Course Code	Course Title	L	T	P	C
MC1311	PROGRAMMING IN C	3	-	3	4

Course Rationale:

- To learn the programming concepts and write simple programs in C
- To understand sequential steps or procedures to solve any given problem
- To enable the learner to become an application developer using this language

Course Objectives:

At the end of this course the learner is expected :

- To acquire basic knowledge about Programming in C
- To gather extensive knowledge in C programming and developing programming skills
- To learn about pointers concepts and functions using procedures
- To strengthen the knowledge on structures, arrays etc., of C programming

UNIT 1 : INTRODUCTION **9**

Introduction- Identifiers and keywords, Constants and variables, Arrays – Introduction single dimension, Two-dimension, Multi-dimension, Declarations – Expressions and statements, Types of operators, Library functions Input statements, Output statements

UNIT 2 : CONDITIONAL STATEMENTS **9**

Conditional statements-If …else, While, Programs, Do while Programs, Looping
Switch.case, Break and continue, Comma operator, goto statement, switch case

UNIT 3 : FUNCTIONS **9**

Functions-Definitions and prototypes, Exercise programs, Passing arguments to a, function, Storage class variables, Arrays –single dimension, Arrays with two dimensions, Matrix manipulations, String operations.

UNIT 4 : POINTERS **9**

Fundamentals of pointers-Pointer declarations, Passing pointers to a function,
Pointers and one dimensional arrays, Dynamic memory allocation, Operations on pointers, Pointers and one dimensional arrays, Arrays of pointers, Passing functions to other functions.

UNIT 5 : STRUCTURE **9**

Defining structure-Processing a structure, User defined data types, Structure and pointers, Passing structures to functions, Self referential structures, Opening and closing data file, Reading and writing a data file, Processing data file, Unformatted data files.

Text Books:

1. E.Balagurusamy – **Programming in ANSI C** – Tata McGraw Hill – Second Edition – 2008.
2. Yashavant P.Kanetkar – **Let us C** – Infinity Science Press – 8th Edition – 2008.

References:

1. Gottfried B.S. – **Theory and problems of Programming with C** – Schaum's Outline Series – Tata McGraw Hill – 1997 (Chapter 01 – 12)
2. Kanetkar Y – **Let us C** – BPB Publications – 1995
3. Deitel H.M. & Deitel .P.J. – **How to Program C** – Prentice Hall India – 2001.
4. Kamthane, Ashok N – **Programming in C**, 2nd Edition, Pearson Education – 2013.
5. Yashavant Kanetkar – **Exploring C** – BPB Publications – Second Edition – 2003.

Course Code	Course Title	L	T	P	C
MC1312	DATA STRUCTURES	3	-	-	3

Course Rationale:

- To learn Several data structure concepts like stack, queue, linked list, trees and files
- To learn the Applications of data structures.
- To improve the Problem solving quality using data structure techniques.
- To enable the learner to aim for careers in Data Analysis and Software Designs.

Course Objectives:

At the end of this course the learner is expected :

- To gather extensive knowledge in Data Structures.
- To strengthen the knowledge on structures, arrays etc., of Data Structures.

UNIT 1 : DATA STRUCTURES AND ALGORITHMS 9

Data structures & algorithms-Introduction to Data Structures and algorithms, Data structure operations, control structures, complexity of algorithms, asymptotic notations for complexity, Variables, data types, string operations, word processing, pattern matching algorithms, Linear Arrays, Representation of linear arrays, traversing linear arrays, inserting and deleting linear arrays, pointers, Records.

UNIT 2 : LINKED LISTS 9

Linked lists-Representation of linked lists in memory, traversing a linked list, searching a linked list, insertion in to a linked list , deletion from a linked list-header linked lists, memory allocation – two way lists, operations on two way lists .

UNIT 3 : STACKS AND QUEUES 9

Stacks & queues-Array representation of stacks, Linked representation of stacks
Arithmetic expressions, Towers of Hanoi, Array representation of queues, Linked representations of queues, Deques, priority queues.

UNIT 4 : TREES 9

Trees-General Trees- binary Trees-representation of binary trees, traversing, binary trees -traversal algorithms of binary trees, path lengths- huffman's algorithm, graph theory terminology, representations of graphs, warshalls's algorithms, operations on graphs, traversing a graph-topological sorting

UNIT 5 : SORTING 9

Sorting-bubble sort, binary search, linear search, Quick sort, Heap sort, insertion sort, selection sort, merging, Radix sort, Hashing

Text Books:

1. Seymoutr Lipschutz – **Data Structures** – Tata Mc Graw hill – 2 nd Edition 2006 (chapters 1 to 10)
2. Ellis Horowitz & Sartaj Sahni – **Fundamentals of Data Structures**- Galgotia Book Source – 2nd Editions – 1992 (chapter 10)

References:

1. V. Aho, E.Hopcroft , D.Ullman – **Data Structures and Algorithms** – Pearson Education – 1st Edition - 1993.
2. Ellis Horowitz – **Fundamentals of Computer Algorithms** – Universities Press – 2nd Edition – 2008.
3. Alfred V. Aho Johne. Hopcroft – **Data Structures and Algorithms** – Pearson – 2008.
4. Mark Allen Weiss – **Data Structures and Algorithm Analysis in C** – Pearson – 2nd Edition – 2008.

Course Code	Course Title	L	T	P	C
MC1313	DIGITAL COMPUTER FUNDAMENTALS	3	0	0	3

Course Rationale:

- To impart knowledge on the fundamentals of digital systems to the students.
- To describe the logical functioning of the circuits to the learners.
- To enable the learner to become architecture software engineer.

Course Objectives:

At the end of this course the learner is expected :

- To Understand the concept of digital systems
- To Operate on various number systems
- To Simplify Boolean functions
- To Distinguish logical and combinational circuits
- To Design counters and understand the working of arithmetic logic and control unit

UNIT 1 :OVERVIEW OF NUMBER SYSTEMS **9**

Binary Number System, Binary to Decimal & Decimal to Binary Conversion- Hexadecimal number System, Hexa to Decimal & Decimal to Hexa conversion- Hexa to Binary & Binary to Hexa Conversion- Octal to Decimal and Decimal to Octal Conversion- Basic Gates AND,OR, NOT- Logic Circuits- Logical Expressions- SOP, POS- NAND, NOR, EX-OR and EX-NOR.

UNIT 2 :BOOLEAN ALGEBRA AND K-MAP **9**

Laws of Boolean Algebra- DeMorgan's Theorems- Simplification of Boolean Functions- Karnaugh Map- Don't Care conditions- Simplification using K-Map- Mc Clausky Method- Simplification using Mc Clausky Method.

UNIT 3 :COMBINATIONAL CIRCUITS **9**

Binary addition & Half adder- Full adder & Four bit binary adder- BCD adder & Half subtractor- Full subtractor- Multiplexer- Demultiplexer- Decoder & Encoder- SR Flip-flop & D Flip-flop- JK Flip-flop & T Flip flop.

UNIT 4 :SEQUENTIAL CIRCUITS **9**

Registers- Shift Registers- Asynchronous counters- Synchronous counters- Ring counter- Design of synchronous counters.

UNIT 5 :ALU **9**

Introduction to Arithmetic Unit- Design of Arithmetic Unit- Logic Unit- Design of Logic Unit- Arithmetic & Logic Unit- Design of ALU- Control Unit- Design of Control Unit.

Text Books:

1. Bartee T.C. – **Digital Computer Fundamentals** – McGraw Hill - 2008
2. Morris Mano M – **Digital Logic and Computer Design** – Pearson Education – 2008

References:

1. Vijayendran V – **Digital Fundamentals** – S.V. Publishers - 2003
2. Donald P.Leach, Albert Paul Malvino, Goutham Saha – **Digital Principles and Applications** – Tata McGraw Hill – 6th Edition (Special Indian Edition) – 2008.

Course Code	Course Title	L	T	P	C
MC1314	OPERATING SYSTEMS	3	0	0	3

Course Rationale:

- To introduce different types of Operating Systems.
- To learn about components of Operating Systems.
- To understand Process Management and Storage Management.
- To implement Input / Output and File Systems.
- To enable the learner to aim for careers in Software Development.

Course Objectives:

At the end of this course the learner is expected :

- To Implement Various Operating System Concepts.
- To Perform Scheduling and memory management.
- To Handle Components of Operating System and Deadlocks.
- To Use File Systems.

UNIT 1: INTRODUCTION TO OPERATING SYSTEM **6**

Basic OS Concepts, Operations- Architecture of OS- OS System Services- System Calls-Types- System Programs- System Design and Implementation.

UNIT 2 : PROCESS MANAGEMENT **8**

Overview, Process Scheduling- Operations on Processes – Cooperating Processes- Interprocess Communication-Shared Memory - Message Passing Systems- CPU Scheduling- Scheduling Concepts- Scheduling Criteria- Scheduling Algorithms- Multiprocessor Scheduling.

UNIT 3 : PROCESS COORDINATION **9**

Critical Section Problem- Semaphores-Usage_Implementation- Classic Problems of Synchronization-Critical Regions- Monitors-Concepts- System Models-Concepts- Deadlocks – Characterization – Handling Deadlocks- Pointers Deadlock Prevention – Avoidance – Detection- Deadlock Recovery.

UNIT 4 : MEMORY MANAGEMENT **11**

Background, memory management- Swapping-Concepts- Contiguous Memory Allocation- Paging-Basic Method-Hardware support - Protection-Shared Pages- Structure of page table- Segmentation-Basic Method-Hardware- Virtual Memory-Basic Method- Demand Paging-Basic Concepts-Performance- Page Replacement Methods- Thrashing-Cause of Thrashing-Working set Model- Error handling during file operations.

UNIT 5 : STORAGE MANAGEMENT **11**

File Concepts-Attributes-Operations-Types-Structure- Access methods-Sequential-Direct Access-Directory Structure-overview-levels of directory- File System Structure-Implementation- Directory Implementation Linear List-Hash Table- Allocation Methods-Contiguous – Linked-Indexed- NFS-overview-Mount Protocol-NFS Protocol-Path Name Translation-Remote Operations- Disk Structure-Attachments- Disk Scheduling-FCFS-SSTF-SCAN-C-SCAN-LOOK- RAID Structure-RAID Levels-Linux System-Design Principles –Process Management-Scheduling-Memory Management-File System-Input and Output-Interprocess Communication-Network Structure-Security.

Text Books:

1. Silberschatz, Galvin & Gagne – **Operating system principles** - John Wiley & Sons – 7th Edition 2006 (Chapters 1,2,3,5,6,7,8,9,10,11,12,22)

References:

1. Milan Milenkovic – **Operating System Concepts and Design** - McGraw Hill 2003.
2. Andrew S. Tennenbaum – **Modern Operating System** – Prentice Hall India 1997.
3. Deital - **An Introduction to Operating System** – Pearson Education – 1990.

Course Code	Course Title	L	T	P	C
MC1315	WEB TECHNOLOGY	3	0	2	4

Course Rationale :

- To provide knowledge on Internet and its related concepts.
- To enrich the knowledge of scripting languages.
- To introduce advance HTML tags.
- To enable the learner to become a Web Designer.

Course Objectives:

At the end of this course the learner is expected :

- To familiarize basics of Internet.
- To manage the Web designing and uploading.
- To understand various scripting languages like Java scripting and VB scripting.

UNIT 1 : INTERNET AND EMAIL CONCEPTS **9**

Introduction to networks, LAN,MAN and WAN, History of the Internet, Intranet, E-mail Concepts, Sending and Receiving files by E-mail, Usenet Newsgroup Concepts, Reading Usenet Newsgroups

UNIT 2 : WORLD WIDE WEB **9**

Web page Creation, World Wide Web Concepts, Domain name and Host Name, Web site creation concepts, Creating web pages by Hand Structure of the Database, Creating web pages using web page Editors, Uploading web pages. Rules for Uploading WebPages. Procedure for Domain name Registration.

UNIT 3: BASIC HTML CONCEPTS **9**

Introduction to HTML, Links and Addressing, HTML and Images, Backgrounds, Colors and Text, Introduction to Layout, Advanced Layout Tables, Frames, Forms.

UNIT 4 : CORE JAVA SCRIPT **9**

Core Java Script Concepts**,** Introduction to Java Script, Variables in Javascripts Types of constants in Javascript Expressions and Conditions, Relational operators Data types, Flow control, Functions, Objects, Data type conversion and equality, Forms and Data

UNIT 5 : VB SCRIPT **9**

Introduction to VBScript**,** Using VBScript in an HTML page, VBScript variables, VBScript constants , Operators, Conditional statements, Looping, Sub procedures and Function procedures, Using VBScript with HTML form controls, Data handling functions, String functions, Date and time functions

Text Books:

1. Margaret Levine Young – **Internet-The Complete Reference** –McGraw Hill – Second Edition – 2002.
2. Paul Wilton & Jeremy Mc Peak – **Beginning Javascript** – 4th Edition – 2009.
3. Noel Jerke et al - **VB Script, Interactive Course** -Techmedia Publication, Waite Group Pr, 1997.

References:

1. Thomas A. Powell - **The complete Reference HTML** -3rd Edition -2007.
2. Stephen Wynkoop – **Running a perfect website**, QOE – 1999.

Course Code	Course Title	L	T	P	C
MC1316	BUSINESS COMMUNICATION	2	0	0	2

Course Rationale:

- To understand the implications of individual and group behavior in organizational context.
- To achieve interpersonal communication skills
- For aspiring careers in Information Technology field by developing communication skills.

Course Objectives:

At the end of this course the learner is expected :

- To describe the basic role of Business Communication
- To build the writing, speaking and listening skills
- To create various forms of letters and generate reports
- To develop interview skills and Curriculum Vitae preparation

UNIT 1 : Communication Process and Business Presentations **9**

Introduction to Business Communication, Characteristics and Methods of Business Communications Models of Communication Processes, Listening Skills, Improving the Listening Ability, Business Presentation, Determination of Presentation Technique Delivery of Presentation.

UNIT 2 : Group Discussions and Negotiations **9**

Conducting Meetings, Minutes of Meeting Pedagogy of Group Discussions, Successful Group Discussion Techniques, Negotiations – An Introduction Various Approaches to Negotiation Negotiation Process Non-Verbal Skills in Negotiations Case Study.

UNIT 3 :Principles of Business Writing **9**

Advantages of Written Communications, Business Writing, Writing Process, Grammar Problems – 1, Grammar Problems – 2, Grammar Problems – 3, Curriculum Vitae (CV) Vs Resume, Preparation of CV, Case Study

UNIT 4 :Technical Writing & Official Correspondence **9**

Technical Writing – 1, Technical Writing – 2, Guidelines for Writing a Proposal, Effective Reading – 1, Effective Reading – 2, Effective Reading – 3, Basics of Correspondence – 1, Basics of Correspondence - 2, Case Study

UNIT 5 :Case analysis and Role of technology for Effective Communication **9**

Case Analysis, – An Introduction Case Analysis Methodology – 1, Case Analysis, Methodology – 2, Approaches to Case Analysis, Development of Communication Technology, Merits and Demerits of Information Technology, Internet and its uses in Business Communication, Guidelines for Video Conferencing , Case Study

Text Books:

1. Madhukar, R.K. - **Business Communication** - Vikas Publishing House - 2010.
2. Monipally, Mathukutty - **Business Communication and Strategies** - Tata McGraw-Hill Co. Ltd. - 2001.

References:

1. Chabbra, T.N. - **Business Communication Concepts and Skills** - Sun India Publication, 2013.
2. Sinha, K.K. - **Business Communication** - Galgotia Publishing Company - 2012.
3. Chaturvedi, P.D. and Mukesh Chaturvedi - **Business Communication: Concepts, Cases and Applications** - Pearson Education - 2013.

Course Code	Course Title	L	T	P	C
MC1321	OBJECT ORIENTED PROGRAMMING USING C++	3	0	3	4

Course Rationale:

- To introduce the concepts of Object Oriented Programming.
- To learn the concepts of class & objects.
- To perform Overloading of operators, functions, constructors and File Handling.
- To enable the learner to become an application developer using this language

Course Objectives:

At the end of this course the learner is expected :

- To implement Inheritance.
- To perform Overloading and Polymorphism.
- To use Templates and Exceptions.
- To do effective file management.

UNIT 1: INTRODUCTION TO OBJECT ORIENTED PROGRAMMING AND C++ 8

Object Oriented Programming (OOP) Paradigm, Basic concepts of (OOP)-Benefits of OOP -Object Oriented Languages - Applications of OOP -Tokens, Expressions - Control Structures -Functions in C++.

UNIT 2: CLASS, OBJECTS AND OVERLOADING 9

Classes and Objects -Constructors, parameterized Constructors -Multiple Constructors in a class - Constructors with default Arguments - Copy Constructors -Dynamic Constructors -const Objects - Destructors -Operator Overloading-Type Conversions .

UNIT 3: INHERITANCE, POINTERS & POLYMORPHISM 9

Inheritance: Extending Classes: Introduction - Defining derived classes - single Inheritance - Multilevel, Multiple –Inheritance-Hierarchical and Hybrid Inheritance-Virtual Base Classes, -Abstract Classes-Pointers -Virtual Functions- Polymorphism.

UNIT 4: I/O OPERATIONS AND FILES 10

Managing Console I/O Operations: C++ Streams, C++ Stream Classes-Unformatted I/O Operations - Formatted Console I/O operations-Managing output with Manipulators -Working with Files: Classes for File Stream Operations -Opening and closing a file and Detecting end-of-file,File Modes, File Pointers and their Manipulations - Sequential input and Output Operations -Updating a File(Random Access) -Error handling during file operations

UNIT 5: TEMPLATES & EXCEPTIONS 9

Templates: Class Templates, Class templates with multiple parameters - Function Templates - Function Templates with multiple parameters -overloading of Template functions - Member function templates-Exception Handling -Introduction to Standard Template Library(STL): Components of STL- Containers, Algorithms, Iterators -

Application of Container Classes, Function Objects.

Text Books:

1. E. Balagurusamy - **Object Oriented Programming with C++** -TATA McGraw Hill- Third Edition -2007.(Chapter 1 to 14).
2. Herbert Schildt - **C++ The Complete Reference**-TATA McGraw Hill – Third Edition- 2001.

References:

1. Rob McGregor -**Using C++** -Prentice – Hall India-2001
2. Al Stevens – **C++ Programming** –Wiley Dreamtech india (P) Ltd. – 7th edition -2003.

Course Code	Course Title	L	T	P	C
MC1322	DATABASE MANAGEMENT SYSTEMS	3	0	3	4

Course Rationale:

- To understand the concepts of database security and reliability.
- To enable the learner to become a Database application programmer, Database Analyst etc.

Course Objectives:

At the end of this course the learner is expected :

- To gain knowledge in the areas of database design and SQL programming.
- To understand relational database technology for building applications for the current trend.
- To analyze a business situation and build suitable database applications.

UNIT 1: INTRODUCTION AND CONCEPTUAL MODELING 9

Purpose of database system-Advantages of DBMS over file processing System-View of data-Data abstraction-Data Independence, Data models-Database languages-Database users-Database Administrator-DBMS system structure.

UNIT 2: SQL AND PL/SQL 9

DDL-DML-DCL-TCL- Date functions-string functions-Joins-Set Operators-group functions-PL/SQL Block-Exceptions- Triggers.

UNIT 3: RELATIONAL MODEL 9

ER model basic concepts-Relational Algebra, Pitfalls in relational Database design-Decomposition, Normalization-I NF- 2NF-3NF Normalization using Functional dependency-BCNF- Multi value dependency-BCNF- Multi value dependency- 4NF Normalization - 5NF.

UNIT 4: DATA STORAGE 9

Primary and Secondary storage devices-Primary and Secondary storage Sevices-operation on files - Heap file-sorted files-Hashing Techniques- Index structure of files-Different types of indexes-B-tree-B+tree.

UNIT 5: TRANSACTION AND RECOVERY MANAGEMENT 9

Transaction Processing - Serializability and Schedules- Concurrency control-Types of locks-Two Phase locking-Deadlock-Timestamp based concurrency control-Recovery Techniques- Immediate Update-Deferred Update- Shadow paging.

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan- **Database System concepts**- McGraw Hill, 2005

References:

1. Kevin Loney , Gerorge Koch - **Oracle9i The Complete Reference** - McGraw Hill -2002.
2. Ragu Ramakrishnan - **Database management Systems** - WCB/Mc Graw Hill - 1998
3. Date C.J – **An Introduction to database** – version 2 – Addison Wesley -2003

Course Code	Course Title	L	T	P	C
MC1323	DATA COMMUNICATION AND NETWORKING	3	0	0	3

Course Rationale:

- To understand data communication and networking with little or no background in data communication.
- To enable the learner to become managers, developers, IT staff and help desk professional.

Course Objectives:

At the end of this course the learner is expected :

- To get a general overview of "Data Communication and Networking" and physical layer.
- To know the functions of Data link layer
- To understand network layer functions and protocols used in it.
- To learn about transport layer and briefly about cryptography.
- To understand the functions of application layer.

UNIT- 1: OVERVIEW AND PHYSICAL LAYER MEDIA 12

Data communications-Networks-Protocols and standards-OSI model-Layers in the OSI model-Layers in the OSI model-TCP/IP Protocol suite-Addressing.-Analog and Digital-Periodic analog signals-Digital signals-Transmission impairment-Analog-To-digital conversion-Transmission modes-Categories of Multiplexing-Two techniques of spread spectrum-Guided and Unguided media-Circuit switched,datagram-Virtual-circuit networks.

UNIT- 2: DATA LINK LAYER 12

Block coding-Cyclic codes-Error detection method – Checksum -framing-flow and error control-Noiseless channels-Noisy channels – I-Noisy channels – II-High-level Data Link Control-Wireless LAN Technology - IEEE802.11-Wireless LAN Technology – Bluetooth - SONET Architecture and layers-Frame Relay-Asynchronous Transfer Mode.

UNIT-3: NETWORK LAYER 8

IPV4 Addresses-IPV4-IPV6-Address mapping-Internet Control Message Protocol-Internet Group Management Protocol-Delivery-Forwarding-Unicast Routing protocols-multicast routing protocols .

UNIT-4: TRANSPORT LAYER AND SECURITY 7

Process-to-process delivery-User Datagram Protocol-Transmission Control Protocol-Stream Control Transport Protocol-Congestion Control-Symmetric key cryptography-Asymmetric key cryptography.

UNIT-5: APPLICATION LAYER 6

DNS-Remote logging-E-mail-File transfer-Hyper Text Transfer Protocol-Simple Network Management Protocol-Digitizing audio and video-Audio and video compression-Streaming stored audio/video

Text Books:

1. Behrouz A Forouzan **- Data communication and networking** – Tata McGraw Hill – 4thEdition – 2004.
2. Andrew S. Tanenbaum - **Computer Networks –** Prentice Hall India – 4th Edition – 2003.

References:

1. William Stallings – **Data and computer communications –** Prentice Hall India – Sixth Edition **–** 1997.

Course Code	Course Title	L	T	P	C
MC1324	COMPUTER ARCHITECTURE	3	0	0	3

Course Rationale:

- To learn the structure and behavior of the various functional modules of the computers.
- To provide the hardware knowledge for the user.
- To enable the learner to aim careers on Hardware Engineering and Academics.

Course Objectives:

At the end of this course the learner is expected :

- To understand the basic principles of the computer system.
- To describe the internal operations of the computer system.
- To interpret the architecture of the computer system.

UNIT 1: REGISTER TRANSFER LANGUAGE **8**

Register Transfer Language - Register Transfer - Bus and Memory Transfer - Arithmetic Micro Operations - Arithmetic Micro Operations-Continue - Logic Micro Operations - Shift Micro Operations - Arithmetic Logic Shift unit – Unit test.

UNIT 2: BASIC COMPUTER OPERATIONS **9**

Instruction Codes - Computer Registers-Computer Instructions - Timing and Control - Instruction Cycle - Memory reference Instructions - Input Output and Interrupt - Complete Computer Description - Design of Basic Computer - Design of Accumulator logic.

UNIT 3: CPU ORGANIZATION **10**

Introduction to CPU - General Register Organization - Stack Organization - Instruction Formats - Addressing Modes - Data Transfer and Manipulation - Data Transfer and Manipulation-cont. - Program Control – RISC – CISC.

UNIT 4: I/O INTERFACE **10**

Peripheral Devices - Input Output Interface - Asynchronous Data Transfer - Asynchronous Data Transfer-cont. - Modes of Transfer - Priority Interrupt - Priority Interrupt-cont. – DMA – IOP - Serial Communication.

UNIT 5: MEMORY ORGANIZATION **8**

Memory Hierarchy - Main Memory - Auxiliary Memory - Associative Memory - Cache Memory - Virtual Memory - Virtual Memory Continuation - Memory Management Hardware.

Text Books:

1. M. Morris Mano –**Computer System Architecture** – Prentice Hall of India – 2002

References:

1. Sivarama P.Thandamudi - **Fundamental of Computer Organization & Design** –Springer 2003.

Course Code	Course Title	L	T	P	C
MC1325	COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS	3	0	0	3

Course Rationale:

- To familiarize the basics of computer graphics
- To understand the working principle of graphics hardware and graphics primitives
- To understand how to manipulate an image and how to eliminate hidden lines
- To illustrate the basics of illumination , shading on objects, the coloring model
- To understand the different components, different file formats and various tools of multimedia system
- To enable the learner for aspiring careers in the areas of graphical design and multimedia based software development.

Course Objectives:

At the end of this course the learner is expected:

- To use different input interactive techniques and different input modes
- To apply algorithms in real life applications
- To write algorithms for any graphics elements, to do transformation on 2D and 3D images and to eliminate the hidden lines, apply illumination and shading
- To clip the bigger portions of images, which are larger in the screen
- To work on various multimedia tools

UNIT- 1 : GRAPHICS DISPLAY DEVICES AND INPUT DEVICES **7**

Introduction to Raster scan displays-Random scan displays - working principle of CRT - Storage tube displays- refreshing- flickering-interlacing color monitors Display processors-resolution- aspect ratio-persistence Graphics adaptors - Hard copy devices- dot matrix- inkjet laser printers working principles of keyboard -mouse scanner- digitizing camera- track ball- tablets and joysticks Graphics software

UNIT – 2: GRAPHICS PRIMITIVES AND 2D TRANSFORMATION 11

Scan conversion techniques-image representation- Line drawing- simple DDA- symmetric DDA- Bresenham's line drawing Algorithm - Bresenham's circle drawing Algorithm- Ellipse-generating algorithm- curves- parametric function-2D graphics-2D Transformation-Translation-Rotation-Scaling-shearing-Reflection- Homogeneous representation of all transformation - Rotation about pivot point- scaling about fixed point- Composite transformation

UNIT-3: 3D TRANSFORMATION AND CLIPPING 7

3D graphics-3D transformation-matrices- world coordinates system- screen coordinate system-Windowing transformation- 3D viewing- parallel projection- Perspective projection- Perspective projection- Point Clipping- Line Clipping Algorithms- Polygon Clipping algorithms

UNIT- 4: HIDDEN SURFACE ELIMINATION, ILLUMINATION MODELS, SHADING AND COLOR MODELS 12

Introduction to Hidden Surface elimination- Hidden surface elimination algorithms- Back-face detection algorithm-Depth-buffer method(painters algorithm)- Scan-line method- Depth-sorting method-BSP-Tree method-Area subdivision method(Warnock's algorithm)- Ray-casting method-Basic illumination model-diffuse reflection- specular reflection-phong shading-Gouraud shading-Ray-tracing-Color models – I-Color models – II

UNIT – 5: MULTIMEDIA SYSTEMS 8

Multimedia components- Multimedia Hardware-SCSI- IDE-MCI- Multimedia data and file formats-RTF-TIFF (Contd…)- MIDI- JPEG- DIB- MPEG- Multimedia Tools- Presentation tools- Authoring tools- Presentation tools

Text Books:

1. Donald Hearn and M.Pauline Baker - **Computer Graphics -** 2nd Edition , PHI publishers,1994
2. William M. Newman and Robert F.Sproul - **Principles of interactive computer graphics -** 2nd Edition, McGraw Hill publishers,1997
3. James E. Shuman, - **Multimedia in Action -** Thomson / Vikas Publishing House,1998
4. Tay Vaughan - **Multimedia: making it work -** Tata McGraw Hill, 4th Edition – 1999.

References:

1. Folay Vandam, Feiner, Hughes - **Computer Graphics Principle & Practice -**Addison Wesley,2/e. 1997
2. Prabhat k Andleigh, Kiran Thakral - **Multimedia System Design -** PHI,1996
3. David F.Roger - **Procedural Elements of Computer Graphics -** McGraw Hill-1998

Course Code	Course Title	L	T	P	C
MC1326	DESIGN AND ANALYSIS OF ALGORITHMS	3	0	0	3

Course Rationale:

- To analyze the algorithms, with the optimization on time and memory effectiveness.
- To develop the system design based on the given requirements.
- To enable the learner to aim for careers in software development.

Course Objectives:

At the end of this course the learner is expected :

- To study the Basics of algorithms through time and space complexity, Searching and Sorting Techniques and "Divide and Conquer" Methods.
- To design the Greedy Method and Minimum Cost Spanning Tree procedures.
- To understand the Dynamic Programming Basics, Traversal and Backtracking.
- To know the "Branch and Bound" Technique and Lower Bound Theory.
- To familiarize the NP-Complete and NP-Hard Problems.

UNIT –1: DIVIDE AND CONQUER METHOD 9

Introduction to algorithm- Algorithm Specification - Performance Analysis I Space Complexity- Performance Analysis II Time Complexity- Asymptotic Notations -Divide and Conquer Binary Search- Finding the Maximum and Minimum -Quick sort - Strassens Matrix Multiplication

UNIT –2: GREEDY METHOD 9

Greedy Method – General Method-Knapsack Problem -Tree Vertex Splitting Problem –Job Sequencing with Deadlines -Minimum Cost Spanning Trees -Prims Algorithm –Kruskal Algorithm - Transitive Closure - Single Source Shortest Paths - Topological Ordering

UNIT- 3: DYNAMIC PROGRAMMING AND BACKTRACKING 9

Dynamic Programming – Basic Method - Multistage Graphs - String Editing - Basic raversal and Search -Techniques for Graphs- Bi-connected Components and DFS – Backtracking Introduction - Backtracking the General Method - 8 Queens Problem - Sum of Subsets

UNIT – 4: BRANCH AND BOUND AND LOWER BOUND THEORY 9

Branch and Bound : The Method-LC Search - Branch and Bound : The Method-Bounding 0/1 Knapsack Problem-LC Branch and Bound - 0/1 Knapsack Problem-FIFO Branch and Bound - Traveling Salesperson Problem-I - Traveling Salesperson Problem II - Lower Bound Theory-comparison trees - Oracles and Adversary Arguments I - Oracles and Adversary Arguments-II

UNIT- 5: NP COMPLETE /HARD PROBLEMS AND APPROXIMATION ALGORITHMS 9

NP Complete and Hard Problems – Basic Concepts-I - NP Complete and Hard Problems – Basic Concepts-II - Cooks theorem-I - CDP, NCDP, CNDP - Cooks theorem-II - DHC, TSP, AOG - NP-Hard Graph Problems-I - NP-Hard Graph Problems-II – Approximation algorithms -Introduction ε – Approximations-scheduling independent tasks ε – approximations-Bin Packing

Text Books:

1. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran - **Fundamentals of Computer Algorithms** - University Press – Second Edition-2008.

References:

1. A.A.Puntambekar- **Design and analysis of algorithms**- First Edition-Technical publications, 2010
2. Chandra Mohan-**Design and analysis of algorithms**-Prentice Hall of India -2008.

Course Code	Course Title	L	T	P	C
MC1327	DISCRETE MATHEMATICS	3	2	0	4

Course Rationale:

- To impart analytical ability and to solve real life problems pertaining to branches of Computer Applications.

Course Objectives:

At the end of this course the learner is expected :

- To understand Logic and mathematical reasoning and to count /enumerate objects in a Systematic way.
- To understand Mathematical induction and recursion.
- To understand Set theory, relations and functions and to Read, understand and Construct mathematical arguments.
- To understand Recurrence Relation, Generating functions and Algebraic Systems and Boolean algebra

UNIT 1 : MATHEMATICAL LOGIC 11

Statements, Connectives, Truth tables, Normal forms DNF and CNF ,PCNF and PDNF, Validity using truth tables, Inference theory of statement calculus- direct and indirect method, Inference theory of statement calculus using rule CP, Consistency and inconsistency, Predicates, Quantifiers, Inference Theory of predicate calculus.

UNIT 2: COUNTING PRINCIPLES **6**

Mathematical logic-Mathematical logic- problems- Pigeonhole Principle-Generalized Pigeonhole principle-Principle of inclusion and exclusion- Principle of inclusion and exclusion.

UNIT 3 : RECURRENCE RELATIONS **11**

Recurrence relation-Recurrence relation from solution-Solution of Homogeneous Recurrence relation-Solution of Non- Homogeneous recurrence relation-Solution of Non- Homogeneous recurrence relation-Generating functions-Solution of Recurrence relations using generating functions-recursive functions-Primitive recursive functions-Computable recursive functions, Non –Computable recursive functions

UNIT 4 : ALGEBRAIC SYSTEMS **9**

Groups, Cyclic groups-Permutation groups-Properties of Groups-Subgroups, omomorphism, Isomorphism-Properties of homomorphism-Cosets, Lagrange's Theorem-Normal subgroups, factor groups-Fundamental Theorem-Cayley's theorem

UNIT 5: BOOLEAN ALGEBRA **8**

-Relation. Properties-Equivalence relations, Partial orderings-Poset- Lattice-Hasse diagram-Boolean algebra-Properties of Boolean algebra-Problems in Boolean algebra

Text Books:

1. Tremblay J.P. and Manohar R. - **Discrete Mathematical Structures with applications to Computer Science** - Tata Mc Graw Hill Edition, 2001
2. Prof.V.Sundaresan, K.S.Ganapathy Subramanian and K.Ganesan - **Discrete Mathematics** - New revised edition, 2002

References:

1. Alan Doerr and Kenneth Levasseur - **Applied Discrete Structures for Computer Science** - Galgotia publications, 1992
2. Kenneth H Rosen - **Discrete Mathematics and its applications** - Tata McGraw Hill,7th edition, 2011.
3. C.L.Liu - **Elements of Discrete Mathematics** - 2nd edition, McGraw Hill Publications, 2002

Course Code	Course Title	L	T	P	C
MC13E01	MANAGEMENT INFORMATION SYSTEM	3	0	0	3

Course Rationale:

- To gain knowledge on the fundamentals of digital systems to the students.
- To provide a complete, comprehensive coverage of various management information system.
- To develop techniques of various management information systems.
- To enable the learner to aim for career opportunities in various **ERP implementations, ERP-support and MIS development.**

Course Objectives:

At the end of this course the learner is expected :

- To understand various MIS applications like Finance, Marketing, Material management etc.,
- To know about Database and User interface for various MIS applications
- To design an organization forms
- To understand office automation techniques
- To appreciate the applications of Information Communication Technology(ICT) in Computer applications

UNIT – 1: SYSTEM CONCEPTS & STRUCTURE OF MIS **8**

Introduction to MIS& MIS as an evolving concept- MIS and other academic disciplines - Subsystems of MIS - Role of MIS Professional - Operating Elements of an Information System - MIS structure based on organizational function- I - MIS structure based on organizational function- II - Synthesis and Some Issues of MIS Structure

UNIT – 2: SURVEY OF INFORMATION SYSTEMS TECHNOLOGY 8

Computer Hardware & data Representation - Classes of Computers and their languages Communication Facilities and Networks - Wide Area Network and Distributed Systems Physical & Logical Models of Data - File & Datebase Organizations - Transaction Processing Cycle - Message & Document Communication, Information Processing Control

UNIT – 3: CONCEPTUAL FOUNDATIONS &SYSTEM SUPPORT 11

Phases in decision Making Process - Methods Of decision making process - Documenting and communicating decision rules - The Basic model of Organizational structure, power & change - Organization Structure Implications for Information System Design - Decision Support systems and Expert Systems - Approaches to develop decision support systems Knowledge work and different types- Technology in support of knowledge work -Software support facilities for knowledge work - User developed systems and impact of technology

UNIT-4: INFORMATION SYSTEM REQUIREMENTS 9

Planning for information systems - Three stage model of planning process - Analysis of organizational information requirements - Three levels of information requirements and constraints - A strategy approach to determine information requirements - Database Requirements- Data model concepts and terminology- Approaches in determining Data Requirements- User Interface Requirements and Interactive User Dialogue -Alternate interaction mechanisms

UNIT-5: DEVELOPMENT, IMPLEMENTATION AND MANAGEMENT OF INFORMATION SYSTEM RESOURCES 9

Prototyping approach to application development - Life cycle approach to application development - Project Management and Implementation of Information Systems - Organizational functions for control and quality assurance- Quality assurance with user developed systems and post audit evaluation - Organization of information resources functions - Organization and management of end user computing - Merger of Computers and Communications Technology - Impact of information technology on organizations and society

Text Books:

1. Gordon B.Davis and Margrethe H. Olson. – **Management Information Systems Conceptual Foundations, Structure and Development** – Tata McGraw Hill International Book Company, 2008.
2. Kenneth C.Laudon and Jane P.Laudon - **Management Information Systems-Managing the Digital Firm -** Pearson Education Asia - 2013.

References:

1. Waman S Jawadekar – **Management Information Systems** – Tata McGraw Hill Education Private Limited, 2009.
2. Lucey T.- **Management Information System** – Continuum – 2001

Course Code	Course Title	L	T	P	C
MC13E02	COMPUTER ORIENTED STATISTICAL METHODS	3	0	0	3

Course Rationale :

- To offer sound knowledge on statistical tools
- To compute the relevant statistical measures for different types of data
- To identify the relationship between variables
- To analyze the statistical data based on experiments
- To aim for careers in data analysis / statistical analysis

Course Objectives:

At the end of this course the learner is expected :

- To apply statistical distributions for real life problems
- To compute simple correlation, Partial correlation and Multiple correlation
- To form Regression equations and to construct Multiple Regression models
- To analyze the Statistical data by using statistical tests (based on small sample and large sample)
- To draw valid inferences based on the analysis of statistical data

UNIT – 1: BASICS OF PROBABILITY THEORY **7**

Random Experiments, Events and their classification - Addition and Multiplication Theorem - Bayes Theorem - **Tutorial Topic: -** Basics of Probability - Random Variable - Probability Mass function & Probability Density function - (PMF &PDF) - Exercises in PMF & PDF

UNIT – 2: STATISTICAL DISTRIBUTION **7**

Mathematical Expectation Addition Theory - Multiplication Theorem - Binomial Distribution Poisson Distribution - Normal Distribution - Exponential Distribution - Comparison of Distributions

UNIT – 3: CORRELATION REGRESSION 9

Correlation Coefficient - Computation of Coefficient - Partial Correlation - Multiple Correlation - Linear Regression - Formation of Regression lines - Properties of regression Multiple Regression equation - Exercises in Regression analysis

UNIT – 4: SAMPLING THEORY – LARGE SAMPLE TESTS 11

Simple Random Sampling - Stratified Random sampling & System Sampling - Sampling Distribution & Standard Error - Test of Significance - Tests of sampling II Large Sample Test - I - Large Sample Test – II - Chi-square distribution - Exercises in Large sample test I - Exercises in Large sample test II - Applications of Chi-square distribution

UNIT –5: SMALL SAMPLE TESTS AND DESIGN OF EXPERIMENTS 11

Student's - t-test - Paired t-test - F-distribution & Basics of Analysis of Variance - ANOVA Table - Basics of Design of Experiments - Completely Randomize Design (CRD) Randomize Block Design (RBD) - Latin Square Design (LSD) - Comparison of CRD, RBD & LSD - Exercises in CRD and RBD - Exercises in LSD

Text Books:

1. S.C.Guptha and V.K.Kapoor - **Fundamentals of Mathematical Statistics** - Sultan Chand & Sons. New Delhi - 2003.
2. S.C.Guptha and V.K.Kapoor: - **Fundamentals of Applied Statistics** - Sultan Chand & Sons. New Delhi - 2003.

References:

1. Medhi A. - **Statistical Methods: An Introductory Text** – Wiley Eastern Limited, New Delhi – 1993.

Course Code	Course Title	L	T	P	C
MC13E03	ORGANIZATIONAL BEHAVIOR	3	0	0	3

Course Rationale:

- To design and implement an individual and group behavior in organizational context.
- To understand the overall structure of any organization in particular to IT industry.
- To enable the learner for aspiring careers with different IT companies.

Course Objectives:

At the end of this course the learner is expected :

- To earn the Various Organizational concepts
- To evaluate the Individual and group behavior of an organizational setting
- To describe the Leadership qualities
- To understand the Organizational structure and culture.

UNIT – 1 : INTRODUCTION **9**

Nature of OB-Definition of OB-Contributing Disciplines of OB-Approaches to the study of OB-Challenges and opportunities for OB- Historical evolution of OB-Hawthorne studies-Foundations of individual behavior-Personal factors-Environmental factors-Organizational system and Resources.

UNIT – 2: PERSONALITY AND MOTIVATION **9**

Nature and Theory of personality,Shaping of personality - Determinants of personality- Personality Traits-Perception-Perceptual process-Meaning and definition of learning-Principles of learning-Nature of motivation-Theories of motivation-Process theories.

UNIT – 3: JOB SATISFACTION AND GROUP BEHAVIOR **9**

Nature and components of attitudes-Formation and Functions of attitudes-Changing attitudes-Values-Job satisfaction-Nature and Types of Groups-Group development-Group structuring-Small groups in organization

UNIT – 4: LEADERSHIP AND POWER AND POLITICS **9**

Nature of leadership - Leadership and management-Theories and leadership-Power-Politics-Meaning and definition of work stress-Work stress model-Burnout-Stress management.

UNIT- 5: ORGANIZATIONAL STRUCTURE AND DESIGN **9**

Organizational structure-Key factors of organizational design-Types of organizational design-Meaning and definition of organization Culture-Culture dimension and effects-Organizational change-Organizational development

Text Books:

1. K.Aswathappa - **Organizational Behavior -** Himalaya Publishing House- Fifth Edition – 2002. (Chapter 1, 2, 4, 5-14, 17, 18, 20, 21)

References:

1. Stephen Robbins- **Organizational Behavior -** Prentice Hall of India - 9th Edition - 2001.
2. Fred Luthans - **Organizational Behavior -** McGraw Hill - 1998.

Course Code	Course Title	L	T	P	C
MC1328	PERSONALITY DEVELOPMENT - I	2	0	0	2

Course Rationale:

- To inculcate reading habit and develop effective reading skills
- To improve basics of grammar
- To help students spot common errors in English
- To familiarize students with vocabulary and their application in context

Course Objectives:

At the end of this course the learner is expected :

- To read, understand and critically analyze passages
- To understand the semantic and syntactic formation of sentences

UNIT – 1 : READING SKILLS **6**

Reading Comprehension

UNIT – 2 : GRAMMAR **14**

Fundamentals of Grammar – Parts of Speech I - Fundamentals of Grammar – Parts of Speech II - Fundamentals of Grammar – Articles, Modifiers & Determiners - Fundamentals of Spotting ErrorsGrammar – Concord Rule - Fundamentals of Grammar – Tenses-Sentence Correction

UNIT – 3: VOCABULARY **4**

Synonyms – Antonyms

UNIT – 4: Usage of vocabulary & grammar in context **4**

Sentence Completion - Word Analogy

UNIT – 5: VERBAL LOGIC **2**

Critical Reasoning

Text Books:

1. A. J. Thomson & A.V. Martinet - **A Practical English Grammar -** Oxford University Press, USA, 4th edition, 1986.
2. Wren & Martin - **High School English Grammar and Composition -** Faber &Faber, First Canadian Edition, 1991.

References:

1. Barron's NEW GRE, 19th edition, Galgotia Publications Pvt. Ltd., New Delhi, 2012.
2. Barron's GMAT, 14th edition, Galgotia Publications Pvt. Ltd., New Delhi, 2012.
3. Cambridge Advanced Learner's Dictionary, 3rd Edition, Cambridge University Press, 2008.
4. **Word Power Made Easy** – Norman Lewis, Pocket Books, New York, 1949.
5. **Objective English** – Edgar Thorpe, 4th Edition, Pearson education, 2003.

Course Code	Course Title	L	T	P	C
MC1331	CLOUD COMPUTING TECHNOLOGIES	3	0	0	3

Course Rationale:

- To understand the need of cloud computing in the IT sector
- To know the cloud service providers and the kind of services offered by them
- To analyze the Benefits of cloud in business continuity by applying cloud services, security and virtualization features
- To enable the learner for aspiring careers in Cloud / Software Product development areas.

Course Objectives:

At the end of this course the learner is expected :

- To describe cloud computing architecture and services
- To identify cloud platforms and services
- To identify design issues of cloud computing
- To analyze the security factors of implementing cloud environment
- To understand the server virtualization and its implementation
- To review real time applications of cloud computing

UNIT 1: CLOUD BASICS **7**

Cloud computing , history- Pros and cons- Cloud architecture- Cloud architecture- Choice of cloud computing- Choice of cloud computing

UNIT 2: CLOUD SERVICES **10**

Various cloud services- Platform as a service- Platform as a service- Software as a service- Software as a service- Infrastructure as a service- Design of web application- Machine, privacy and data management- Other cloud services

UNIT 3: CLOUD SECURITY **9**

Cloud security- Infrastructure security- Data security and storage- Network security – I- Network security – II- Host security- Disaster recovery and management- Disaster recovery and management

UNIT 4: VIRTUALIZATION **9**

Virtualization objectives- Virtualization implementation-Virtual servers introduction-Xen server- Hyper V – I - Hyper V – II- VMWare – IVMWare – II

UNIT 5: CASE STUDY **10**

Amazon cloud services- Amazon EC2- Amazon S3- Google cloud services- Google Map reduce, GFS- Sales Force- Windows Azure- EMC cloud services- IBM cloud services- Apache Hadoop

Text Books:

1. George Reese - **Cloud Application Architectures: Building Applications and Infrastructures in the cloud -** O'Reilly Media Inc., 2009
2. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter - **Cloud Computing A practical Approach -** McGraw Hill, 2010

References:

1. Kenneth Hess, Amy NewMan - **Practical Virtualization Solutions -** Prentice Hall, 2010
2. Shahed Latif, Tim Mather, Subra Kumaraswamy - **Cloud Security and Privacy : An Enterprise perspective on risks and compliance -** O'Reilly Media Inc., 2009
3. Gautam Shroff - **Enterprise Cloud Computing: Technology, Architecture, Applications** - Cambridge University Press, 2010

Course Code	Course Title	L	T	P	C
MC1332	PROGRAMMING IN JAVA	3	0	3	4

Course Rationale:

- To understand the principles and concepts of object oriented programming
- To learn multithreading concepts
- To enable the learner to pursue careers in Java solution Architect / Java Programmer

Course Objectives:

At the end of this course the learner is expected:

- To Store and retrieve the information from Files.
- To Create various forms using awt controls , layout manager and perform events
- To Implements various application like banking, inventory, etc.

UNIT 1: INTRODUCTION TO JAVA **9**

The Genesis of Java- Buzzwords- Object oriented Concept- Lexica Issues- Data types and variables- Arrays- Operators- Control Statements Selection- Control Statement Iteration and jump Statement

UNIT 2: OBJECT ORIENTED CONCEPTS **9**

Introducing classes –method - Inheritance Basics-method Overriding - abstract classes-String Operations-character extraction - String comparison-searching string-Modifying String- String Buffer-String Buffer methods Added by java2

UNIT 3: PACKAGES INTERFACE EXCEPTION HANDLING AND MULTITHREADING **9**

Packages-Interfaces-Exception handling-Java thread model -creating thread-Thread priorities-synchronization-Inter-communication-Deadlock

UNIT 4: APPLET, AWT AND EVENT HANDLING **9**

Applet Basics-Applet architecture-HTML APPLET tag-Passing parameter to Applet-getDocumentBase() and getCodeBase()-AWT classes and Graphics-AWT Controls-Event Handling-Event Classes-Event Listener Interfaces-Layout Managers-Menus

UNIT 5: COLLECTION FRAMEWORK& FILES **9**

Collection interface- Collection classes -Iterator and comparator-/O Basics-Reading -Console input-Writing Console output-Reading and Writing Files-Files-Stream Classes-Byte stream classes-Character Stream Classes

Text Books:

1. Naughton and H.Schildt - **Java 2-The complete reference** – McGraw Hill – Fifth Edition.- 2007.
2. S.Horstmann, Gary Cornell - **Core Java 2 Volume I - Fundamentals** - Addison Wesley.-2001

References:

1. Arnold and J.Gosling - **The java programming language** – Addision Wesley - Second edition – 2000.
2. Art Gittleman - **Ultimate Java Programming** - Wiley Publications – 2002.
3. Herbert Schildt – **Java The Complete Reference** – 8th Edition – 2011.

Course Code	Course Title	L	T	P	C
MC1333	PROGRAMMING IN C#	3	0	3	4

Course Rationale:

- To cover the fundamental concepts of the C# language.
- To understand the basis of web programming.
- To learn various C# libraries.
- To enable the learner to become an application developer using this language

Course Objectives:

At the end of this course the learner is expected:

- To gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the framework.

- To improve programming skills in C# both in basic and advanced levels.
- To develop windows applications and be ready for medium and large-scale projects.
- To design web applications in .Net framework.

UNIT 1: C# LANGUAGE FUNDAMENTALS 8

An Overview of C# - Data Types – Literals – Variables - The Scope and Lifetime of variables - Type Conversion and Casting - Type Conversion in expressions – Operators -
Program Control Statements - if and switch Statements - for, while, do-while and foreach loop - Using break - continue and goto Statements

UNIT 2: OBJECT-ORIENTED CONCEPTS IN C# 9

Class Fundamentals - Creating objects - Reference variables and assignment and methods Constructors - the new operator – Destructors - the this keyword – Arrays - One dimensional array - Multidimensional arrays - Jagged arrays - Assigning array references - Using the length property - Implicitly typed arrays - foreach loop – Strings - Controlling access to class members - Passing references to methods - Use ref and out parameters - Use a variable number of arguments - Return objects - Method Overloading - Overload Constructors - Object initializes The Main() method – Recursion - understanding static - Static classes -Operator Overloading - Indexers and Properties

UNIT 3: ADVANCED C# 10

Inheritance Basis - Member access and inheritance - Constructors and inheritance - inheritance and name hiding - Creating a multilevel hierarchy - Base class references and derived objects - Virtual methods and Overriding - Using Abstract classes - Using sealed to prevent Inheritance - The Object class – Interfaces - Using Interface references - Interface properties - Interface indexers - Interface can be inherited - Name hiding with interface inheritance - Explicit implementations - Choosing between an interface and an abstract class -The .NET Standard Interfaces - Structures and Enumerations - Exception Handling - Using I/O - The Stream Classes - Console I/O - FileStream and Byte-Oriented File I/O - Character-Based File I/O - Redirecting the Standard Streams - Reading and Writing Binary data - Random Access Files - Using MemoryStream - Using StringReader and StringWriter - Converting numeric strings to their internal representation

UNIT 4: C# AND THE .NET FRAMEWORK 9

Delegates - Anonymous Functions - Anonymous methods - Lambda Expressions – Events Use anonymous methods and Lambda Expressions with Events – Namespaces - The Preprocessors - Assemblies and the internal access modifier - Runtime Type Identification Reflection - Using Reflection – Attributes - Built-in Attributes

UNIT 5: WINDOWS PROGRAMMING 9

Programming with Basic Windows Form Controls: Controls- Button control - Label and Linklabel controls - Textbox control - Radiobutton and Checkbox controls - Richtextbox control - Listbox and Checkedlistbox control - Listview control - Tabcontrol control - Advanced Windows Form Features: Menus and Toolbars - SDI and MDI applications -Building MDI applications - Creating Controls

Text Books:

1. Herbert Schildt – **C# 3.0 : The Complete Reference** - McGraw-Hill – 2009
2. Karli Watson, Christian Nagel, Jacob Hammer Pedersen, Jon Reid, Morgan Skinner – **Beginning Visual C# 2010** – Wrox Programmer to Programmer – Wiley Publishing, Inc. – 2010

References:

1. Paul Deitel, Harvey Deitel – **C# 2010 For Programmers, Deitel Developer Series** – Pearson Education – 2011
2. Andrew Troelsen – **C# and the .NET Platform** – A! Press – 2003

Course Code	Course Title	L	T	P	C
MC1334	DATA BASE ADMINISTRATION	3	0	3	4

Course Rationale:

- To provide a reliable, consistent, secure, and available corporate-wide data.
- To distinguish database administration and data administration

- To introduce several database operation and maintenance issues.
- To enable the learner to become a Data Base Administrator.

Course Objectives:

At the end of this course the learner is expected:

- To familiarize basics of Database Architecture.
- To manage the Database Objects and its Users.
- To understand Backup and Recovery Concepts related to databases.

UNIT 1: BASICS OF THE ORACLE DATABASE ARCHITECTURE 9

Oracle Server Architecture - Connect Users to Servers and Processing queries, changes and commits - Oracle Universal Installer - Setting up OS and Password File Authentication Oracle Enterprise Manager Components - Creating Parameter File - Starting and Shutting an Instance - Opening and Closing a Database - Getting and Setting Parameter Values -Managing Sessions - Monitoring ALERT and Trace Files - Creating an Oracle Database

UNIT 2: MANAGING THE PHYSICAL DATABASE STRUCTURE 9

Managing Control Files - Maintaining Redo Log Files – Planning - Troubleshooting and Archive Redo Log Files - Logical Structure of the Database - Creating and Changing Tablespace - Temporary Segments - Changing and Relocating Tablespaces - Storage Structures and Relationships - Obtaining Storage Structures Information

UNIT 3: MANAGING DATABASE OBJECTS 11

Planning and Creating Rollback Segments - Maintaining Rollback Segments - Managing Tables - Oracle Datatypes Creating and Controlling Tables - Analyzing and Retrieving Information about Tables - Creating Different Indexes - Reorganizing Indexes - Dropping Indexes of database directory - Integrity Constraints and Triggers - Implementing Integrity Constraints and Triggers - Maintaining Integrity Constraints and Triggers

UNIT 4: MANAGING DATABASE USE 7

Creating Database Users - Altering and Monitoring Existing Users - Administering Profiles - Controlling Resource Use and Administering Passwords - System Privileges - Object Privileges - Granting and Revoking Privileges - Controlling OS and Auditing

UNIT 5: OVERVIEW OF BACKUP AND RECOVERY 9

Backup Considerations – Recovery Considerations - Components for Backup and Recovery - Redo Logs - Checkpoints and Achieves - Multiplexing Control Files & Redo Logs - Types of Failures - Configuring Redo Log Archiving - Multiplexing and Archiving Redo Log Files - Recovery Implications and Performing Offline, Online Backups

Text Books:

1. Jason Couchman and Ulrike Schwinn - **DBA Certification Exam Guide -** Osborne/McGraw-Hill, 2001.
2. Craig S.Mullins – **Database Administration: The Complete Guide to DBA Practices and Procedures** – Addison Wesley – 2nd Edition – 2002.

References:

1. Pablo Berzukov – **Understanding Database Administration** – Createspace – 2010.
2. Donald K.Burleson – **Oracle Tuning The Definitive Reference** – 2nd Edition – Rampant TechPress – 2006.
3. Kevin Loney – **Oracle Database 11G: The Complete Reference** – McGraw Hill - 2008

Course Code	Course Title	L	T	P	C
MC1335	LINUX SYSTEM ADMINISTRATION	3	0	3	4

Course Rationale:

- To enhance the programming skills on Linux Scripting
- To impart knowledge on the ways to customize, administer and secure Linux systems
- To provide the knowledge on configuring internet and intranet services in Linux system.

- To enable the learner for aspiring careers in System Administration related areas.

Course Objectives:

At the end of this course the learner is expected:

- To understand the use of Linux commands and know the concepts of Shell programming
- To administrate the Linux System and configure various services in Linux
- To customize and secure the Linux system

UNIT 1: SHELL BASICS **9**

Files and Directories - File Name substitution - I/O Redirection – Pipes - Std Error - More on commands - Kernel utilities - Login Shell - Shell Responsibilities - Regular Expressions - Filtering Commands - Shell Variables - Single quote - Double Quote -Back Quote - Backslash

UNIT 2: SHELL PROGRAMMING **10**

Special Shell Variables – Arguments - Shift command - Programs using arguments - Exit status - test command - if-then-else – Elif - case structure - null command - && and || construct - Programs using decision statements - For loop, while loop, until loop - More on loops - Programs using loops - Read command - Printf command

UNIT 3: INSTALLING LINUX AND SINGLE HOST ADMINISTRATION **8**

Server design - dual boot - methods of installation - Installing Linux – RPM - Managing software using RPM - Compile and Install GNU software - Users and user information - users and access permissions - User management tools - Boot loaders - Init process - Enabling and disabling services.

UNIT 4: FILE SYSTEMS AND NETWORKING **8**

Managing file system - Adding a new disk - Logical volume management - Modules and network interfaces - Managing routes - Netfilter functions - Installing Netfilter - Configuring Netfilter.

UNIT 5: SERVER CONFIGURATIONS **10**

Understanding DNS - Installing and Configuring DNS - DNS Records - DNS Tool box - DNS Clients - Mechanics of FTP - Installing FTP - Understanding HTTP - Installing and Configuring HTTP - Mechanics of NFS - Configuring NFS - Inside NIS - NIS Configuration - NIS Tools

Text Books:

1. Stephen G. Kochan, Patrick Wood – **Unix Shell Programming -** Pearson Education – Third Edition – 2003.
2. Steve Shah, Wale Soyinka – **Linux Administration – A beginners Guide** – TataMcGraw-Hill – Fourth Edition – 2005

References :

1. Behrouz A.Forouzan, Richard F. Gilberg – **Unix and Shell Programming** – PWS Publishers – 2003.
2. Vicki Stanfield, Roderick W.Smith – **Linux system Administration** – Sybex Inc. – Second Edition – 2001.
3. Christopher Negus – **Redhat Linux 9 Bible** – Willey Publishing Inc – 2003.

Course Code	Course Title	L	T	P	C
MC13E04	TCP/IP NETWORKS	3	0	0	3

Course Rationale:

- To impart knowledge about TCP/IP and current trends with network layer protocols
- To learn about UDP versus TCP in data communication
- To become a network engineer
- To become a network administrator
- To enable the learner for aiming careers in Software Product Development and Software Research

Course Objectives:

At the end of this course on the learner is expected:

- To acquire basic knowledge about TCP/IP
- To gather extensive knowledge about various version of Internet protocol
- To learn about TCP/IP package and supporting protocols
- To know about the connection establishment and connection release of TCP/IP

UNIT 1: INTRODUCTION **9**

TCP/IP protocol suite - TCP/IP versions - IP addressing : Classful addressing - Sub netting and super netting - Class less addressing - Various length blocks - sub netting - Address allocation

UNIT 2: INTRODUCTION NETWORK LAYER PROTOCOLS **9**

ARP package - Internet Protocol - IP package - Internet Control Message Protocol - ICMP package - ICMP Package - ICMP messages - Internet Group Management Protocol - IGMP Package

UNIT 3: USER DATAGRAM PROTOCOL **9**

Introduction - Process to Process communication - Port and socket addressing – UDP – Checksum - UDP operation - Uses of UDP - UDP package introduction - UDP modules

UNIT 4: UNICAST ROUTING PROTOCOL **9**

Distance vector Routing - Routing Information Protocol - Link State Open Shortest Path First Protocol Routing - Path Vector Routing and Border Gate way protocol - Multicast routing protocols : MOSPF, DVMRP ,CBT , PIM , MBONE, DHCP, BOOTP

UNIT 5: DOMAIN NAME SYSTEM **9**

Name space - Types of DNS - DNS messages - Types of records - FTP introduction - FTP file transfer – TFTP - Connection establishment - Data transfer - TELNET

Text Books:

1. Behrouz A.Forouzan **– TCP/IP Protocol Suite** – McGraw Hill – Third edition – 2002. (Chapters : 2.3,2.4,2.5,4,5,6,7,8,9,10,11,12,15,17,18,20,26,28).

2. Richard Stevens W - **TCP/IP Illustrated Vol.I Version 3** – Addison Wesley Publications – 2000.

References:

1. Douglas Comer – **Internet Working with TCP/IP –Vol.1** – Prentice Hall of India Pvt. Ltd. – 2000.

Course Code	Course Title	L	T	P	C
MC13E05	ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS	3	0	0	3

Course Rationale:

- To impart knowledge on Artificial Knowledge concepts
- To learn all searching algorithms and Hill-climbing procedures
- To improve their gaming skills and learn about Expert system
- To enable the learners for aspiring careers in the field of Artificial Intelligence.

Course Objectives:

At the end of this course on the learner is expected :

- To Describe the basic concepts of Artificial Intelligence and Expert system
- To apply algorithms for best searching methods.
- To write predicate logic for statements.
- To develop filler -structures for meaningful statements.
- To develop the gaming logics.
- To Understand the need of an Expert system

UNIT 1: INTRODUCTION TO AI & AI TECHNIQUES **9**

Introduction to types of knowledge - Ai Techniques and Production system - Control strategies - Breadth-First Algorithm - Depth-First Algorithm - Heuristic Search - Problem characteristics and production system characteristics - Best-first Search Discussion

UNIT 2: PREDICATE LOGIC **11**

Knowledge Representations – Mappings - Approaches to knowledge representations – simple and Inheritable - Approaches to knowledge representations –Inferential & Procedural knowledge - Predicate logics – symbols and rules - Sample examples on predicates logics - Representing simple facts in logic - Representing knowledge using rules – PROLOG - Forward and Backward reasoning - Truth Maintenance System - Statistical reasoning - Bayesian Networks

UNIT 3: WEAK – AND – STRONG SLOT FILLER STRUCTURES **11**

Weak – slot – filler structure - Semantic nets – intersection search - Making some important distinctions on semantic nets - Partitioned semantic net - Partitioned semantic net - Creating Frames - Strong-slot-filler structures – conceptual dependencies - Actions and Rules – CD - Scripts introduction and components - Creating a sample script for RESTAURANT - CYC & CYCL

UNIT 4: GAMING **8**

Game playing techniques - Iterative deepening - Algorithm – Depth first iterative deepening - How to plan a system - Hierarchical planning - Reactive systems – Understanding - Discussion on planning and understanding

UNIT 5: EXPERT SYSTEM **6**

Types of learning - General learning models - Expert system components and descriptions - Expert system shells - Types Explanation - Knowledge Acquisition - issues

Text Books:

1. Rich Elaine Knight Kevin – **Artificial Intelligence** – TataMcGraw Hill – 1993

References:

1. Patterson W Dan – **Introduction to Artificial Intelligence and Expert system** – Prentice Hall of india – 1990.
2. David W Rolston – **Principles of Artificial Intelligence and Expert system Development** – McGraw Hill International Edition – 1998.

Course Code	Course Title	L	T	P	C
MC13E06	ADHOC NETWORKS	3	0	0	3

Course Rationale:

- To impart knowledge about wireless networks, wireless applications and current trends with wireless nodes
- To learn about the adaptation of routing protocols with ad hoc networking
- To become a network engineer
- To enable the learner for aiming careers in System / Network administration

Course Objectives:

At the end of this course the learner is expected:

- To acquire basic knowledge about wireless networking
- To gather extensive knowledge about wireless communication with mobile nodes
- To learn about network formation of Ad hoc nodes
- To know about the role of various wireless routing protocols

UNIT 1: INTRODUCTION **9**

Mode of operation: Symmetric links,Layer-2 Ad hoc solutions, Proactive versus reactive protocols, Multicast - Commercial applications of Ad hoc networking: Conferencing, Home networking, Emergency services, Personal Area Network and blue tooth - Commercial applications of Ad hoc networking: Embedded Computing Applications, Sensor Dust, Automotive Interaction - Technical and Market factors affecting ad hoc networking: Scalability, Power budget versus Latency, Protocol deployment and Incompatible standards, Wireless data rates - User education and acculturation - Market applications - Additional security exposure - Spotty coverage

UNIT 2: CLUSTER BASED NETWORKS **9**

Cluster for transmission management: Link cluster architecture - Cluster for backbone permission: Near –term digital radio network - Virtual subnet architecture - Cluster for routing efficiency: Hierarchical routing, Hierarchical routing - Hierarchical routing algorithm - Ad hoc routing protocol overview - Link state routing – clustering

UNIT 3: DYNAMIC SOURCE ROUTING **9**

Introduction: Overview and properties - DSR protocol description: DSR route discovery - DSR route maintenance - Additional route discovery features - Additional route maintenance feature - Support for heterogeneous network s and mobile IP - Case study - Multicast routing with DSR, Location of DSR function - DSR evaluation

UNIT 4: AODV **9**

Introduction – Properties - Unicast route establishment - Multicast route establishment – Broadcast – Simulation - Parameters discussion - Optimization and enhancements – Security

UNIT 5: ZRP **9**

Introduction - ZRP formal description - Link reversal routing - Gafni – Bertsekas algorithm Discussion - Light weight mobile algorithm - Implementation of Gafni - Temporarily ordered routing algorithm - Comparism of LRR algorithm

Text Books:

1. Charles E. Perkins-**Ad Hoc Networking -** Addison Wesley – 2nd Edition–2004. (Chapters 1, 4, 5, 6 & 7)

References:

1. Sivaram Murthy - **Ad Hoc Network Architecture -** Addison Wesley – 2nd Edition – 2004.

Course Code	Course Title	L	T	P	C
MC13E07	GRID COMPUTING	3	0	0	3

Course Rationale:

- To understand the genesis of grid computing
- To know the application of grid computing
- To understand the technology and tool kits for facilitating grid computing
- To enable the learner for aspiring careers in Software Research and R&D sections of different IT companies.

Course Objectives:

At the end of this course the learner is expected:

- To Understand the basics of Distributed computing
- To Obtain awareness in the areas of applications of grid computing
- To Understand the technology and tool kits for implementing grid computing system
- To Increase the awareness on the research areas in Grid computing Technology

UNIT 1: INTRODUCTION AND OVERVIEW OF GRID COMPUTING **9**

How did Early Grid Activities being carried? - How does Current Grid Activities being carried - An Overview of Grid Business Areas - Grid Business areas Analysis - Grid Applications-Single Sign-on, Resource Broker - Introduction on Virtualization Concept with Grid Applications – Grid Infrastructure-Middleware Layer, Application Layer - Over view of Grid Infrastructure - Real time Grid Applications-Discussion

UNIT 2 : WEB SERVICES AND RELATED TECHNOLOGIES **9**

About Service Oriented Architecture - Web Service Architecture Diagrammatic Demonstration - XML, Related Technologies - Related Technology Relevance to Web services - XML Messages and Enveloping services - Service Message Description Mechanisms – Relationship between Web Service and Grid Service – Web Service Interoperability functions - The Role of the WS-I Organization

UNIT 3: OPEN GRID SERVICES INFRASTRUCTURE 9

Introduction to Grid Services - A High-Level Introduction to OGSI – Overview of Open Grid Services Infrastructure Layered Architecture - Detailed Open Grid Services Infrastructure Layered Architecture - Introduction to Service Data Concepts - Detail description on service Data Concepts – Grid Service: Naming and Change Management Recommendation - Other OGSI services - Pitfalls in OGSI

UNIT 4: OGSA BASIC SERVICES AND THE GRID COMPUTING TOOLKITS 9

What is Common management Model? - Specification of Common Management Model(CMM) - Necessity of Common Management Model - Security Architecture diagrammatic demonstration - Types of Security Architectures for Grid system - GLOBUS GT3 Toolkit: Architecture- Overview - Programming model of CMM - The representation of CMM in Globus Toolkit - High level services of Globus Toolkit

UNIT 5: GRID COMPUTING SECURITY 9

What is Grid Security - Levels of Grid Security system - Grid Information security Architecture - Grid Credential Management System - Advantage, Disadvantages of Credential management system - Need for Trust Management - Overview of Trust Management in Grid - Specific Trust Management system in Grid - Comparing Grid security architecture with other distributed security architectures

Text Books:

1. Joshy Joseph & Craig Fellenstein, - **Grid Computing -** Pearson/PHI PTR-2003
2. AnirbanChakrabarti - **Grid Computing Security** - Springer – 2007.

References:

1. Ahmar Abbas - **Grid Computing: A Practical Guide to technology and Applications** - Charles River media – 2003.

Course Code	Course Title	L	T	P	C
MC13E08	E-COMMERCE AND M-COMMERCE	3	0	0	3

Course Rationale:

- To impart knowledge on E-Commerce, Various applications connected with E-Commerce and M-Commerce and legal issues of e-commerce.
- To enable the learner for aiming careers in special software development involving E-Commerce and M-Commerce technologies.

Course Objectives:

At the end of this course the learner is expected:

- To understand about Business of internet
- To work on Network security
- To appreciate EDI & E-Payment
- To understand challenges of the internet business, Customer care and Billing
- To know about the future and economics of M-Commerce

UNIT 1: INTRODUCTION TO E-COMMERCE, BUSINESS OF INTERNET, N/W SECURITY & FIREWALLS: 10

E-commerce framework, media convergence - Anatomy of e-commerce applications - e-com consumer, organization applications - Telco/Cable/Online Companies, National Independent ISPs, Regional-level ISPs - Local level ISPs - Service provide abroad, connectivity: N/W interconnection points - Internet connectivity options, logistics of being an ISP - Client-server network security, emerging threats, firewalls and network security - data and message security, Challenge response systems- Encrypted documents and e-mail - U.S Government regulations and encryption

UNIT 2: E-COMMERCE &WWW, CONSUMER ORIENTED E-COM, E-PAYMENT SYSTEM: 10

Architectural framework for e-com, WWW as the architecture - Web background: Hypertext publishing, technology behind the web - Security and the web - Consumer oriented applications - Mercantile process models – from the consumer's perspective - Types of e-payment system, digital token based e-payment systems - Smart card and e-payment system -Credit card e - payment system-Credit card e - payment system - Risk and e-payment system, Designing e-payment system

UNIT 3: INTER ORGANIZATIONAL COMMERCE & EDI, EDI IMPLEMENTATION, ADVERTISING AND MARKETING ON THE INTERNET 8

EDI,EDI application in business - EDI: Legal, Security and privacy issues - EDI and E-commerce - Standardization and EDI - EDI software implementation - EDI envelope for message transport, VAN - Internet based EDI - The new age of information based marketing, Advertising on the internet - Charting the online marketing process, Market research

UNIT 4: CHALLENGES OF THE INTERNET BUSINESS- BUSINESS AND TECHNOLOGY, M-COMMERCE 8

Challenges of the internet business - Business and technology - Positive and negative effects of the internet - Value chain - Planning and execution - M-commerce-what is m-commerce? - Mobility and m-commerce - Location information: Asset

UNIT 5: CUSTOMER CARE, BILLING AND REVENUE ASSURANCE, THE INTERNET BUSINESS MODEL: THE FUTURE AND ITS ECONOMICS 9

Mobility & customer care - Billing and revenue assurance – OSS - The internet business model: Future and its economics - Public right and regulation - Internet Based model – OP - The next generation internet: Mobile Internet - The Next Generation Internet: Economics

Text Books:

1. Kalakota & Whinston **- Frontiers of Electronic Commerce** – Addison Wesley, 1996. (Chapters: 1, 4, 5, 6, 7, 8, 9, 10, 13)
2. Louis(P J) - **M-Commerce Crash Course: The Technology And Business Of Next generation,** 2001 (Chapters: 3,6,7,8)

References:

1. Henry chan, Raymond Lee, Tharam Dillon, Elizabeth Change- **E-Commerce Fundamental and Applications** –John Wiley & Sons Ltd.,-2001
2. David Whiteley **- E- Commerce, Strategy, Technologies and Applications** – Tata McGraw hill-2000
3. U.S.Pandey, Rahul Srivastava, Saurabh Shukla - **E-Commerce and its Applications** - - S.Chand & Co-2007

Course Code	Course Title	L	T	P	C
MC13E09	IMAGE PROCESSING	3	0	0	3

Course Rationale:

- To impart knowledge about image processing techniques
- To know about how image is enhanced, compressed and stored.
- To become an expert on Image processing and carryout research on image processing.
- To enable the learner for aspiring careers in biomedical related areas.

Course Objectives:

At the end of the course the learner is expected :

- To know about image fundamentals and mathematical transforms necessary for image processing.
- To gather knowledge about image enhancement techniques
- To know about **image restoration** procedures.
- To learn the image compression procedures.
- To study the image segmentation and representation techniques.

UNIT 1: DIGITAL IMAGE FUNDAMENTALS 9

Overview of image processing systems-Image formation-Perception-Elements of visual perception - Elements of visual perception- Continuous and digital image representation- Applications of digital image processing.

UNIT 2 : TRANSFORMATIONS 8

Basic geometric transformations-Introduction to Fourier Transform-Fourier Transform-Properties of 2D Fourier Transform-Discrete Cosine Transform- Loewe transforms.

UNIT 3: IMAGE ENHANCEMENT 10

Spatial **Domain** methods-Basic grey level transformation-Histogram equalization-
Image subtraction – Image averaging-Spatial filtering: Smoothing, sharpening filters-
Laplacian filters-Frequency domain filters : Smoothing-Sharpening **filters**-Homomorphic filtering.

UNIT 4: IMAGE COMPRESSION 9

Lossless compression: Variable length coding-LZW coding-Bit plane coding-predictive coding-DPCM-Lossy Compression: Transform coding-Wavelet **coding**-Basics of Image compression standards-JPEG standards-MPEG standards.

UNIT 5: IMAGE SEGMENTATION & REPRESENTATION 9

Edge detection – Thresholding-Region Based segmentation-Boundary representation: chair codes-Polygonal approximation- Boundary descriptors: segments- Simple descriptors Fourier descriptors – I - Fourier descriptors – II - Regional descriptors

Text Books:

1. Rafael C Gonzalez, Richard E Woods 2nd Edition - **Digital Image Processing** – Pearson Education - 2003.
2. William K Pratt - **Digital Image Processing** - John Willey – 2001.

References:

1. Anil K. Jain - **Fundamentals of Digital image Processing -** 2nd Edition, Prentice Hall of India - 1994.

Course Code	Course Title	L	T	P	C
MC13E10	PARALLEL COMPUTING	3	0	0	3

Course Rationale:

- To provide a basic knowledge of parallel computing, parallel paradigms and programming models.
- To concentrate on algorithms, programming and software engineering issues associated with the development of parallel applications.
- To enable the learner to aim for careers in Software Engineering related fields.

Course Objectives:

At the end of this course on the learner is expected :

- To gain the knowledge about parallel computing, parallel computer models and parallel programming models.
- To get in depth knowledge about Shard memory programming and Message passing paradigms.
- To learn principles of parallel virtual machines.

UNIT 1: SCALABLE COMPUTER PLATFORMS &MODELS 9

Evolution of computer architecture -Dimensions of scalability-Parallel Computer models-Basic Concepts of Clustering -Scalable design principles.

UNIT 2: BASIC OF PARALLEL PROGRAMMING 9

Parallel Programming Overview - Processes -Tasks &Thread-Parallelism issues- Interaction issues-Communication issues- Semantic issues .

UNIT 3 ENABLING TECHNOLOGIES 9

System development Trends -Principles of processor design-Microprocessor architecture families-Hierarchical memory technology -Cache coherence protocols -Shared memory consistency -Distributed cache /memory architecture .

UNIT 4 SYSTEM INTERCONNECTS 9

Basic of interconnection network -Network topologies and properties buses - Crossbar switches – I - Crossbar switches – II - Multistage switches – I - Multistage switches – II- Software multithreading – I - Software multithreading – II.

UNIT 5 PARALLEL PARADIGMS AND PROGRAMMING MODELS 9

Paradigms and programming - Programmability issues - Parallel programming models - Shared Memory programming - Message –passing Paradigm- Message passing interface(MPI) – I - Message passing interface(MPI)- II - Parallel Virtual Machine .

Text Books:

1. Kai Hwang and Zhi .Wei Xu - **Scalable Parallel Computing -** Tata McGraw-Hill, New Delhi, 2003.

References:

1. Ananth Grama,Vipin Kumar - **Introduction to parallel computing -** 2007
2. David E. Culler & Jaswinder Pal Singh - **Parallel Computing Architecture: A Hardware/Software Approach -** Morgan Kaufman Publishers, 1999.

Course Code	Course Title	L	T	P	C
MC13E11	OBJECT ORIENTED ANALYSIS AND DESIGN	3	0	0	3

Course Rationale:

- To understand the basic principles of object oriented concepts.
- To learn UML diagrams, notations and their uses
- To develop software requirement specification and design model using object oriented approach
- To apply object oriented testing on Real Time applications
- To enable the learner for aspiring careers in Software Product Architecture

Course Objectives:

At the end of this course, the learners is expected :

- To ensure quality and reusability while developing software
- To analyze and design the problem domain using unified Object approach
- To identify and categorize business, access and view layer objects of the application
- To derive OOA & OOD phases using UML diagrams and CASE tools
- To understand effective OO testing strategies

UNIT 1 OO BASICS & METHODOLOGIES 8

OO Approach & Benefits - OO Concepts – I- OO Concepts – II - OO life cycle & Quality attributes - Rumbauah methodology- Booch Methdology- Jacobson Methdology- Case Study

UNIT 2 UML DIAGRAMS & UNIFIED APPROACH 12

UML Architecture - Foundations, rules and mechanisms- Use Case diagram- Class Diagram- Activity, state chart diagram - Interaction diagrams- Component, deployment diagram - Object diagram, Packaging - Unified Model, layered architecture-OOA, OOD steps –CBD-Patterns & Frameworks

UNIT 3 OOA 9

Business Process Analysis- OOA steps- Identify Actors, Business Process Model- Identify UseCase, Usecase Documentation- Identify classes, Classification theorem -Usecase, sequence diagram approach-Noun phrase approach- CRC, class pattern approach- Develop static UML class diagram- Refine static UML class diagram

UNIT 4 OOD 10

OOD Steps - Design business layer classes - Case study- Database, distributed, Object databases - Table class mapping- Access layer classes approach- Case study- UI design rules- Guidelines for UI designing - Design view layer classes.

UNIT 5 OO TESTING 6

Impact of OO testing - Class testing, state based testing - Polymorphism, inheritance, integration testing - Usability, user satisfaction testing - Debugging principles- OO Metrics

Text Books:

1. Ali Bahrami – **Object Oriented System Development** – Tata McGraw Hill, 2008.
2. Grady Booch, , Ivar Jacobson, James Rumbaugh - **The Unified Modeling Language User Guide** - Pearson Education, 2nd edition, 2005.
3. Craig Larman – **Applying UML & Patterns: An Introduction to Object oriented analysis and design** – Addison Wesley Professional, 3rd Edition, 2004.

References:

1. Timothy C. Lethbridge, Robert Laganiere - **Object-Oriented Software Engineering – A practical software development using UML and Java -** McGraw-Hill**,** 2004.
2. H. Srimathi, H.Sriram, and A. Krishnamoorthy – Object **oriented analysis and design using UML** – Scitech publication, 2nd edition, 2006.
3. Stephen R. Schach - **Introduction to Object Oriented Analysis and Design -** McGraw Hill, 8th edition, 2010.

Course Code	Course Title	L	T	P	C
MC13E12	CRYPTOGRAPHY	3	0	0	3

Course Rationale:

- To learn and implement the cryptanalyst classical ciphers.
- To demonstrate a basic understanding of modern private-key cryptosystems and ways to cryptanalyze them.
- To learn the basic understanding of the mathematical concepts underlying modern cryptography
- To enable the learner to become a Cryptographer and Security Software Engineer.

Course Objectives:

At the end of the course, the leaner will be able :

- To understand the concept of Symmetric key encryption including classical encryption techniques.
- To understand various asymmetric encryption techniques
- To understand the concept of hash algorithms and digital signatures.
- To know about the various block ciphers modes of operations
- To gather extensive Knowledge about the Key Management and Distribution methods

UNIT 1: OVERVIEW 9

Definition of Computer Security -Security Attacks - Model for Network Security -**Classical Encryption Techniques :** Symmetric Cipher Model - Substitution Techniques- Caesar Cipher - Monoalphabetic Ciphers- Playfair Ciphers-Hill Cipher- Polyalphabetic Ciphers - One-Time Pad- Transposition Techniques- Rotor Machines – Steganography -**Block ciphers and the data encryption standard :** Block cipher principles-DataEncryption standard(DES) - Strength of DES - Block cipher Design principles.

UNIT 2: BASIC CONCEPTS IN NUMBER THEORY 9

Euclidean Algorithm - Modular Arithmetic - **Advanced Encryption Standard(AES) -** AES Structure - AES Transformation - AES Key Expansion - **Block Cipher Operation** -Multiple Encryption and Triple DES - Block Cipher modes of operation- Electronic Code Book - Cipher Block- Chaining Mode Cipher - Feedback Mode - Output Feedback Mode - Counter Mode.

UNIT 3: INTRODUCTION TO NUMBER THEORY 9

Prime Number- Fermat's and Euler's Theorems - **Public-Key Cryptography and RSA-** Principles of Public-key Crypto systems - RSA Algorithm - Solving problems using RSA Algorithm - **Public-key Cryptosystems** - Diffie-Hellman Key Exchange - Elgamal Cryptographic Systems - Solving problems using Diffie-Hellman Key Exchange and Elgamal - Solving problems using Elgamal Cryptographic Systems.

UNIT 4: CRYPTOGRAPHIC HASH FUNCTIONS 9

Applications of Cryptographic Hash Functions (Message Authentication) -Applications of Cryptographic Hash Functions (Digital Signature) - Secure Hash Algorithm(SHA) - SHA-512 Round Function -SHA-3 - Message Authentication Codes(MAC) -Message Authentication Requirements-Message Authentication Functions-Message Encryption-Message Authentication Code.

UNIT 5 DIGITAL SIGNATURES 9

Digital Signatures - Digital Signature Standard- Key Management and Distribution: Symmetric Key Distribution using Symmetric Encryption- Key distribution Scenario-Hierarchical Key Control - Session Key Lifetime -Transparent Key Control Scheme -Decentralized Key Control-Controlling Key Usage -Symmetric Key Distribution using Asymmetric Encryption-Simple Secret Key Distribution-Secret Key distribution with confidentiality and authentication-Distribution of Public Keys - X.509 Certificates.

Text Books:

1. William Stallings - **Cryptography and Network Security -** Pearson Education, New Delhi, 5th Edition, 2011
2. Behrouz A. Forouzan, DebdeepMukhopadhyay - **Cryptography and Network Security -** Tata McGraw-Hill Education Pvt. Ltd., 2nd Edition, 2011

References:

1. Charles Pfleeger - **Security in computing -** Prentice Hall of India, 4th Edition, 2006.

Course Code	Course Title	L	T	P	C
MC1336	PERSONALITY DEVELOPMENT – II	2	0	0	2

Course Rationale:

- To improve aptitude skills, problem solving skills and reasoning ability
- To make them prepare and give professional presentations
- To prepare students to a higher level of reading

Course Outcome:

At the end of this course, the learner is expected :

- To adopt new techniques in problem solving.
- To enhance reasoning ability.
- To enrich ability in Modern Mathematics.
- To read and understand difficult passages

UNIT 1: NUMBERS & ALGEBRA 10

Numbers I - Numbers II – Logarithm -Simple Equations- Ratio & Proportion

UNIT 2: MODERN MATHEMATICS 10

Percentage, Profit & Loss - Venn Diagram- Permutation –Combinations - Probability

UNIT 3: REASONING 10

Analytical Reasoning I - Analytical Reasoning II- Logical Reasoning –Blood Relations / Directions - Logical Reasoning – Number series - Logical Reasoning – Coding /Decoding/ Odd man out

UNIT 4: PRESENTATION SKILLS 12

Extempore - Company Profile/Area of Interest/Recent Developments

UNIT 5: ANALYTICAL READING 3

Reading Comprehension & Critical Reasoning - Level 2 - Cloze test - Anagrams

Text Books:

1. Abhijit Guha - **Quantitative Aptitude for Competitive Examination** - 4th edition, Tata McGraw Hill Education, 2010.
2. R.S. Agrawal - **Quantitative Aptitude for Competitive Examination** - S.chand Publishing, New Delhi, 2012.

References:

1. Arun Sharma - **Logical Reasoning** - Tata McGraw Hill, 2012.
2. Edsar Thorpe - **Test of Reasoning** - Tata McGraw Hill, 4th edition, 2007.
3. R.S. Agarwal - **Verbal & Non Verbal Reasoning** - S.Chand Publishing, New Delhi, 2012.

Course Code	Course Title	L	T	P	C
MC1341	SOFTWARE ENGINEERING	3	0	0	3

Course Rationale:

- To gain knowledge about various Software Engineering Paradigms.
- To carry out testing at various levels by applying the Testing Tactics
- To identify the Software Risks and Prepare suitable Mitigation Plan
- To suggest the Quality Assurance and Change Management Activities
- To enable the learner for aiming careers in Software Engineering related fields.

Course Objectives:

At the end of this course the learner is expected:

- To classify the various Software Process Models
- To build an Analysis Model and subsequently architect a suitable design
- To understand Testing Strategies and Testing Tactics
- To plan and Schedule the Project
- To appreciate SQA and SCM principles

UNIT 1: INTRODUCTION TO SOFTWARE ENGINEERING **9**

Characteristics of software -The Changing Technology -Capability Maturity Model Integration, Personal and Team Process Models -Process Models – Prescriptive models and The Waterfall Model - The Incremental Model and The RAD Model -Evolutionary Process Models -Specialized Process Models and The Unified Process -An agile view of Process.

UNIT 2: REQUIREMENTS ANALYSIS AND DESIGN **9**

System Engineering and its hierarchy - Business Process Engineering and Product Engineering - Requirements Engineering Tasks-Initiating the Requirements Engineering Process-Eliciting Requirements-Analysis Modeling Approaches and Scenario based Modeling-Flow Oriented Modeling and Class Based ModelingSoftware Design Concepts- Various Design Models

UNIT 3: TESTING STRATEGIES AND TACTICS **9**

Introduction to Testing and Definition of Testing Terminologies-Testing Strategies for Conventional Software-Debugging Process-Testing Tactics – White Box Testing-Black Box Testing and Object Oriented Testing Methods-Testing for Specialized Environments

UNIT 4: PROJECT MANAGEMENT, ESTIMATION AND SCHEDULING **9**

Project Management Spectrum andW5HH Principle-The People and the Product-Melding the Product and the Process; Process Decomposition-Metrics for Process and Projects-The Project Planning Process; Software Scope and Feasibility-Software Project Estimation and Decomposition Techniques-Empirical Estimation Models-Project Scheduling Concepts – Timeline charts and Tracking the Scheduling; Earned Value Analysis

UNIT 5: QUALITY, CHANGE AND RISK MANAGEMENT **9**

Reactive and Proactive Risk Strategies – Software Risks -Risk Mitigation, Monitoring and Management -Quality Concepts applied to Software Industry -Software Quality Assurance -Software Reviews and Formal Technical Reviews -Statistical Quality Assurance and Quality Standards -The Software Configuration Management Repository -The Software Configuration Management Process -Business Process Reengineering and Reverse Engineering -Restructuring and Forward Engineering -The Road Ahead -New Modes of Representing Information

Text Books:

1. Roger S. Pressman – **Software Engineering: A Practitioner Approach** - McGraw Hill – International Edition – Sixth Edition – 2004. (Chapter – 1- 4, 6 - 9,13-15, 21-27, 31, 32)
2. Waman S Jawadekar – **Software Engineering: Principles and Practice** – McGraw Hill Education Private Limited, 2004

References:

1. Nashib Singh Gill– **Software Engineering** -Khanna publications – 2002
2. Sommerville I. – **Software Engineering** - Addison Wesley – 1996
3. Carlo Ghezzi, Mehdi Jazayari, Dino Mandrioli – **Fundamentals of Software Engineering** - Prentice Hall of India – 1991.

Course Code	Course Title	L	T	P	C
MC1342	ADVANCED JAVA PROGRAMMING	3	0	3	4

Course Rationale:

- To import the knowledge on the advanced concept of Java Programming skills.
- To provide a basic understating and knowledge of the latest Java programming concept.
- To equip the students in programming skills used to relate with the IT industry.
- To enable the learner for aiming careers such as Programmers (Java), Developers and Program analysts.

Course Objectives:

At the end of this course the learner is expected:

- To be familiarize with Advanced Concepts of Java like Swing and RMI
- To understand the Java Servlets and Database connectivity.
- To learn about the networking principle and implementation
- To know more about the Enterprise Java Bean (EJB) Programming

UNIT 1: BEAN EXAMPLE INTRODUCING SWING & JAVA BEANS 9

Exploring Swing -JLabel and ImageIcon, JTextField -The Swing Buttons – JTabbedPane -JScrollPane, JList & JcomboBox -Trees & JTables -What Is a Java Bean? - Advantages of Java Beans -Introspection, Bound and Constrained Properties -Persistence & Customizers -The Java Bean API-A.

UNIT 2: RMI & NETWORKING 9

Remote Method Invocation -Settingup Remote Method Invocation -RMI with Applets -Networking Basics - The Networking Classes and Interfaces -InetAddress -Inet4Address and Inet6Address -TCP/IP Client sockets -URL - URL Connection -HttpURL Connection .

UNIT 3: JDBC 9

Presentation to JDBC CONNECTION settings -The Concept of JDBC -JDBC Driver Types -JDBC Packages -A Brief Overview of the JDBC Process -Database Connection -Associating the JDBC/ODBC Bridge with the Database -Statement Objects – ResultSet -Transaction Processing & Metadata.

UNIT 4: SERVLETS & JSP 9

Background, The Life Cycle of a Servlet & The JSDK-A Simple Servlet -The Servlet API -RolePlay-Servlet Concept-The javax.servlet Package -Reading Servlet Parameters, The javax.servlet.http Package -Handling HTTP Request and Responses – Using Cookies -Session Tracking -JSP – JSP Tags – Tomcat -Request String – UserSessions -Cookies – Session Objects

UNIT 5 : EJB 9

Enterprise JavaBeans -Deployment Descriptors -Session Java Bean -Entity Java Bean -Message-Driven Bean -The JAR File -Case study : Financial Applet

Text Books:

1. Herbert Schildt – **JAVA The Complete Reference –** McGraw-Hill, 5th Edition - 2007.
2. S. Horstmann, Gary Cornell – **Core Java 2 Volume II – Advanced Features -** Addison Wesley, 2007.

References:

1. Jim Keogh – **J2EE The Complete Reference –** Tata McGraw-Hill Edition - 2002.
2. Hans Bergsten – **JavaServer Pages, 3rd Edition -** O'Reilly. – 2003
3. SHerbert Schildt – **Java the complete reference** – McGraw Hill – 8th Edition – 2011.

Course Code	Course Title	L	T	P	C
MC1343	ASP.NET	3	0	3	4

Course Rationale :

- To learn .NET framework and Life cycle
- To understand ASP.NET control and ADO.NET Concepts
- To acquire a working knowledge of creating and consuming Web Services
- To enable the learner for aiming careers in Web Application Development and Micro Soft solution/product development

Course Objectives:

At the end of this course the learner is expected :

- To gain indepth knowledge on .NET frame work
- To gather more information about Web Applications
- To show extensive knowledge in Web Development
- To generate Web Service based upon Service Oriented Architecture

UNIT 1 : INTRODUCTION TO .NET **9**

Introduction to .NET & its Benefits -Architecture of .NET Framework ASP.NET Introduction &Features -Life cycle of ASP.NET -File Types -Exploring ASP.NET Web Pages -Page directives-Application Structure & state-Case study

UNIT 2: ASP.NET CONCEPTS- **9**

Standard Controls-Creating Web Application-Navigation Controls-Validation controls -Application programs -Web parts controls -Web parts controls and Program.

Unit 3 : ADO .NET **9**

ADO.NET Framework-Grid View-Data list-Repeater-From view -Designing Application-ADO.NET Managed Providers-SqlDataSource Managed Provider-OLDB managed provider.

UNIT 4: LING QUERIES AND SECURITY **9**

LINQ queries –Introduction -Query operators-Query operators -LINQ to ADO .NET-Create Application for LINQ to ADO.NET-LINQ to XML -LING to Objects-Create Application For LINQ to XML -Security Using Login control.

UNIT 5: CONFIGURATION AND WEB SERVICES **9**

Caching Introduction-Output Caching-Data Caching -Globalization-Infrastructure of ASP.NET Web service-Web service Wire Formats-Creating Web Services -ASP.NET Configuration-Deploying Web Applications.

Text Books:

1. Kogent **– ASP.NET 3.5 Black Book – Platinum Edition -** Dreamtech Press -2010.
2. Kogent **– .NET 3.5 Black Book – Platinum Edition -** Dreamtech Press - 2010

References:

1. Kogent **– ASP.NET 3.5 in Simple Steps -** Dreamtech Press - 2010
2. Greg Buczek – **ASP.Net Developer's Guide** – Tata McGraw Hill publishing Company Ltd. - 2010
3. Mathew Mac Donald - **ASP.NET Complete Reference -** Tata McGraw Hill publishing Company Ltd - 2010

Course Code	Course Title	L	T	P	C
MC1344	UNIX AND NETWORK PROGRAMMING	3	0	3	4

Course Rationale :

- To provide a background on the UNIX system call interface.
- To learn Advanced Programming concepts in UNIX Environment.
- To introduce network programming under UNIX.
- To enable the learner to become Unix System Analyst / Unix Administrator in the IT Industries.

Course Objectives:

At the end of this course the learner is expected :

- To store and retrieve the information from Unix Files.
- To perform Inter process communications.
- To implement Echo Client / Server using TCP and UDP.
- To develop client/server applications using the standard UNIX network programming protocols.

UNIT 1: FILES & DIRECTORIES **9**

Study of Open, Close, Read , Write. Lseek, Dup -stat, fstat, and lstat functions-.File Types -Set user ID and Set Group ID - File Access Permissions -Study of Access, umask, Chmod, Link and Unlink Functions-Mkdir and Rmdir -Reading Directories -chdir, fchdir and getcwd Functions.-

UNIT 2: PROCESS CONTROL & SIGNALS **9**

Time and Date Routines-Setjmp and Longjmp Functions -Fork , Vfork -Exec -wait and waitpid -wait3 and wait4 -Signal concepts, signal function -kill and raise – alarm and pause – abort and sleep - sigprocmask – sigpending – sigaction.

UNIT 3: INTER PROCESS COMMUNICATION **9**

Pipes - FIFO-System V IPC – Introduction-Message Queue-Message Queues – Example Program - Semaphores - Example Program -Shared Memory- Example Program

UNIT 4: SOCKET PROGRAMMING **9**

Sockets – Introduction -Elementary TCP Sockets -TCP Echo Client/ Server -Elementary UDP Sockets -UDP Echo Client/ Server-gethostbyname& gethostbyaddr, getservbyname &getservbyport – getaddrinfo -tcp_connect and tcp_listen, udp_client, udp_connect and udp_server.

UNIT 5: DAEMON PROCESS & DATA TRANSMISSION 9

Syslogd Daemon -syslog function -inetd Daemon -Broadcost Addresses – Unicast Versus Broadcast - Multicast Addresses -Multicasting Versus Broadcasting on LAN, Multicasting on WAN -Raw Socket : Creation – Input – Output -Datalink Access : BPF – DLP -SOCK_PACKET-

Text Books:

1. Richard Stevens .W & Stephen Rago - **Advanced Programming in the UNIX Environment** – 2nd Edition - Pearson Education Asia - 2005
2. Richard Stevens .W - **UNIX Network Programming, Volume II** - Prentice Hall, 1999.

References:

1. Stephen A.Rago – **Unix System V Network Programming** – Addision Wesley – 1993.

Course Code	Course Title	L	T	P	C
MC1345	MICROPROCESSOR AND ITS APPLICATIONS	3	0	3	4

Course Rationale :

- To explore system architecture of different hardwares
- To understand system design concept associated with microprocessor
- To enable the learner for aiming careers in embedded systems / component software systems.

Course Objectives:

At the end of this course the learner is expected:

- To understand the basic concepts underlying a programmable device such as data-buses, machine cycles, various processes of data flow, internal register architecture, programming and interfacing.
- To understand practical design of microcomputer based on the Components of and function of 8086 Architecture
- To understand how the system works under minimum and maximum mode and signal functions

UNIT 1: MICRO COMPUTER AND MICROPROCESSOR 9

An Introduction -Overview of microcomputer structure- Microprocessor evolution and types - The 8086 microprocessor family –overview -8086 internal architecture -Pin configuration of 8086 - Program development steps - Assembly language Program development tools -Writing assembly programs

UNIT 2:8086 INSTRUCTION DESCRIPTION AND ASSEMBLER DIRECTIVES 9

8086 Addressing Mode-Instruction set Introduction -Arithmetic instruction -logical instruction - String, Procedure and macros - Loop Instruction , Jump Instruction - Move, stack and Rotate Instruction -BIT Manipulation Instruction -String manipulation instruction -Assembly language Program -Assembler Directives

UNIT 3:8086 SYSTEM CONNECTIONS AND INTERRUPT APPLICATIONS 9

Basic 8086 Microcomputer System -Using Logic Analyzer to observe Microprocessor Bus Signals - Minimum Mode system -Troubleshooting a simple 8086 based Microcomputer -8086 Interrupt and Interrupt Responses -8086 Interrupt Types -Hardware and software Interrupt Applications -8259 Priority Interrupt Controller -Software Interrupt Applications

UNIT 4: DISPLAY CONTROLLER AND DMA 9

Keyboard / Display Controller -8254 software- programmable Timer/Counter -8254A counter modes and applications- Digital Signal processing and digital filters -DMA data transfer -signal of 8257 - internal architecture of 8237-A Micro computer based industrial process control -Robotics and embedded controller –

UNIT 5: 80286, 80386,80486 MICROPROCESSORS 9

Introduction to Multi-user / Multitasking Operating system -Time Slicing Scheduling -Memory Management -Virtual Memory -Intel 80286 Microprocessor Architecture-80286 Real Address mode Protected mode operation-Intel 80386 Microprocessor Architecture-80386 Real Address mode Protected mode operation-Intel 80486 Microprocessor Architecture

Text Books:

1. Douglas V. Hall – **Microprocessors and Interfacing – Programming and Hardware** – McGraw Hill – Second Edition - 1991. (Chapter No. 2 – 11,13,15)

References:

1. Yu-Chengh Liu and Gibson – **Microcomputer systems 8086/8088 family** – Prentice Hall – Second Edition - 1996.
2. Ray A.K and Bhurchandi – **Advance Microprocessors and Peripherals, Architecture programming and Interfacing** – McGraw Hill International – First Edition – 2000.

Course Code	Course Title	L	T	P	C
MC13E13	MOBILE COMPUTING	3	0	0	3

Course Rationale :

- To learn mobile computing features and advanced features
- To develop competency in enhancing computing techniques.
- To implement and maintain an efficient computing system using emerging trends.
- To enable the learner for aspiring careers in Mobile related Computing Services

Course Objectives:

At the end of this course the learner is expected:

- To describe the basic concepts of mobile communications
- To describe the design of mobile architecture.
- To know how to design with mobile OS.
- To discuss the emerging mobile applications

UNIT 1: WIRELESS TRANSMISSION **9**

History of wireless transmission-Wireless transmission-Frequencies for Radio Transmission-Signals - Antennas-Signal propagation -Multiplexing-TDM,FDM, CDM, SDM

UNIT 2: MODULATION & SWITCHING **9**

Modulation – introduction & its types -Modulation – ASK & FSK, PSK -Medium access control – Motivation for a specialized MAC -SDMA-FDMA-TDMA-CDMA-Comparing FDMA/CDMA/TDMA

UNIT 3: TELECOMMUNICATION SYSTEMS **9**

GSM- DECT -TETRA-UMTS and IMT -2000.-Satellite systems-Basics-GEO satellite - LEO satellite-MEO satellite -Routing -Localization & Handover

UNIT 4: BROADCAST SYSTEMS **9**

Broadcast systems : Digital Audio Broadcasting-Digital Video Broadcasting-Wireless LAN: Infrared Vs Radio Transmission-IEEE 802.11.

UNIT 5: MOBILE NETWORK LAYER **9**

Mobile IP- DHCP-Mobile Adhoc networks-traditional TCP -Classical TCP improvements -Support for mobility -WWW-WAP- Case study : Android OS ,Symbion OS

Text Books:

1. Jochen Schiller - **Mobile Communications** – Pearson Education – 2nd Edition - 2008.
2. William Stallings - **Mobile Communications and Networks** – Pearson Education – 2005

References:

1. C.Y.Lee & William - **Mobile Cellular Telecommunication**– McGraw Hill Inter Edition – 1997.

Course Code	Course Title	L	T	P	C
MC13E14	NEURAL NETWORKS	3	0	0	3

Course Rationale :

- To learn the basic functions, principles and concepts of Neural Networks.
- To understand the applications of Neural Networks.

- To enable the learner for aiming careers in Academics and Research in neural networks related areas.

Course Objectives:

At the end of this course the learner is expected:

- To understand the basics of ANN and comparing with Human Brain
- To distinguish the various architectures of building an ANN
- To describe the Pattern classification in Neural Networks

UNIT 1: INTRODUCTION TO CELL AND THEIR STRUCTURES 9

Action potential,dendrites, synapse and axon Biological Neural Network Vs Artificial Neural Network History and Applications of ANN. Different Architectures of ANN-Different Learning algorithms of ANN-Common activation functions Development process of ANN, Setting of weights, simple OR function simulation McCullosh and Pitts model MP model simulation of OR,AND,NOT functions.

UNIT 2: SIMPLE NEURAL NETS FOR PATTERN CLASSIFICATION 9

Learning algorithms, Supervised and Unsupervised - Hebbian network architecture -Hebbian network algorithm and Application -Perceptron network architecture and its limitations -XOR problem and its solution -Perceptron applications -Adaline architecture and learning -Back propagation network, BP Algorithm Derivation of weight adjustment terms

UNIT 3: PATTERN ASSOCIATION 9

Pattern Association preliminaries-Pattern associator properties Associative memories and networks -Auto associative net, algorithm and weight setting-Hetero associative net, algorithm and weight setting Problems related to Associative memories -Bidirectional associative memories, weight setting and algorithms -BAM and its various forms -Problems related to BAM.

UNIT 4: NEURAL NETS BASED ON COMPETITION 9

Competitive networks -Lateral inhibition nets, Maxnet, Mexican Hat etc.- Kohonen SOM architecture -SOM learning algorithm-Advantages of SOM and its applications -Learning Vector Quantization-LVQ advantages and disadvantages -Counter-propagation networks Architecture-CPN algorithm and applications

UNIT 5: ADAPTIVE RESONANCE THEORY AND NEOCOGNITRON 9

ART-1 architecture and operation -ART-1 algorithm and applications -ART-II architecture and operation-ART-II algorithm and applications -Probabilistic Neural Network,Architecture and algorithm-Cascade Correlation Network and itsAdvantages -Cascade Correlation learning algorithm -Neocognitron architecture -Neocognitron learning algorithm

Text Books:

1. Laurene Fausett - **Fundamentals Of Neural Networks-Architectures, Algorithms and Applications -** Pearson Education, 2004
2. James. A.Freeman and David.M.Skapura - **Neural Networks Algorithms, Applications and Programming Techniques -** Pearson Education , 2002.

References:

1. B.Yegnanarayana - **Artificial Neural Networks -** Prentice - Hall, of India, 2001.
2. Simon Haykin - **Neural Networks - A Comprehensive Foundation -** Pearson Education – 2001.

Course Code	Course Title	L	T	P	C
MC13E15	NETWORK SECURITY	3	0	0	3

Course Rationale:

- To identify and assess current and anticipated security risks and vulnerabilities
- To develop a network security plan and policies
- To use the best practices to design, implement, and monitor a network security plan.
- To identify elements of firewall design, types of Intruders, Viruses and security threats and responses to security attacks. .
- To enable the learner to become a network security specialist.

Course Objectives :

At the end of the course, the leaner expected :

- To understand the concept of Transport Level Security, Wireless Network Security and Electronic Mail Security
- To know about the IP Security
- To gather extensive Knowledge about the System Security

UNIT 1: TRANSPORT LEVEL SECURITY 9

Web Security considerations - Secure Socket Layer SSL Architecture - SSL Record Protocol Change Cipher - Spec Protocol - Handshake Protocol - Cryptographic Computations - Transport Layer Security - Version Number-MAC - Pseudorandom Function - Alert Codes – HTTPS - Connection Initiation & Closure - SSH Transport Layer Protocol – Connection Protocol

UNIT 2: WIRELESS NETWORK SECURITY 9

IEEE 802.11 Wireless LAN overview, IEEE802.11i Wireless LAN Security IEEE802.11i Services - IEEE802.11I Phases of Operation - Discovery Phase - Authentication Phase - Key Management Phase - Protected Data Transfer Phase - IEEE802.11i Pseudorandom Function - Wireless Application Protocol Overview - Operational Overview - Wireless Markup Language - WAP Architecture - Wireless Application Environment WAP protocol Architecture - Wireless Transport Layer Security WTLS Sessions and Connections WTLS Protocol Architecture - Cryptographic algorithms - WAP End-to-End Security

UNIT 3: ELECTRONIC MAIL SECURITY 9

Pretty Good Privacy - Notation - Operation Description - Cryptographic Keys and Key Rings - Public Key Management - S/MIME RFC 5322 MIME - S/MIME Functionality and Messages - S/MIME Certificate Processing - Enhanced Security Services - Domain Identified Mail Internet Mail Architecture E-Mail Threats -DKIM Strategy DKIM Functional Flow

UNIT 4: IP SECURITY 9

IP Security Overview - IP Security Policy - Security Associations Security Associations Database - IP Traffic Processing - Encapsulating Security Payload ESP Format Encryption and Authentication Algorithms - Padding Anti-Replay Service Transport and Tunnel Modes - Combining Security Associations Authentication Plus Confidentiality - Basic Combinations of Security Associations - Internet Key Exchange Key Determination Protocol - Header and Payload Formats

UNIT 5: SYSTEM SECURITY 9

Intruders Intruder Behavior Patterns Intrusion Techniques - Intrusion Detection - Audit Records Statistical Anomaly Detection - Rule-Based Intrusion Detection The Base-Rate Fallacy - Distributed Intrusion Detection Honeypots - Intrusion Detection Exchange Format - Password Management - Password Protection - Password Selection Strategies - Malicious Software - Types Of Malicious Software - Viruses - Virus Countermeasures – Worms - Distributed Denial of Service Attacks – FIREWALLS - Needs of Firewalls - Firewall Characteristics - Types of Firewalls - Firewall Basing - Firewall Location and Configurations

Text Books:

1. William Stallings - **Cryptography and Network Security -** Pearson Education, New Delhi, 5th Edition, 2011. (Chapter 16 – 19 and online chapter 20 – 22)

References:

1. Behrouz A. Forouzan, Debdeep Mukhopadhyay - **Cryptography and Network Security -** Tata McGraw-Hill Education Pvt. Ltd., 2nd Edition, 2011
2. Charles Pfleeger - **Security in computing -** Prentice Hall of India, 4th Edition, 2006.

Course Code	Course Title	L	T	P	C
MC13E16	COMPILER DESIGN	3	0	0	3

Course Rationale :

- To design and implement a simple compiler.
- To understand how a compiler works.

- To enable the learner for aiming careers in Testing Compilers in different software environments.

Course Objectives:

At the end of this course, the learner is expected :

- To understand, design and implement a lexical analyzer
- To develop, design and implement a parser
- To interpret code generation schemes
- To describe optimization of codes and runtime environment

UNIT 1: INTRODUCTION TO COMPILERS **9**

Introduction to compiler - translators - Structure of compiler - Compiler writing tools - Regular expression – NFA – DFA - NFA to DFA - Minimizing the DFA

UNIT 2: SYNTACTIC SPECIFICATION AND PARSING **9**

Context-free grammars - Parse trees - Parser types - Shift-reduce parsing - Operator-precedence parsing - Operator-precedence parsing - Top-down parsing - Predictive parsers - Predictive parsers

UNIT 3: SYNTAX-DIRECTED TRANSLATION AND SYMBOL TABLE **9**

Syntax-directed translation schemes - Implementing of syntax-directed translators - Intermediate code and postfix notation - Parse trees and syntax trees - Contents of symbol table - Contents of symbol table - Data structures for symbol table - Data structures for symbol table - Representing scope information

UNIT 4: ERROR DETECTION AND CODE OPTIMIZATION **9**

Errors - Lexical-phase errors - Syntactic-phase errors - Semantic errors - Principal sources of optimization - Loop optimization - DAG representation of basic blocks - Value numbers and algebraic laws - Global data-flow analysis

UNIT 5: CODE GENERATION **9**

Object programs - Problems in code generation - A machine model - A simple code generator - Register allocation and assignment - Register allocation and assignment - Code generation from DAG's - Peephole optimization

Text Books:

1. Alfred V. Aho and Jeffery D. Ullmam – **Principles of Compiler Design** – Naraosa Publishing House -2002

References:

1. Alfred V.Aho, Monica S. Lam, Ravi Sethi, Jeffrey D.Ullman - **Compilers, principles, techniques, and tools** - Pearson Education - 2009.

Course Code	Course Title	L	T	P	C
MC13E17	CYBER CRIME AND LAWS	3	0	0	3

Course Rationale :

- To learn the principles of computer investigations and digital evidence.
- To learn about jurisdiction, chain of evidence, and legal authority. social, legal, and ethical implications will be carefully considered.
- To prepare students for careers in homeland defense, law enforcement, or commercial IT security and for graduate work in security, information systems, or law.

Course Objectives :

At the end of the course, the leaner is expected:

- To introduce the cyber world and cyber law in general
- To explain about the various facets of cyber crimes
- To enhance the understanding of problems arising out of online transactions and provoke them to find solutions
- To clarify the Intellectual Property issues in the cyber space and the growth and development of the law in this regard

- To educate about the regulation of cyber space at national and international level
- To understand applicable laws, and the roles of legal authorities.

UNIT 1: INFORMATION AGE AND CYBER CRIME 9

Cyber Space - Relational ship between Computers Crime and Law - The Economy: Knowledge-based From Information Super-highway to the Information Society - The Nature and Concept of Crime - Mental Elements of Crime - Brief Historical Perspective of Criminal Law - Classification of Crimes - Criminal Responsibility - Theories of Aetiology of Crime - Theories and objectives of Punishment - The Organized Crime - The "White-Collar" Crime - Cyber Crime - Cyber Crime - Definition of "Computer Crime" - Computer Crime categories - Types of Computer Crimes -Classification of Computer Crime - Crime on Web - Indian Scenario - Cyber Jurisdiction - Definition of Cyber Jurisdiction - Model for Jurisdictional Analysis

UNIT 2: CYBER CRIME AND CRIMINAL CODIFICATION IN INDIA 9

Indian Penal Code : I to III - Indian Penal Code : IV to VI - Indian Penal Code : VII to IX - Indian Penal Code : X to XII - Indian Penal Code : XIII to XV - Indian Penal Code : XVI to XVIII - Protection of Intellectual Property –I – Patents - Indian Patent Law - Trade Marks – Databases

UNIT 3: PROTECTION OF INTELLECTUAL PROPERTY – II 9

Copyrights - Digital Signature - Working of Digital Technology - Privacy Issues in the Information Age - Privacy and Surveillance - Privacy : Meaning - Legal Perspective and Framework - Kind and Pattern Intrusions Motive - Methods of Attack - Topology of Intruders - Global Differences - Future Issues

UNIT 4: COMMUNICATION NETWORK AS SURVEILLANCE TOOL 9

The Web – Intelligence Tool – Espionage - The Interlude - Data and Information Processing - The operations - The Tradecraft - The armament - Economic Intelligence and Attacks - Web or Net Crimes - Information Warfare - Hackers Psychology and Laws Related To Hacking - Genesis of the term Hacker - Theories of Delinquency

UNIT 5: IDENTITY AND INFORMATION THEFT 9

Identity Theft case Files - Avoid being an Easy Target - Cyber Fraud and Electronic Misuse - Definition of Computer Fraud or cyber Fraud - Characteristics Cyber Fraud Offence - How the Victims and Cyber Fraud are Deceived? - The legal Issues - Fraud-Related Offenses - Protection of Cyber Crimes - Encryption in Crime and Terrorism - Law Enforcement Options - Other Technologies for Hiding Evidence - Concealing Crimes through Anonymity

Text Books:

1. Prof.Parag Diwan, Dr.R.K.Suri and Dr.Sanjay Kaushik, Cyber Crime(Volume : 11,IT Encyclopaedia.com , Pentagon Press, New Delhi, 4th Edition, 2003

References:

1. G.Ram Kumar, Cyber Crimes (A Primer on Internet Threats and Email Abuses)**,Viva Books Private Limited,** 2010
2. Johnson, Thomas A.-Forensic Computer Crime Investigation Boca Raton-Fla: CRC –Press-2006

Course Code	Course Title	L	T	P	C
MC13E18	INFORMATION STORAGE AND MANAGEMENT	3	0	0	3

Course Rationale :

- To learn various Informational Storage Concepts, Storage Networking Technologies and Virtualization
- To provide Business Continuity, Storage security and management
- To enable the learner for aiming careers in data warehousing and data storage related areas.

Course Objectives:

At the end of the course, the leaner is expected:

- To evaluate storage architectures, including storage subsystems, DAS, SAN, NAS, CAS
- To define backup, recovery, disaster recovery, business continuity, and replication
- To examine emerging technologies including IP-SAN
- To understand logical and physical components of a storage infrastructure

• To identify components of managing and monitoring the data center
• To define information security and identify different storage virtualization technologies

UNIT 1: INTRODUCTION **9**

Information Storage, Evolution of Storage - Technology & Architecture - Data center Infrastructure, Information - Life cycle - Storage System Environment - Components of Storage System - Environment, Disk Drive Components - Logical Components of the Host - Data protection - Implementation of RAID, RAID Array Components - RAID Levels - RAID Performance comparisons - Components of Intelligent Storage systems - Intelligent Storage Array

UNIT 2: DAS, SCSI, AND STORAGE NETWORKING **9**

Types of DAS, Benefits and Limitations - Disk Drive Interfaces - Parallel SCSI - SAN-Evaluation, Components of SAN - Fibre Channel Connectivity - FC Architecture, FC Topologies - NAS-Benefits of NAS - Components of NAS - NAS Protocols, I/O Operations

UNIT 3: IP SAN, CAS AND STORAGE VIRTUALIZATION **9**

IP SAN-introduction, components of iSCSI, FCIP, case study; Content Addressed Storage(CAS) – fixed content and archives, types of archives, CAS Architecture, case study; Storage Virtualization – forms of virtualization, taxonomy, types of storage virtualization, case study.

UNIT 4: BUSINESS CONTINUITY **9**

Introduction, BC terminology, BC planning lifecycle, impact analysis, case study; Backup and recovery – purpose and considerations, topology , technologies, case study; local and remote replication.

UNIT 5: STORAGE SECURITY AND MANAGEMENT **9**

Storage security framework, Storage security domains, security implementations in storage Networking; storage infrastructure management

Text Books:

1. EMC Corporation - **Information Storage and Management -** Wiley India, 2009.

References:

1. Robert Spalding - **Storage Networks: The Complete Reference -** Tata McGraw Hill , Osborne, 2003.
2. Marc Farley - **Building Storage Networks -** Tata McGraw Hill, Osborne, 2001.
3. Meeta Gupta - **Storage Area Network Fundamentals -** Pearson Education Limited, 2002.

Course Code	Course Title	L	T	P	C
MC13E19	WIRELESS APPLICATION PROTOCOLS	3	0	0	3

Course Rationale :

- To impart knowledge on Wireless Technology, WML Script functions, Wireless Application Protocol and its application areas.
- To enable the learner for aspiring careers in WAP related specialized software field.

Course Objectives:

At the end of this course, the learner is expected :

- To understand the concepts of Wireless Technology.
- To create WAP applications.
- To learn WML Script functions

UNIT 1: MOBILE INTERNET STANDARD **7**

What is so different about wireless?- Origins of WAP - Using current web technologies for wireless applications - Overview of WAP architecture – Components -Network Infrastructure Services - WAP architecture design principles-Relationship to other standards

UNIT 2: WML **5**

What is WML?- Getting started-Configuring web server - Phones and Emulators- Understanding WML Usage - WML overview- Creating first card - Building decks of cards - Using Basic navigation

UNIT 3: CREATING WAP APPLICATIONS **13**

Tag used in navigation - Using Phone buttons and function keys - Using Phone buttons and function keys - Using Phone buttons and function keys - Basic card output - Basic card output – Layout - Using images and icons - Using variables - Input with <input> - Input with <select> -Delivering data to applications

UNIT 4: WML SCRIPT **5**

WML Script Vs Java Script - WML Script Vs Java Script - WMLScript functions -WMLScript Libraries - Using Sample Applications

UNIT 5: PUSH MESSAGING, WTA AND SAMPLE APPLICATIONS **15**

Push messaging: Overview - Push Access Protocol - WAP Push Addressing - Push message -WTA: Overview - WTA Client framework -WTA Client framework - Sample Applications: User directory - E-Commerce

Text Books:

1. Ben Forta with Keith Lauver, Paul Fonte, Robert M. Juncker, Ronan Mandel and Dylan Bromby- **WAP Development with WML and WMLScript**- SAMS publications-2001.
2. Singhal .S,Bridgman.T, Suryanarayana.L, Mauney.D, Alvinen.J, Bevis.D, Chan.J, Hild.S- **WAP-The Wireless Application Protocol**-Pearson publications-2011.

References:

1. Steve Mann & Scott Sbihli- **Wireless Application Protocols**- Wiley Computer Publishing-2000.
2. S.Ruseyev- **WAP Technology and Applications**-Easwar Press, 2003.

Course Code	Course Title	L	T	P	C
MC13E20	DESIGN PATTERNS	3	0	0	3

Course Rationale:

- To introduce the concepts of design pattern
- To understand the origin, ethics and kind of Design Patterns.
- To frameworks and Catalogs for Patterns.
- To study of Advanced Patterns.
- To enable the learner for aiming careers in Data analysis.

Course Objectives:

At the end of this course**,** the learner is expected:

- To implement Design Patterns.
- To perform Frame Works.
- To identify different design from various system.

UNIT 1: INTRODUCTION TO DESIGN PATTERNS **7**

What is a Design Pattern? .Design Patterns in Smalltalk MVC - Describing Design Patterns.
The catalog of Design Patterns - Organizing the catalog - How Design Patterns solve design problems - How to select a Design Pattern - How to use a Design Pattern

UNIT 2: DESIGNING A DOCUMENT EDITOR **9**

Introduction to document editor - Design Problems - Document Structure - Formatting
Embellishing the user interface - Supporting multiple look-and-feel standards -Supporting multiple window systems - User operations - Spelling checking and hyphenation

UNIT 3: DESIGN PATTERN CATALOG **8**

Introduction to pattern catalog - Creational patterns - Abstract factory - Builder Factory method - Prototype Singleton - Discussion of creational patterns

UNIT 4: STRUCTURAL PATTERNS **9**

Introduction to structural patterns - Adapter Bridge - Composite Decorator - Façade – Flyweight Proxy - Discussion of structural patterns

UNIT 5: BEHAVIORAL PATTERNS **12**

Introduction to behavioral patterns - Chain of responsibility - Command, Interpreter - Iterator, Mediator - Memento, Observer - State, Strategy - Template method –Visitor - Discussion of Behavioral Patterns - Class diagram - Object diagram - Interaction diagram

Text Books:

1. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides - **Design Patterns -** International Student Edition, 1998.
2. Martin Fowler - **Analysis Patterns: Reusable Object Models -** Addition Wesley, 1997.

References:

1. Karen Gardner, Alex Rush, Bob Konitzer, Mike Crist and Bobbin Tee garden,- **Cognitive Patterns: Problem Solving Frameworks for Object Technology –** Cambridge University Press, 1998.
2. Doug Lea - **Concurrent Programming in Java: Design Principles and Patterns -** Addison, 1999.

Course Code	Course Title	L	T	P	C
MC1347	PERSONALITY DEVELOPMENT – III	2	0	0	2

Course Rationale:

- To improve the ability of the students to solve aptitude problems in Arithmetic and Mensuration.
- To introduce students to the nuances of vocabulary
- To enable students the art of writing resumes and give interviews

Course Objectives:

At the end of this course**,** the learner is expected :

- To adopt new technique in solving Arithmetic and Mensuration problems
- To enrich their ability to solve various company paper
- To prepare interviews with confidence

UNIT 1: ARITHMETIC **12**

Averages - Mixtures & Solutions - Time & Work - Pipes & Cisterns - Time, Speed Distances I - Time, Speed & Distances II - (Each session 2Hrs)

UNIT 2: MODERN MATHEMATICS & MENSURATION **12**

Data Sufficiency - Data Interpretation - Cubes - Mensuration – Clocks - Calendars –
(Each session 2Hrs)

UNIT 3: COMPANY PAPERS **6**

TCS Paper- Test & Discussion - Accenture Paper- Test & Discussion - Aricent Paper - Test & Discussion - (Each session 2Hrs)

UNIT 4: INTERVIEW SKILLS **10**

CV Writing - Self Profiling –Mock Interview (8 Hrs)

UNIT 5: VOCABULARY BUILDING **5**

One Word Substitution – Homonyms – Idioms - Phrasal Verbs - Odd Word
(Each session 1 Hr)

Text Books:

1. Abhijit Guha - **Quantitative Aptitude for Competitive Examination** 4th edition, Tata McGraw Hill Education, 2010.
2. R.S. Agrawal - **Quantitative Aptitude for Competitive Examination** - S.Chand Publishing, 2012.

References:

1. Arun Sharma - **Logical Reasoning -** Tata McGraw Hill, 2012.
2. Edgar Thorpe - **Test of Reasoning -** Tata McGraw Hill, 4th edition, 2007.
3. R.S. Agarwal - **Verbal & Non Verbal Reasoning -** S.Chand Publishing, 2012.
4. Oxford Dictionary of English Idioms, 3rd edition, Oxford University Press, New York, 2010.

Course Code	Course Title	L	T	P	C
MC1351	DATA MINING AND DATA WAREHOUSING	3	-	3	4

Course Rationale:

- To impart knowledge about Data Mining
- To know about various techniques used in Data Mining
- To design data warehouses for the companies
- To enable the learner for aiming careers in Data Warehouse Management

Course Objectives:

At the end of this course the learner is expected :

- To know the basic concepts of data mining
- To classify & cluster the data
- To use association rules on data.
- To introduce the concept of data warehousing
- To recover data in case of data loss.

UNIT 1: DATA MINING CONCEPTS & ARCHITECTURE 11

Introduction – Data Mining Definitions k-nearest neighbor-Data Mining Tools-Data Mining –Tools-Applications of Data Mining -Applications of Data Mining -Anatomy of Data Mining - Learning : types of learning -Machine learning-Knowledge: types of Knowledge-Knowledge discovery process-Knowledge discovery process-Architecture of Data Mining

UNIT 2: DATA MINING TECHNIQUES 10

Visualization Techniques – Likelihood & distance-Neural Networks-Decision Tree technique-Constructing decision trees-ID3 algorithm-Genetic algorithms: Crossover & mutation -Clustering: Distance function-K-means algorithm -Hierarchical Clustering - Applications -Association rules : Apriori algorithm.

UNIT 3: DATA WAREHOUSING CONCEPTS & ARCHITECTURE 8

Introduction - Goals- data warehouse users - Types of Data Warehouse-Data warehouse objects: fact table & Dimension table-Load Manager-Warehouse Manager-Query Manager-Data Warehouse Schemas : Star schemas-Snowflake Schemas.

UNIT 4 : DATA WAREHOUSE PARTITIONING & AGGREGATION 8

Horizontal Partitioning-vertical Partitioning-Hardware Partitioning-Hardware Partitioning-Software partitioning Methods-Aggregation-Designing Summary tables-Designing Summary tables

UNIT 5: DATA MARTS , META DATA , BACKUP & RECOVERY 8

Data Marts : Introduction-Estimating Design – Cost-Meta Data-Backup : Types of backup-Backup the data warehouse – SureWest Online Backup-Recovery : Strategies-various Testing Strategies-Various Recovery models, Disaster Recovery procedure

Text Books:

1. S. Prabhu , N. Venkatesan – **Data Mining & Warehousing** – New Age International – First Edition – 2006
2. Pieter Adriaans , Dolf Zantinge – **Data Mining** – Pearson education – 2005

References:

1. Sam Anahory , Dennis Murray – **Data Warehousing in real world** – Pearson Education – 2004.
2. Alex Berson, Stephen J.Smith – **Data Warehousing, Data mining & OLAP** – Tata McGraw Hill Publications – 2004.

Course Code	Course Title	L	T	P	C
MC1352	PHP PROGRAMMING	3	0	3	4

Course Rationale: To develop knowledge on Web platform development ,

- To develop knowledge on dynamic objects, Graphical, Database objects used in Web sites.
- To understand the advanced dynamic web page development.
- To enable the learner for aiming careers in PHP Programming and content management.

Course Objectives:

At the end of this course the learner is expected :

- To create dynamic Web pages and web platform Applications
- To create and to use Graphical, Database objects for interactive web applications such as Cloud solutions

UNIT 1: INTRODUCTION TO PHP 6

Comparative study of PHP (Advantage of PHP comparing with other web design tools)-History of PHP-Language basics, Lexical Structure -Different types of Variable with Example Scripts-The Usage of Functions in different place of scripts-Demonstration of Multiple Functions Multiple Arguments -Discussion on Advantage of PHP script

UNIT 2: POSSIBLE OPERATIONS, STATEMENT CONSTRUCTS, STRINGS, ARRAYS 10

Arithmetic, Logical Operations-Assignment, comparison operations-Conditional control statements general -syntax, Demo with example scripts -Syntax of Looping statements-Looping statements with example scripts.-Usage of Arrays in PHP scripts-Various String functions, String –comparisons-Encoding and Escaping strings and other special characters-Case study Customer Service feedback page-Continue the Design with elaborating PHP scripts

UNIT 3: FILE HANDLING WITH PHP 9

Creating: Opening and closing files-Writing a file-Logging -visitors details-Creating an upload form-Creating an upload script-confirming the file upload-Objects: Terminology – creating an object-accessing properties and methods, Data –persistence-Introducing a session-Exercise on session details.

UNIT 4: My SQL 9

Let the Data Drive-Good Things Come in Free Packages-New Functions-Setting up PHP to work with MySQL-Installing My SQL-Discussion on SQL Queries-Setting up a simple Database-Basic SQL Queries-Putting content into Database with PHP-Getting Content out of Database with PHP-Creating form with database connectivity using My SQL and PHP.

UNIT 5: ADDING GRAPHICS, PDF FILES, XML DOCUMENTING 11

User Authentication-Creating a User Table-Adding authorized users-Displaying authorized users-The user log-in form-The log-in form-handler script-An unauthorized log-in attempt-PDF extensions – Documents and pages-Text-images and graphics-Navigation in PDF files-other PDF features-XML-parsing-XML Transforming XML to XSLT.

Text Books:

1. Rasmus Lerdorf & Kevin Tatroe – **Programming PHP -** O'Reilly Media Inc 2006.
2. Christopher Cosentino - **Essential PHP for web professionals -** Pearson Education Asia, 2000.
3. Mike Mcgrath - **PHP Programming for Windows and LINUX in easy steps -** Wiley-Dreamtech India Pvt.Ltd., 2011.
4. Leon Atkinson with Zeev Suraski, **- Core PHP Programming -** Third Edition, Pearson Education Ltd., 2003.

References:

1. Toby Butzon - **PHP By Example -** Que Publications, 2001.
2. W.Jason Gilmore – **Beginning PHP and My Sql -** Third Edition, Apress, 2010.

Course Code	Course Title	L	T	P	C
MC1353	ADVANCED WEB TECHNOLOGY	3	0	3	4

Course Rationale:

- The purpose of this course on **MC0713 – ADVANCED WEB TECHNOLOGY** is:
- To learn all the techniques for AJAX
- To achieve secured, messaging through Web Services
- To enable the learners for aspiring careers in Web Technologies related development

Course Objectives:

At the end of this course the learner is expected :

- To describe the basic concepts of XML and Web Services
- To apply XML manipulation technologies such as XSLT, XPath, Xlink and XQuery
- To develop web services and ensure security To understand the need of AJAX and developing applications using AJAX controls
- To develop web services and ensure security

UNIT 1 : INTRODUCTION TO XML 6

Introduction to XML and its need-XML Revolution – Data Revolution-
XML Revolution – Architectural and Software revolution-The XML Technology family-Structure and data typing-The XML Technology family- Presentation Technologies-The XML Technology family- Manipulation Technologies.

UNIT 2 : XML PRESENTATION, MANIPULATION TECHNOLOGIES 11

XML Document rule-XML structuring rule and Related Data type-XML presentation – CSS-XML presentation – XSL-XML presentation – XSLT (operations)-XML presentation – XSLT (operations)-XML presentation – intro to XSL-FO-XML presentation – Forms-Uses of Voice XML with a block diagram-Discussion-Case Study.

UNIT 3: ASYNCHRONOUS JAVASCRIPT AND XML – AJAX 11

Introduction and Need for AJAX-AJAX Architecture-Ajax Web Application Model-Ajax control Toolkit-Ajax controls -1-Ajax controls -2-Ajax controls – 3-Ajax controls – 4-Ajax controls – 5-Announced Test.

UNIT 4: SOAP PROTOCOL & WEB SERVICES 10

Why SOAP & uses-Explanation on SOAP Protocol-Approaches to SOAP-SOAP Architecture-XML-RPC-Structure of HTTP Request-Introduction to SOAP faults-Concepts of SOAP Attachments-Introduction to Web Services-UDDI Model & Security on XML.

UNIT 5 : SEMANTIC WEB 7

Introduction to Semantic Web: Needs, Evolution. Types of Data etc.,-Levels of Semantics-The layered Architecture: URI, UNICODE, XML NS, RDF-The layered Architecture: Ontology, logic, proof, trust and Digital signature-Un-announced Quiz-Resource Description Framework (RDF)-Web Ontology Language (OWL).

Text Books:

1. Frank. P. Coyle - **XML, Web Services and the data revolution -** Pearson Education, 2002 (for I,II,III Units)
2. **Ajax – Black Book** New Edition – Kogent Solutions Inc - Dreamtech Press, 2008.
3. Grigoris Antoniou and Frank Van Harmelen,-**A Semantic Web Primer -** The MIT Press, Cambridge, Massachusetts London, England, 2004 (for V unit)

References:

1. Gavin Powel - **Beginning XML Databases** - Wrox Press, 2007 (for IV unit)
2. Ramesh Nagappan, Robert Skoczylas and Rima Patel Sriganesh, - **Developing Java Web Services** - Wiley Publishing Inc., 2004 (for IV unit)
3. Sandeep Chatterjee, James Webber, - **Developing Enterprise Web Services** -, Pearson Education, 2004 (for IV unit)

Course Code	Course Title	L	T	P	C
MC1354	SOFTWARE TESTING & QUALITY ASSURANCE	3	0	3	4

Course Rationale:

- To impart knowledge on the fundamentals of software testing and Quality assurance
- To provide a complete, comprehensive coverage of various software testing methods.
- To develop test cases using manual testing.
- To enable the learner to become a **Software Tester / Quality Assurance Member**

Course Objectives:

At the end of this course the learner is expected :

- To understand the Software Testing Concepts.
- To build knowledge in Software Quality Assurance concepts and Software Quality Control.
- To implement the Software Quality and Control Concepts
- To Design the Test cases and to get familiarity over Automated Testing tools

UNIT 1: THE PSYCHOLOGY AND ECONOMICS OF PROGRAM TESTING, TEST CASE DESIGN 9

Introduction to software testing-The Psychology of Testing-The Economics of Testing -Software Testing Principles-

Inspections and Walkthroughs-Code Inspections -An Error checklist for Inspections-White-box testing-Error guessing

UNIT 2: MODULE (UNIT) TESTING, HIGHER- ORDER TESTING & DEBUGGING 9

Test-Case Design - 1 -Test-Case Design – 2-Incremental Testing-Top-down versus Bottom- up Testing-Function Testing- System Testing -Acceptance Testing-Installation Testing-Debugging.

UNIT 3: THE REALITIES OF SOFTWARE TESTING & TESTING THE SOFTWARE 9

-SDLC Models -STLC Model -Software Testing Terms and Definitions-Testing Fundamentals-Dynamic Black-Box Testing – 1-Dynamic Black-Box Testing – 2-Equivalence Partitioning-Data Testing-State Testing.

UNIT 4: APPLYING TESTING SKILLS 9

Configuration Testing -Compatibility Testing-Usability Testing-Testing the Documentation-Testing the Documentation – 2-Web Site Testing – 1-Web Site Testing – 2-Testing for Software Security – 1-Testing for Software Security – 2.

UNIT 5: AUTOMATED TESTING AND TEST TOOLS & BUG REPORTING 9

- Automated Testing and Test Tools: -benefits-Test Tools-Software Test Automation-Bug Bashes and Beta Testing-Writing and Tracking Test Cases: Goals-Test Case Planning Overview-Bug's Life cycle-Bug-Tracking System-Software Quality Assurance.

Text Books:

1. Glenford J. Myers, - **The Art of Software Testing** - John Wiley &Sons, Second Edition, New Delhi, 2008.
2. Ron Patton - **Software Testing** - SAMS Techmedia Publication, Second Edition, 2007.

References:

1. William E.Perry, **Effective Methods for Software Testing,** John Wiley & Sons, Second Edition, 2000.
2. Boris Beizer, Black-Box Testing: -**Techniques for Functional Testing of Software and Systems,** John Wiley & Sons, 1995.

Course Code	Course Title	L	T	P	C
MC13E21	DISTRIBUTED OPERATING SYSTEM	3	0	0	3

Course Rationale:

- To understand the basic concepts of Distributed Operating System principles.
- To know the Distributed Computing techniques.
- To familiarize Synchronization and Shared Memory.

Course Objectives:

At the end of this course, the learner is expected:

- To provide in depth knowledge of challenges and issues of incorporating Distributed Operating System concepts.

- To provide roles performed by network administrator.
- To introduce several distributed systems operation and maintenance issues.
- To enable the learner for aiming careers in Testing Operating Systems under different software environments.

UNIT 1: INTRODUCTION & COMMUNICATION OF DISTRIBUTED SYSTEMS 9

Introduction & Goals - Hardware Concepts - Software concepts - Design issues - layered protocols - ATM Networks - client server model - Remote Procedure calls - Group Communication

UNIT 2: SYNCHRONIZATION IN DISTRIBUTED SYSTEMS 6

Clock synchronization - mutual exclusion - Election algorithms - Atomic transactions - Transaction model - Implementation and Concurrency control - Deadlocks

UNIT 3: PROCESSES AND PROCESSORS IN DISTRIBUTED SYSTEMS 9

Threads - Threads design issues and implementation - System models - processor allocation - Design & implementation issues - Example processor allocation algorithms and Scheduling
Fault tolerance –Types - Use of redundancy - Real time distributed systems - Real time Scheduling and communication

UNIT 4: DISTRIBUTED FILE SYSTEMS AND SHARED MEMORY 10

Distributed File Systems Design - DFS Implementation - Example DFS - Trends - Shared memory Introduction - Consistency models - Page-based distributed shared memory - Shared-variable distributed shared memory - Object-based distributed shared memory - Comparison

UNIT 5: CASE STUDY 11

Introduction to amoeba - Object and Capabilities - Process Management - Memory management - Group Communication – FLIP - Amoeba Servers - Introduction to MACH - Process Management - Memory management - Communication

Text Books:

1. Andrew S Tanenbaum **- Distributed Operating Systems** - Pearson Education,2001.
2. Mukesh Singal Niranjan G Shivrartri, -**Advanced Concepts in Operating Systems** - Mc Graw Hill International , 1994.

References:

1. Pradeep K Sinha - **Distributed Operating System: Concepts and Design** – Wiley Publications, 1996

Course Code	Course Title	L	T	P	C
MC13E22	ADVANCED DATABASE MANAGEMENT SYSTEMS	3	0	0	3

Course Rationale:

- To describe the basic concepts of Distributed Database and Parallel database Design
- To describe the design of Object Databases.
- To know how to design with DB and XML.
- To discuss the emerging Database Models Technologies and Applications
- To discuss about the database security.

Course Objectives:

At the end of this course, the learner is expected:

- To learn DBMS advanced features.
- To develop competence in enhancing database models using distributed databases.
- To implement and maintain an efficient database system using emerging trends.
- To enable the learner for aiming careers in Database Administration.

UNIT 1: DISTRIBUTED AND PARALLEL DATABASE 10

Architectural models for distributed DBMS - Distributed database architecture - Fragmentation and Allocation - objectives of Query processing - Characterization of query processing - Layers of query processing - Query optimization - Properties of transaction - Types of transaction - Deadlock management - Failures in distributed DBMS - Parallel architecture - Parallel DBMS techniques

UNIT 2: OBJECT ORIENTED DATABASE 9

OO concepts, object identity, object structure and Type constructors - Encapsulation of operations, Methods and persistence - Class hierarchies and Inheritance, overview of the object Model of ODMG - object definition language, Object query language - Object database conceptual design - SQL in object-relational features - Evolution of data models and current trends of database technology - Issues in OODBMS - The Nested Relational Model.Advantages and disadvantages in OODBMS

UNIT 3: ENHANCED DATA MODELS FOR ADVANCED APPLICATION 9

Active database concepts and triggers - Temporal database concepts - Spatial databases: concept and architecture - Deductive databases and query processing - Mobile databases - Multimedia databases - Geographic Information system - Introduction to cloud database - Characteristics of cloud database

UNIT 4: DATABASE ON THE WEB AND SEMI-STRUCTURED DATA 8

Structured, Semi structured data - Unstructured data - Web interfaces to the web - Overview of XML - Structure of XML data, Document Schema - Querying XML data - XML applications - The semi – structured data model

UNIT 5: DATABASE SECURITY 9

Introduction to database security - granting and revoking privileges - Mandatory Access control and role-based control for multilevel security - statistical database security - Encryption Techniques - Public key Infrastructures - Challenges of database security - Database security issues - Discussion

Text Books:

1. R. Elmasri, S.B. Navathe - **Fundamentals of Database Systems** - Fifth Edition, Pearson Education/Addison Wesley, 2007.
2. Thomas Cannolly and Carolyn Begg - **Database Systems, A Practical Approach to Design, Implementation and Management** - Third Edition, Pearson Education, 2007.
3. M. Tamer Ozsu, Patrick Ualduriel - **Principles of Distributed Database systems** - Second Edition, Pearson Education – 1999.

References:

1. Thomas M. Connolly, Carolyn E. Begg - **Database Systems – A practical Approach to Design, Implementation and Management** - 3rd Edition, Pearson Education, 2003.
2. C.S.R. Prabhu - **Object Oriented Database Systems** - PHI, 2003.
3. Vijay Kumar - **Mobile Database Systems** - John Wiley & Sons, 2006.

Course Code	Course Title	L	T	P	C
MC13E23	SOFTWARE PROJECT MANAGEMENT	3	0	0	3

Course Rationale:

- To demonstrate knowledge of project management test and techniques
- To participate activity or successfully manage a software development project by applying software management concepts

Course Objectives:

At the end of this course, the learner is expected:

- To gain knowledge on software management techniques, scheduling activities and Maintain software quality
- To understand the basic principles and concepts of software project management
- To pursue careers as module leader / project leader in IT companies.

UNIT 1: CONVENTIONAL SOFTWARE MANAGEMENT 11

Waterfall Model in theory - Waterfall Model in Practice - Conventional software management performance - Evolution of software economics - Pragmatic software an estimation - Improving software economics - Improving software processes - Improvement team effective - Principles of environmental software engineering - Principles of modern software management - Transition in to an iterative process

UNIT 2: SOFTWARE MANAGEMENT PROCESS FRAMEWORK 8

Life cycle initial phases - Life cycle final phases - Artifact sets of engineering & management - Artifact evolution over the lifecycle - Model based software architecture - Software process work flows - Major and minor milestones - Periodic states assessment

UNIT 3: SOFTWARE MANAGEMENT DISCIPLINES 12

Work break-down structures - Process Planning guidelines - The iteration planning process - Line of business organization - Evolution of organizations - Automation building blocks-tools - Change management environment - Stakeholder environments - The seven metrics - Management indicator from software projects - Quality indicators & metrics automation - Management different processes

UNIT 4: MODERN PROJECT PROFILES 9

Continuous Integration & risk resolution - Evolution any requirements - Top -10 software management principles - Software management best practices - Team work among stakeholders - Small scale projects - Large scale projects - Process maturity & architectural risks - Domain expertise & management

UNIT 5: NEXT GENERATION SOFTWARE ECONOMICS AND TRANSITIONS 5

Next Generation costing models - Modern software economics - Modern process culture shifts - Modern process development - The state of practice in software management

Text Books:

1. Walker Royce - **Software Project Management: A Unified Framework -** Pearson, 2000
2. Bob Hughes, Mike Cotterell, Rajib Mall – **Software Project Management -** Tata McGraw Hill Education Private Limited, 2009.

References

1. Ramesh Gopalaswamy - **Managing and global software Project -** Tata McGraw Hill, 2003.
2. Pankaj Jalote - **Software Project Management in Practice -** Pearson, 2002.
3. Kathy Schwalbe - **Information Technology Project Management -** Course Technology, 2005
4. Joel Henry - **Software Project Management: A Real-World Guide to Success -** Pearson, 2004.

Course Code	Course Title	L	T	P	C
MC13E24	ENTERPRISE RESOURCE PLANNING	3	0	0	3

Course Rationale:

- To understand the importance of Enterprise-wide systems to business operations
- To understand basic concepts, tools and techniques of Enterprise Resource Planning
- To understand the business model and implementation of ERP
- To use commercial ERP packages

Course Objectives:

At the end of this course, the learner is expected :

- To provide a basic understanding and knowledge of the Enterprise Computing techniques used in industries
- To analyze and propose IT solutions for the integration of business process throughout the enterprise
- To aim for careers in various ERP consultancies, ERP-support services and Software Developers

UNIT 1: INTRODUCTION TO ERP 8

Integrated Management Information - Seamless Integration, Supply Chain Management – Integrated Data Model & Technology - Evolution of ERP & Benefits of ERP - ERP and the Modern Enterprise - Principles and Significance of business engineering - Business engineering with information technology - ERP and Management Concerns

UNIT 2: BUSINESS MODELING AND IMPLEMENTATION FOR ERP 9

Building the Business model-I - Building the Business model-II - Entities forming data model – I - Entities forming data model – II - Role of Consultant, Vendors and Users - Customization and Precautions - ERP Implementation – methodology - ERP Post implementation options and issues - Guidelines for ERP Implementation

UNIT 3: ERP AND THE COMPETITIVE ADVANTAGE 7

ERP and competitive – strategy - Understanding the ERP markets - Order-winners and qualifiers for general category - Part – I -Order-winners and qualifiers for general category - Part – II - ERP role in gaining competitive advantage -Survey Literature – I - Survey Literature – II

UNIT 4: VARIOUS ERP DOMAINS 10

Introduction to ERP domains - MPGPRO system modules - Part – I -MPGPRO system modules -Part – II - IFS/Avalon- Industrial and financial systems - Baan IV and its applications - SAP and its goals - SAP applications – I - SAP applications – II -SAP business overflow with internet and intranet - The Road ahead in the future (Arrival of ERP3)

UNIT 5: ERP BUYING PROCESS & ERP CASE STUDIES 11

Market Dynamics and Competitive strategy -Planning and developing marketing strategies - ERP buying process - User Interface-Application Integration -ERP performance measures – I - ERP performance measures – II - ERP and out sourcing services - ERP life cycle and Indian market scenario - Case study on car manufacturing company - Case study on steel company - Case study on renewable energy and enterprise applications

Text Books:

1. Vinod Kumar Garg and N.K.Venkita Krishnan - **Enterprise Resource Planning - Concepts and Practice -** Prentice Hall of India, 1998.
2. N.Venkateswaran - **Enterprise Resource Planning -** Scitech Publications (India) Pvt. Ltd., 2008

References :

1. S.Sadagopan - **Enterprise Resource Planning -** Prentice Hall, 2001.
2. Bret Wagner - **Enterprise Resource Planning** - Third Edition Cengage Learing, 2008.
3. Alexis Leon - **Enterprise Resource Planning -** Tata McGraw Hill, 2003.
4. Jose Antonio Fernandz - **The SAP R/3 Handbook** - Tata McGraw Hill, 1998.
5. Brady, Monk, Wagner - **Concepts in Enterprise Resource Planning -** Thomson Asia, 2001

Course Code	Course Title	L	T	P	C
MC13E25	MANAGEMENT ACCOUNTING	3	0	0	3

Course Rationale:

- To familiarize basic concepts, techniques, methods and processes of Accounting,
- To equip with skills for analyzing and interpreting financial statements
- To gain exposure for decision making in Financial Accounting & Management through case studies

Course Objectives:

At the end of this course, the learner is expected:

- To get familiarity over financial accounting, costing and management accounting
- To apply the gathered domain knowledge in order to architect the computerized system on these areas
- To enable the learner for aiming careers as ERP consultant / MIS executive

UNIT 1: PRINCIPLES OF ACCOUNTING 10

Definition, Nature and scope of accounting - Accounting Principle - Basic Books of Accounting - Journals:rules of Debit and Credit, Compound Journal Entry - Ledger Posting -
Trial Balance - Trading Account: Profit and Loss Account - Balance Sheet - Adjustment entries - Depreciation provisions and reserves.

UNIT 2: RATIO ANALYSIS 9

Meaning and nature, objectives, limitation - Advantage of Financial Statement
Classification of Ratio - Ratio Analysis interpretation - Meaning of fund flow statement, Uses of fund flow statement - fund flow statement and income statement -Preparation of fund flow statement - Treatment of provision for Taxation and proposed Dividends.

UNIT 3: MARGINAL COSTING 9

Cost sheet, important and types of cost sheet - Nature and importance of marginal costing - Advantage and limitation - Break-even Analysis- Break-even points -Construction of break-event chart - Case study - Limitation and uses of break-event chart - Application of marginal costing techniques - Numerical problems.

UNIT 4: BUDGETARY CONTROL 9

Meaning of budget, control, budgetary control - Budgetary Control as a Management Tool - Limitation of budgetary control Fore cost and budgets - Classification of Budgets - Case budget, Sales budget, Flexible budget - Functional budget, Master budget - Inventory valuation - FIFO and LIFO Methods.

UNIT 5: INTRODUCTION TO COMPUTERIZED ACCOUNTING SYSTEM 8

Hardware, Software Requirement for Accounting software - Coding logic and codes requires - Database creation - Master file - Transaction file - Documents used for data collection - Process of different files - Report preparation.

Text Books:

1. SN Maheshwari and SK Maheshwari - **Accounting for Management** - I Edition Vikas Publishing House P Ltd, 2nd edition, 2011.
2. P.C Tulsian - **Financial Accounting** - Pearson 10th Edition 2012

References:

1. SK Bhattacharya, and John Dearden - **Accounting for Management Text & Cases** - II reprint Vikas Publishing House P Ltd., 2009
2. Dr VR Palanivelu - **Accounting for Management** - II edition, University Science Press, 2007.
3. RSN Pillai and Bagavathi - **Management Accounting** - 1st edition .S Chand and co., 2006.

Course Code	Course Title	L	T	P	C
MC1356	PERSONALITY DEVELOPMENT – IV	2	0	0	2

Course Rationale:

- To actively participate in Group Discussions
- To give effective interviews
- To write meaningful passages
- To solve case studies

Course Objectives:

At the end of this course**,** the learner is expected:

- To understand HR and Technical Interviews
- To improve the writing skills
- To enhance holistic development for improving employability skills

UNIT 1: INTERVIEW SKILLS – II **9**

Group Discussion - Mock Interview – II - Case Study

UNIT 2: WRITING SKILLS **9**

Creative Writing

UNIT 3: VOCABULARY ENHANCEMENT **9**

Verbal Aptitude (Revision)

UNIT 4: APTITUDE ENHANCEMENT I **9**

Numbers – Logarithm , Simple Equations- Averages – Percentage, Profit & Loss- Ratio & Proportions – Mixtures & Solutions – Time & Work – Time, Speed & Distance.

UNIT 5: APTITUDE ENHANCEMENT II **9**

Permutation & Combinations – Probability - Data Sufficiency & Interpretation- Mensuration – Clocks & Calender – Analytical Reasoning – Logical Reasoning.

Text Books:

1. Abhijit Guha - **Quantitative Aptitude for Competitive Examination -** 4th edition, Tata McGraw Hill education, 2010.
2. R.S. Agrawal - **Quantitative Aptitude for Competitive Examination -** S.Chand Publishing, 2012.

References:

1. Arun Sharma - **Logical Reasoning -** Tata McGraw Hill, 2012.
2. Edgar Thorpe - **Test of Reasoning -** Tata McGraw Hill, 4th edition, 2007.
3. R.S. Agarwal - **Verbal & Non Verbal Reasoning -** S.Chand Publication, 2012.
4. Barron's NEW GRE, 19th edition, Galgotia Publications Pvt. Ltd., New Delhi, 2012.
5. Barron's GMAT, 14th edition, Galgotia Publications Pvt. Ltd., New Delhi, 2007.
6. David Morley – The Cambridge Introduction to Creative Writing, Cambridge University Press, New York, 2007.
7. Madison Smartt Well – Narrative Define: The Writer's Guide to Structure, W.W. Norton & Co. Inc., 1997.
8. How to prepare for group discussion an interview, Hari Mohan Prasad & Rajnish Mohan, Tata McGraw Hill Publication Co. Ltd., New Delhi, 2005.

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