> Introduction to JSP, JSP Directives, Scripting Elements, Standard Actions, Implicit Objects, Scope, JSP Tag Extensions, Integrating JSPTL into JSP pages
[E]	<u>Enterprise Java Beans (Version 3.1)</u> Introduction to EJBs, EJB Container & its services, The Client Developer's View, The Bean Provider's View, Session beans, Business logic, Entity beans, Persistence, EJB Container Services (Transaction only), JMS & Message Driven Beans (Overview)
[F]	<u>Introduction to XML and XML usage</u>
[G]	<u>Security</u> Specifying the security requirements, Programmatic Access, Control, Security & Application Design
[H]	<u>Introduction to Struts 2 Framework</u> Introduction The MVC pattern, Framework Overview, Struts architecture Struts classes - ActionForward, ActionForm, ActionServlet, Action classes Understanding struts-config.xml, Understanding Action Mappings, Struts Validation Framework Struts <s:form/> components overview. (s:checkbox,s:textfield etc....) Model driven concept, Message handling Struts flow with an example application.
[I]	<u>Introduction to Hibernate</u> Introduction to ORM, Introduction to Hibernate, Hibernate, Object Life cycle, Hibernate configuration file and mapping files, Session operations, Hibernate strategies, Mapping of relations, Lazy loading, Fetching strategies, Querying using HQL, Criteria and QBE, Hibernate Caching

Text Books (as per existing syllabus):

- Professional Java Server Programming J2EE Edition
By: Daniel O'Connor, Gordon Van Huizen, Jason Diamond and others. Wrox publication
- Sams Teach Yourself J2EE in 21 Days By: Martin Bond, Dan Haywood and others
- Struts in Action: Building Web Applications with the Leading Java Framework
By: Ted N. Husted, Cedric Dumoulin, George Franciscus, David Winterfeldt. Publisher: Manning
- Hibernate in Action
By: Christian Bauer (Author), Gavin King (Author). Publisher: Manning
- Beginning Java EE 6 with GlassFish 3, Second Edition
By: Antonio Goncalves. Publisher: Apress

Reference Books:

- J2EE Bible
- J2EE: The Complete Reference
By: TMH Laboratory:
Tools required: Tomcat 5.x application server, Java SE-6, Java documentation. Net Beans

Information System Management – Emerging Technique (CS 508)

SYLLABUS & SCHEME

TEACHING SCHEME						EXAM SCHEME (Marks)	
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	Total
4	0	2	60	40	25	25	150

[A]	Data Warehousing:
[1]	Introduction to Data Warehousing, A Multi-dimensional Data Model & Schemas, OLAP Operations & Servers An overview and definition along with clear understanding of the four key-words appearing in the definition., Differences between Operational Database Systems and Data Warehouses; Difference between OLTP & OLAP, Overview of Multi-dimensional Data Model, and the basic differentiation between "Fact" and "Dimension"; Multi-dimensional Cube, Concept Hierarchies of "Dimensions" Parameters: Examples and the advantages, Star, Snowflakes, and Fact Constellations Schemas for Multi-dimensional Databases, Measures: Their Categorization and Computation, Pre-computation of Cubes, Constraint on Storage Space, Possible Solutions, OLAP Operations in Multi-dimensional Data Model: Roll-up, Drill-down, Slice & Dice, Pivot (Rotate), Indexing OLAP Data; Efficient Processing of OLAP Queries, Type of OLAP Servers: ROLAP versus MOLAP versus HOLAP
[2]	Data Warehouse Architecture Steps for Design & Construction of A Data Warehouse, A 3-Tier Data Warehouse Architecture, Data warehouse implementation
[3]	Data Pre-processing overview The need for Pre-processing, Data Cleaning: Missing Values, Noisy Data, Data Cleaning as a Process, Data Integration & Transformation, Data Cube Aggregation; Attribute Subset Selection, Dimensionality Reduction: Basic Concepts only, Numerosity Reduction: Regression & Log-linear Models, Histograms, Clustering, Sampling, Data Discretization & Concept Hierarchy Generation, For Numerical Data, For Categorical Data
[B]	Data Mining
[1]	Data Mining Introduction An Overview; What is Data Mining; Data Mining – on What Kind of Data, Data Mining Functionalities – What Kind of Patterns Can be Mined.
[2]	Data Mining Introduction An Overview; What is Data Mining; Data Mining – on What Kind of Data, Data Mining Functionalities – What Kind of Patterns Can be Mined.
[3]	Concept Description: Characterization & Comparison: An Overview, Data Generalization & Summarization-Based Characterization, Analytical Characterization: Analysis & Attribute Relevance, Mining Class Comparisons, Mining Descriptive Statistical Measures, Concept Description & Its Mining
[4]	Mining Association Rules : Basic Concepts, Market Basket Analysis, Mining Multi-Level and single , Association Rules From Transaction Mining Multi-Dimensional Association Rules From Relational Databases & Data Warehouses, From Association Mining To Correlation Analysis, Constraint Based Association Mining
[5]	Classification & Prediction Introduction to Classification and Prediction; Basics of Supervised & Unsupervised Learning; Preparing the Data for Classification and Prediction; Comparing Classification and Prediction Methods, Classification by Decision Tree Induction, Attribute Selection Measures; Tree Pruning; Scalability and Decision Tree Induction, Rule-based Classification: Using IF-THEN Rules for Classification; Rule Extraction from a Decision Trees; Rule Induction Using a Sequential Covering Algorithm, Bayesian Classification: Bayes' Theorem, Naïve Bayesian Classification; Bayesian Belief Networks
[6]	Cluster Analysis Introduction to Cluster Analysis; Types of Data in Cluster Analysis; A Categorization of major

Text Books:

Jiawei Han & Micheline Kamber, "Data Mining: Concepts & Techniques", Morgan Kaufmann Publishers (2002)

Reference Books:

1. Sam Anahory & Dennis Murray, Data Warehousing In The Real World, Addison-Wesley, 2000
2. W. B. Frakes & R. Baeza – Yates Eds., Information Retrieval: Data Struct & Algorithms, Prentice Hall, 1992
3. Michael J A Berry & Gordon Linoff, Data Mining Techniques: For Marketing, Sales, Customer Support,
4. Pieter Adriaans & Dolf Zantinge, Data Mining, Pearson Education Asia, 2001 (ADDED) CRISP DM 1.0 User Guide

Software Testing (CS 513)

SYLLABUS & SCHEME

TEACHING SCHEME						EXAM SCHEME (Marks)	
Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termwork	Total
4	0	2	60	40	25	25	150

[A]	<u>Software Testing Terminology and Methodology</u> Software Testing Terminology, Software Testing Life Cycle, Writing a Policy for Software Testing, Economics of Testing, Testing – An organizational Issue, Management Support for Software Testing, Fig. of Software Testing Methodology, Risk associated with not meeting customer needs, Developing Test Strategy
[B]	<u>Overview of Software Testing Process</u> Advantages of Following a Process, The Cost of Computer Testing, The Seven-Step Software Testing Process
[C]	<u>Verification and Validation</u> Verification and Validation (V&V) Activities, Verification, Verification of Requirements, Verification of High –level Design, Verification of Low –level Design, How to Verify Code? ,Validation
[D]	<u>Static Testing</u> Inspections, Structured Walkthroughs, Technical Reviews
[E]	<u>Validation Activities</u> Unit Validation Testing, Integration Testing, Function Testing, System Testing , Acceptance Testing
[F]	<u>Regression Testing</u> Progressive vs. Regressive Testing, Regression Testing Produces Quality Software, Regression Testability, Objectives of Regression Testing, When is Regression Testing Done? , Regression Testing Types, Defining Regression Test Problem, Regression Testing Techniques
[G]	<u>Test Management</u> Test Organization, Structure of Testing Group, Test Planning, Detailed Test Design and Test Specifications
[H]	<u>Software Metrics</u> Need for Software Management, Definition of Software Metrics, Classification of Software Metrics, Entities to be Measured, Size Metrics
[I]	<u>Testing Metrics for Monitoring and Controlling the Testing Process</u> Measurement Objectives for Testing, Attributes and Corresponding Metrics in Software Testing, Attributes, Estimation Models for Estimating Testing Efforts (include only topic Halstead Metrics), Test Point Analysis (TPA) – introduction only
[J]	<u>Testing Process Maturity Models</u> Need for Test Process Maturity, Measurement and Improvement of a Test Process, Test Process Maturity Models
[K]	<u>Automation and Testing Tools</u> Need for Automation, Categorization of Testing Tools, Selection of Testing Tools, Cost Incurred in Testing Tools, Guidelines for Automated Testing, Overview of Some Commercial Testing Tools
[L]	<u>Testing Object Oriented Software</u> Object-Oriented Testing
[M]	<u>Using Agile Methods to Improve Software Testing</u> The importance of Agility, Building an Agile Testing Process, Agility Inhibitors, Is Improvement Necessary, Compressing Time, Challenges, Solutions , Measuring Readiness , The Seven-Step Process

Text books:

1. Software Testing Principles and Practices - By Naresh Chauhan, Oxford
2. Effective Methods of Software Testing (3rd Edition) - By William E Perry Wiley, India

Reference Books:

1. Software Testing principles and practices- By Srinivasan Desikan, Gopalaswamy Ramesh, Pearson Ed.
2. Software testing (2nd Edition) – By Ron Patton, Pearson Education
3. Effective Software Testing 50 specific ways to improve your testing- By Elfriede Dustin, Pearson Edu.

**Project
(CS 504)**

	TEACHING SCHEME						EXAM SCHEME (Marks)	
	Lecture	Tutorial	Practical	Theory (3 hrs)	Sessional (1 hr)	Practical /Viva	Termw ork	Total
Project	-	0	6	--	--	100	50	150
Seminar	-	0	-	--	--	--	50	50

Semester-VI

Subject Code	Subject	Teaching Scheme			Exam Scheme				Total
		Lec	Tut	Prac	Th	Sess	Prac /Viva	TW	
CS 601	Project	-	-	24	--	--	300	100	400
CS 602	Seminar	-	-	6	--	--	100	--	100
Total									500