MSE-201 (SOFTWARE VERIFICATION VALIDATION AND TESTING)

UNIT-I
Software Testing Fundamentals –Testing objectives, Testing lifecycles, Test cases, human error, testing and debugging, general principles of testing, test metrics, Agile methodology and Its Impact on Testing, Verification and Validation. Failure, Error, Fault, and Defect

UNIT-II
Testing Approaches - Static testing, structured group examination static analysis, Control flow and data flow Testing, Determining Metrics, Dynamic Testing, Black Box testing, equivalence Class Partioning , Boundary Value Analysis, state transition test, cause effect graphing and decision table technique and used case testing and Advanced black box and white box techniques Gray box testing, intuitive and Experience based

UNIT-III
Software Reliability-Reliability models, Reliability measures, verification and validation planning, Top down versus bottom up Testing Functional Vs Structured Testing, mutation testing, Test planning and Management, Testing process, Maturity Models.

UNIT-IV
Types of Testing- Concept of Unit Testing, Domain testing, Concept of Integration Testing. System testing acceptance testing, Alpha &Beta testing, Installation Testing, Usability Testing, Regression testing, Performance testing, Load testing, Stress testing, Security testing, Gorilla testing, Syntax Based Testing .

UNIT-V
System Tests- Functionality Tests ,Robustness Tests, Interoperability Tests, Scalability Tests, Documentation Tests, Testing Tools-Automation of Test execution, Requirement Tracker, Win Runner, Load Runner, Test Director, Test Process , Test Plans ,

Reference Books:

1. Limaye , Software Testing , TMH Pub

2. Naik,Software Testing and Quality Assurance, Wiley India pub.

3. Ammann & Offutt, Introduction to Software Testing, Cambridge Univ Press

4. k.v.k.k.prasad, Software testing concepts Tools, Dreamtech press

MSE-202 (ADVANCE DISTRIBUTED SYSTEM)

UNIT-I
Introduction: Characterization of Distributed Systems - Examples - Resource Sharing and the Web -Challenges - System Models - Architectural and Fundamental Models - Networking and Internetworking - Types of Networks - Network Principles - Internet Protocols – Case Studies.

UNIT-II
Processes And Distributed Objects: Interprocess Communication - The API for the Internet Protocols - External Data Representation and Marshalling - Client-Server Communication - Group Communication- Case Study - Distributed Objects and Remote Invocation - Communication Between Distributed Objects - Remote Procedure Call - Events and Notifications - Java RMI -Case Study.

UNIT-III
Operating System Issues – I: The OS Layer - Protection - Processes and Threads - Communication and Invocation –OS Architecture - Security - Overview - Cryptographic Algorithms - Digital Signatures -Cryptography Pragmatics - Case Studies - Distributed File Systems - File Service Architecture - Sun Network File System - The Andrew File System

UNIT-IV
Operating System Issues – II: Name Services -Domain Name System - Directory and Discovery Services – Global Name Service - X.500 Directory Service - Clocks, Events and Process States - Synchronizing Physical Clocks - Logical Time And Logical Clocks - Global States - Distributed Debugging – Distributed Mutual Exclusion – Elections – Multicast Communication Related Problems.

UNIT-V
Distributed Transaction Processing: Transactions - Nested Transactions - Locks - Optimistic Concurrency Control - Timestamp Ordering - Comparison - Flat and Nested Distributed Transactions – Atomic Commit Protocols - Concurrency Control in Distributed Transactions – Distributed Deadlocks – Transaction Recovery - Overview of Replication And Distributed Multimedia Systems

Reference Books:

1. G Coulouris, J Dollimore, T Kindberg, Distributed Sys Concept- Design, Pearson

2. Sape Mullender, Distributed Systems, Addison Wesley,

3. A Fleishman, Distributed Systems- Software Design and Implementation, S Verlag

4. M.L.Liu, Distributed Computing Principles and Applications, Pearson Education

5. AS Tanenbaum, Maartenvan, Distributed System Principles Paradigms, Pearson

6. M Singhal, Niranjan, Shivaratri, Advanced Concept in Operating System, TMH

7. Flynn, Underatanding Operating System, Cengage (Thomson)

MSE- 203 (SOFT COMPUTING)

UNIT-I
Introduction of soft computing, soft computing vs hard computing. Soft computing techniques. Computational Intelligence and applications, problem space and searching: Graph searching, different searching algorithms like breadth first search, depth first search techniques, heuristic searching Techniques like Best first Search, A* algorithm, AO* Algorithms. Game Playing: Minimax search procedure, adding alpha-beta cutoffs.

UNIT-II
Fuzzy systems: Introduction, Need, classical sets (crisp sets) and operations on classical sets Interval Arithmetic ,Fuzzy set theory and operations, Fuzzy set versus crisp set, Crisp relation & fuzzy relations, Membership functions, Fuzzy rule base system

UNIT-III
Neural Network: Introduction, Biological neural network: Structure of a brain, learning methodologies. Artificial Neural Network(ANN): Evolution of, Basic neuron modeling , Difference between ANN and human brain, characteristics, McCulloch-Pitts neuron models, Learning (Supervised &Unsupervised) and activation function, Applications of Neural network.

UNIT-IV
Unsupervised learning in Neural Network: Counter propagation network, architecture, functioning & characteristics of counter Propagation network, Associative memory, hope field network and Bidirectional associative memory. Adaptive Resonance Theory: Architecture, classifications, Implementation and training. Introduction to Support Vector machine, architecture and algorithms, Introduction to Kohanan's Self organization map, architecture and algorithms

UNIT-V
Genetic algorithm: Introduction, working principle, Basic operators and Terminologies like individual, gene, encoding, fitness function and reproduction, Genetic modeling: Significance of Genetic operators, Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, GA optimization problems.

References:-

1. S.N. Shivnandam, "Principle of soft computing", Wiley India.

2. David Poole, Alan Mackworth "Computational Intelligence: A logical Approach" Oxford.

3. Russell &Yuhui, "Computational Intelligence: Concepts to Implementations", Elsevier.

4. Eiben and Smith "Introduction to Evolutionary Computing" Springer

5. Janga Reddy Manne; "Swarm Intelligence and Evolutionary Computing"; Lap Lambert Academic Publishing

MSE-204 (ADVANCE DATA STRUCTURES AND ALGORITHMS)

UNIT-I
Introduction: Basic Terminology, Data types and its classification, Algorithm complexity notations like big Oh, Array Definition, Representation and Analysis of Arrays, Single and Multidimensional Arrays, Address calculation, Array as Parameters, Ordered List and operations, Sparse Matrices, Storage pools, Garbage collection.

UNIT-II
Recursion:-Recursion- definition and processes, simulating recursion, Backtracking, Recursive algorithms, Tail recursion, Removal of recursion. Tower of Hanoi Problem. Linear Data Structure:- Stack, Array Implementation of stack, Linked Representation of Stack, Application of stack, Queue, Array and linked implementation of queues, Circular queues, D -queues and Priority Queues.

UNIT-III
Introduction of Linked list, Implementation of Singly Linked List, Two-way Header List, Doubly linked list, Linked List in Array. Generalized linked list, Non Linear Data Structure :-Trees: Basic terminology, Binary Trees, , algebraic Expressions, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees, Binary Search Tree(BST) , Height-balanced and weight-balanced trees, B-trees, B+ -trees.

UNIT-IV
Se arching, Sorting And Design Techniques: -Searching Techniques, Sorting-Internal Sorting, Bubble Sort, Insertion Sort, Quick Sort, Heap Sort, Bin Sort, Radix Sort, External Sorting, Merge Sort, Multi-way Merge Sort ,Design Techniques -Divide and Conquer, Dynamic Programming, Greedy Algorithm, Backtracking, Local Search Algorithms.

UNIT-V
Memory Management: -Issues -Managing Equal Sized Blocks, Garbage Collection Algorithms for Equal Sized Blocks, Storage Allocation for Objects with Mixed Sizes, Buddy Systems, Garbage collection and compaction.

Reference Books:

1. Aho, Hopcroft, Ullman, "Data Structures and Algorithms", Pearson Education P

2. Lipschutz; Data structure (Schaum); TMH

3. R. Kruse et al, "Data Structures and Program Design in C", Pearson Education Asia, Delhi-2002

MSE-205 (SOFTWARE PROJECT MANAGEMENT)

UNIT-I
Introduction to Software project Management: Software projects, Contract management and technical project management, Activities covered by software project management, key objectives of effective management, plans, methods & methodologies, problems associated with software projects management control.

UNIT-II
Project Planning: Business Planning: determining objectives; forecasting demand for product proposal writing requirement analysis, legal issues; Technical Planning: Lifecycle models, types of plans, plan documentation methods: PERT & CPM, Gantt charts, work breakdown structures. Standards, planning for risk management and control Capacity planning.

UNIT-III
Software Estimation Techniques, Expert judgment, estimating by analogy, Albrecht function point analysis, COSMIC Full Function Points, COCOMO-a parametric model. Risk Identification, Risk Assessment, Risk Planning & Risk Management, Evaluating risks to the schedule, Critical chain concepts.

UNIT-IV
Monitoring & Control: Creating the framework, collecting the data, Visualizing progress, Cost monitoring, Earned value analysis, Prioritizing monitoring, Change control. Managing people & organizing teams: Team organization, recruiting and staffing, Technical leadership, avoiding obsolescence training.

UNIT-V
Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions.
Case Study: The command Center Processing and Display system- Replacement (CCPDS-R)

Reference Books:

1. Bob Hughes and Mike Cotterell, Software Project Management, Tata McGraw-

   Hill Edition.

2. Thayer, Software Engineering Project Management, 2ed, wiley India

3. Conway, Software Project Management, Wiley India

4. Pankaj Jalote, Software Project Management in practice Pearson Education.