

NEW SYLLABUS FOR
M. SC.
COMPUTER SCIENCE
CHOICE BASED CREDIT SYSTEMS (CBCS)
FOR ADMISSION BATCH-2018



BHADRAK AUTO. COLLEGE,
BHADRAK

MASTER OF SCIENCE IN COMPUTER SCIENCE								
Examination Course Structure for M.Sc. C.S.								
SEMESTER-1			Mid Semester		End Semester			
SL.No	Paper Code	Paper Name	Internal Marks	Time	External Marks	Time	Total	Credits
1	MSC -101	Discrete Mathematical Structures	20	1hrs	80	3hrs	100	4
2	MSC -102	Computer Architecture	20	1hrs	80	3hrs	100	4
3	MSC -103	Object Oriented Programming using C++	20	1hrs	80	3hrs	100	4
4	MSC -104	Theory of Computation	20	1hrs	80	3hrs	100	4
5	MSC -105	Advanced Database Management Systems	20	1hrs	80	3hrs	100	4
Practical		[viva-voice(25) + Record(25)+ Written(25)+ Practical(25)]						
6	MSC -106	Object Oriented Programming using C++ Lab			100		100	2
7	MSC -107	Advanced Database Management Systems Lab			100		100	2
					Total Credits			24
SEMESTER-2								
1	MSC -201	Advanced Data Structure	20	1hrs	80	3hrs	100	4
2	MSC -202	Advanced Operating System	20	1hrs	80	3hrs	100	4
3	MSC -203	Software Engineering	20	1hrs	80	3hrs	100	4
4	MSC -204	Computer Graphics	20	1hrs	80	3hrs	100	4
5	MSC -205	Java Programming	20	1hrs	80	3hrs	100	4
Practical		[viva-voice(25) + Record(25)+ Written(25)+ Practical(25)]						
6	MSC -206	Advanced Data Structure Lab			100		100	2
7	MSC -207	Java Programming Lab			100		100	2
					Total Credits			24
SEMESTER-3								
1	MSC -301	Compiler Design	20	1hrs	80	3hrs	100	4
2	MSC -302	Design and Analysis of Algorithms	20	1hrs	80	3hrs	100	4
3	MSC -303	Advanced Computer Network	20	1hrs	80	3hrs	100	4

4	MSC -304	Elective-I	20	1hrs	80	3hrs	100	4
5	MSC -305	Elective-II	20	1hrs	80	3hrs	100	4
Practical		[viva-voice(25) + Record(25)+ Written(25)+ Practical(25)]						
6	MSC -306	Advance Java Lab			100		100	2
7	MSC -307	Computer Networking Lab			100		100	2
					Total Credits			24
Elective-I								
1		Optimization Techniques						
2		Digital Image Processing						
3		Cloud Computing						
4		Geographic Information System						
Elective-II								
1		Artificial Intelligence						
2		Cryptography and Network Security						
3		Big Data Analysis						
4		Soft computing						
SEMESTER-4								
1	MSC-401	Project Work [Project work(100)+viva(50)+presentation(50)=200]			200		200	8
					Total Credits			8
TOTAL CREDITS OF ALL THE SEMESTER								80

FIRST SEMESTER

MSC -101 Discrete Mathematical Structures [DMS] [CREDITS-4]

[MARKS 20+80=100]

Unit I

Logic: Fundamentals of logic, Logical inferences, Methods of proof of an implication, First Order Logic and other methods of Proof, Rules of Inference for quantified Propositions, Mathematical induction.

Unit II

Relations and Diagrams : Relations and Directed Graphs special Properties of Binary Relation, Equivalence Relations, Ordering Relations, Lattices and Enumerations. Operations on Relations, Paths and Closures, Directed Graphs and Adjacency matrices

Unit III

Graphs: Basic Concepts, Isomorphism and Subgraphs, Trees and their Properties, Spanning Trees, Directed Trees, Binary Trees, Planar Graphs, Euler's Formula, Multi Graphs and Euler Circuits, Hamiltonian Graphs.

Unit IV

Boolean algebra: Introduction to Boolean algebra, Boolean Functions, Switching Mechanisms, Minimization of Boolean Functions.

Reference Books:

1. Discrete Mathematics for Computer Scientists & Mathematics J. Mott, A. Kandel, T. P. Baker PIII (1999) [Chapters 1.5-1.10,4.1-4.7,5.1-5.10,6.1-6.5]
2. Discrete Mathematical Structures for Computer Science, Bernard Kolman, Robert C. Busby, Saaron Ross, PIII (1999) [Chapters 9.1,9.2,9.4,10.3,10.6]

MSC - 102 Computer Architecture [CA] [CREDITS-4]

[MARKS 20+80=100]

Unit I

Information Representation: Number systems, Binary numbers, Sign Magnitude & 2s complement representation. Fixed and Floating point, IEEE-754 Single Precision format, IEEE-754 Double Precision format, Floating-Point Arithmetic, IEEE Standard for Binary Floating-Point Arithmetic, Precision and range, BCD code, ASCII and EBCDIC

Digital Electronics: Boolean algebra, Logic gates, Truth Tables, Combinational circuits, Karnaugh map, Flip-flops, Sequential circuits

Unit II

Combination RTL Components : Integrated circuits, Multiplexer, Demultiplexers, Decoder, Encoder, Registers, Shift Registers, Binary Counters, Memory Unit - RAM, ROM. Parity generators and checkers, Error detection and correction : Hamming Code, Binary Adder-Subtractor, Decimal adder, Binary multiplier, magnitude comparator, Programmable Logic Devices- PLA, PAL, ROM. Sequential RTL components : Registers counters

Unit III

Central Processing Unit : General Register Organization, Stack Organization, Machine Language instructions, Addressing modes, Instruction formats, Instruction set selection, Instruction cycle and execution cycle, RISC vs CISC, Instruction Pipelining

Unit IV

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, external memory, Direct Memory Access.

Multiprocessors: Characteristics of Multiprocessors, Interconnection Structures: Time shared common bus, Multiport memory, Crossbar switch, Multistage switching network, Hypercube system. Interprocessor Arbitration, Interprocessor communication and Synchronization, Cache Coherence

Text Books:

1. Mano M, Computer System and Architecture (3rd Ed) (PHI)
2. J.L.Hennessy&D.A.Patterson –Computer Architecture –A Quantative approach 2nd Edition –Mergan Kaufman Pub –1996
3. V.C.Hammacher, Z.G.Vranesic, S.G.ZAky – Computer Organization McGraw Hill 1996

Reference Books:

1. K.Hwang –Advanced Computer Architecture, McGraw Hill, 1993
2. D.Sima, T.Fountation, P.Kacsak – Advanced Computer Architecture – A design space Approach, Addison Wesley, 1997

MSC -103 Object Oriented Programming using C++[OOP] [CREDITS-4]

[MARKS 20+80=100]

Unit I

Introduction to object oriented Programming, Features of OOPS. Getting started with C++ Data type, variables, expression, control structure, Concept of reference variable, I/O Stream class. Function: Definition, parameter passing, references, inline function, function overloading, function with arguments and reference, returning by reference.

Unit II

Class: Structure and class comparison Classes & objects , private, public & protected access specifiers, data member and member function , static data member & member function, inline function ,friend function, constructor, types of constructor, destructor.

Unit III

Dynamic memory management (new and delete), pointer to object. Inheritance: What is inheritance? Types of inheritance, Member accessibility, function overriding, derived class by derived by different access specifiers, multipath inheritance and pointer to objects in inheritance. Polymorphism: Run time polymorphism & virtual function, abstract class, object slicing.

Unit IV

Operator Overloading: Overloading of unary & binary operators, overloading using member function & friend function, overloading of Stream operator, Copying object, Type Conversion –Class to basic conversion, basic to class conversion. Exception Handling - Exception and derived classes, try, catch, throw statement, catching all exception, unexpected exception, re-throwing an exception.

Reference Books:

1. A.N. Kamthane, "Object Oriented Programming Education.
2. E. Balguruswamy, "Object Oriented Programming with C
3. K.R.Venugopal, Rajkumar,,TRavishankar, "Mast

MSC -104 Theory of Computation [TC] [CREDITS-4]

[MARKS 20+80=100]

Unit I

Introduction to finite automata, Central concepts of automata theory, Informal picture of finite automata, Deterministic finite automata, Non-deterministic finite automata, Application, Formal Language

Unit II

Regular expressions, Finite automata and Regular expressions, Applications of regular expressions, Algebraic laws of regular expressions, Pumping Lemma and its application for regular languages, Closure and Decision properties of regular languages

Unit III

Context-Free Grammars, Parse trees, Ambiguity in Grammar & Languages, Pushdown automation. The language of PDA, Equivalence and of CFGPDA, Deterministic pushdown automata, Chomsky Normal form, The pumping Lemma for context free languages, Decision properties of CFL's

Unit IV

The Turing machine, Programming techniques for Turing machines, Extension to the basic Turing machine, Restricted Turing machine, Turing machines and computers.

Text Books

1. Introduction to Automata Theory, Languages and Computation- J.Hopcroft, R.Motwani, J.D.Ullman –Pearson Education
2. Mishra, Chandrashekharan, "Theory of Compute

Reference Books

1. Introduction to Theory of Computation –M.Siper, Thomson Learning
2. P. Linz, "An Introduction to formal Language
3. LewishPapadimitra: theory of Computations, Prentice Hall of India, New Delhi

MSC -105 Advanced Database Management Systems [ADBMS]

[CREDITS-4]

[MARKS 20+80=100]

Unit 1

Introduction: Introduction to File and Database systems- History- Advantages, disadvantages- Data views –Database Languages –DBA –Database Architecture –Data Models -Attribute types – Keys -ER diagram–EER Diagram- Overview of Network and Hierarchical models.

Unit 2

Relational Model: The relational data model, Relational constraints, Relational calculus. The domain relational calculus, Relational algebra .ER and ERR to relational mapping

Query languages –SQL –Data definition –Queries in SQL –SQL: Basic queries .Complex queries, Insert delete and update statement in SQL, Views, Constraints and assertion, Updates

Unit 3

Database Design: Design Phases –Pitfalls in Design –Functional Dependence –Amstrong Axioms, Normalization (1NF, 2NF, 3NF, BCNF, 4NF, 5NF).

Unit 4

Transaction Management: Transaction concept –state- Serializability –Recoverability-Concurrency Control –Locks- Two Phase locking –Deadlock handling–Time stamp ordering, File Organization –Organization of Records in files –Indexing and Hashing.

Query processing and Optimization: Basic algorithms for Query operations, Using heuristics selectivity & cost estimates in query optimization, semantic query optimization.

Text Book:

1. Rameez Elmasri, Shamkant B. Navathe, „Funda Ed., Pearson Education, 2009.

Reference Book:

1. Philip J. Pratt, Joseph J Adamski, „Database Learning, 2009.
2. Abraham Silberschatz, Henry F. Korth & S. Concepts“, McGraw Hill, International Edition ,
3. Arun K Majumdar, Pritimoy Bhattacharyya, 2009 ISRD group, „Introduction to Database Management
4. Raghu Ramakrishnan, Johannes Gehrke, „Data McGraw Hill ,International Edition, 2003.
5. Ramon A Mata-Toledo, Pauline K Cushman, „Database Management Systems“, TMH, 2008.

MSC -106 Object Oriented Programming using C++ Lab[OOPL][CREDITS-2]

[MARKS=100]

1. Implementing classes and creation of objects.
2. Checking Precedence of operators & side effects.
3. Implementing various control structures & loops.
4. Making structured programming & stepwise refinement.
5. Implementing Procedural abstraction with functions.
6. Implementing Constructors and destructors.
7. Implementing Data abstraction & inheritance.
8. Implementing Multiple & hybrid inheritance.
9. Implementing Polymorphism concepts.
10. Implementing Operator overloading & friend's
11. Working with new & delete, object copying.
12. Implementing Object slicing, this operator.
13. Exception handling mechanisms.
14. Implementing class templates & function templates.
15. Creating files in C++ and file related operations.

MSC -107 Advanced Database Management Systems Lab[ADBMSL] [CREDITS-2]

[MARKS=100]

1. Learning basic DDL and DML commands
2. Learning basic DCL and TCL commands.
3. Insertion, Deletion, Updating to a table using SQL commands
4. Working with dual table.
5. Data retrieval using Select & where clause.
6. Oracle inbuilt functions-Date, aggregate, group by etc.
7. Use of Joins and Sub queries.
8. Views, sequences and indexes.
9. Managing users, privileges and roles.
10. PL/SQL-Data types, control structures.
11. Creating procedures with PL/ SQL.
12. Error handling in PL/ SQL.
13. Cursor Management in PL/ SQL.
14. Writing Programs on Packages & triggers.

SECOND SEMESTER

MSC -201 Advance Data Structure [ADS] [CREDITS-4]

[MARKS 20+80=100]

Unit-1 INTRODUCTION AND OVERVIEW

Introduction, Basic Terminology; Elementary Data Organization, Data Structures, Data Structure Operations, Algorithms: Complexity, Time-Space Tradeoff, Solved problems. Control structures, Complexity of Algorithms, ARRAYS : Linear Arrays, Representations of Linear Arrays in Memory, Traversing Linear Arrays, Inserting and Deleting, Multidimensional Arrays, Pointer; Pointer Arrays,

Unit-2 LINKED LISTS

Introduction, Linked lists, Representation of Linked Lists in Memory, Traversing a Linked List, Searching a Linked List, Memory Allocation; Insertion into a Linked List, Deletion from a Linked List, Header Linked Lists, Two-way List

Unit-3 STACKS, QUEUES

Introduction, Stacks, Array Representation of Stacks, Lined Representation of Stacks, Arithmetic Expression, Polish Notation, An Application of Stacks, Queues, Linked Representation of queues, Deques, Priority Queues.

Unit-4 TREES, SORTING AND SEARCHING

Introduction, Binary Trees, Representing Binary Trees in Memory, Traversing Binary Trees, Traversal Algorithms Using Stacks ,B Trees, Searching, Inserting and Deletion in a B-Tree, Introduction, Sorting, Insertion sort, Selection Sort, Bubble sort, Counting sort, Radix sort, Searching, Linear Search, Binary Search.

Text Books:

1. Mark Allen Weiss, —Data Structures and Algorithm Education, 2002.
2. Aho Hopcroft Ullman, —Data Structures and Algorithm
3. Data Structure, Schaumi Outlines, Author-Seymour Lipchitz, McGraw Hill
4. Data Structure using C & C++, Authour-Yedidyah Lancsam, M J Augenstein, Aaron M Tenebaum, PHI

MSC -202 Advance Operating System [AOS] [CREDITS-4]

[MARKS 20+80=100]

Unit I

Operating System, Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, Special Purpose Systems, Computing Environments, Open-Source Operating Systems. Operating System Services, User Operating System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating System Structure, Virtual Machines, Operating System Debugging, Operating System Generations. System Boot.

Unit II

Process: Process Concept, Process Scheduling, Operations on Processes, Inter-Process Communication, Examples of IPC Systems, Communication in Client-Server Systems
Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Process synchronization: Background, Critical section problem, Semaphore, Overview of classical synchronization problem: The Bounded-Buffer problem, The Reader-Writers Problem, The Dining -Philosopher Problem, Monitors.

Unit III

Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock avoidance, Deadlock Detection, Recovery from Deadlock.
Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation.

Unit IV

Virtual-Memory Management: Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory. File System: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection.

Text Books:

1. Abraham Silberschatz and Peter Bear Galvin, "Operating System Concepts", Addison Wesley.
2. Mukesh Singnal and Niranjana G. Shivaratri , Advanced Concepts in operating System, TMH.

Reference Books:

1. Milan Milenkovic, System Concepts & Design, TMH
2. H.M. Beitel, Operating System, Pearson.
3. Andrew, S Tannenbaum , "Operating System", PHI

MSC -203 Software Engineering [SE] [CREDITS-4]

[MARKS 20+80=100]

Unit I

Introduction to software Engineering: Basic concepts about software and program and Evolution of Software Engineering, Basic concepts on process and life cycle models. Models: Waterfall, Prototype, Evolutionary, Incremental, Spiral, V Model, RADM.

Unit II

Requirements Engineering, Functional and Non-Functional Requirements, The Software Requirements Document, Requirements Specification, Software design: Methods and strategies, desirable design attributes, Concept of good design, Cohesion and coupling.

Unit III

Function-Oriented Software Design: Structured system analysis and structured design, formal approach design, data flow oriented design. Software Coding and Testing: Coding Standard and Guidelines, Code Review, Software Inspection, Testing: Unit, Integration, System Testing, Black box and White box testing, Incremental Testing, Formal Proof of Correctness, Software Matrix. Introduction to Software Verifications.

Unit IV

Overview of Object Oriented Concepts: Basic mechanisms, Key concepts, related technical terms, Advantages of OOD. Object oriented vs. function-oriented design, Object oriented modelling.

Context Models, Interaction Models, Structural Models, Behavioural Models, Model-Driven, Engineering, Architectural Design, Architectural Design Decisions, Architectural Views, Architectural Patterns, Application Architectures.

Software Reliability and Quality Management: S/W and H/W Reliability, Reliability Matrices, S/W Quality,

Reference Books:

1. Rajib Mall, "Introduction to S/W Engineering", PHI.
2. Rohit Khurana, "Software Engineering Principles and Practices" 2nd Ed.
3. R.S. Pressman, "Software Engineering, A practitioner's approach", McGraw Hill.
4. Grady Booch, Rumbaugh, Ivar Jacobson, "Unified Modeling Language", User Guide Pearson.
5. H. Srimathi, H. Sriram, A. Krishnamurthy, Scitech, "Object Oriented Analysis & Design Using UML"
6. Craig Larman, "Applying UML and Patterns".
7. Satzinger, Jackson, "Object-Oriented Analysis and Design" "Object with the Unified Process" Cengage Learning.

MSC -204 Computer Graphics [CG] [CREDITS-4]

[MARKS 20+80=100]

Unit I

A survey of computer graphics: Computer Aided Design, Presentation graphics, Computer Art, Entertainment, Education and training, Visualization, Image processing, Graphical User Interfaces.

Overview of graphics Systems: Video display devices, Raster Scan Displays, Random Scan Displays, Input devices, Hard-copy devices, Graphics software. Output Primitives: Points and Lines, Line drawing Algorithms (DDA and Bresenham's Line algorithm), Mid-point circle algorithm, Ellipse generating algorithms, Filled-Area Primitives. Attributes of Output Primitives: Line Attributes, Curve Attributes, Color and Grayscale Levels, Area-Fill Attributes and Character Attributes, Bundled attributes and anti-aliasing.

Unit II

Two dimensional geometric Transformation: Basic Transformation(Translation, Rotation, Scaling), Matrix representation and Homogenous Coordination, Composite Transformation, Reflection Shear, Transformation between coordinate systems, Two dimensional viewing: The Viewing Pipeline, Viewing coordinate reference frame, window to viewport coordinate transformation, Line Clipping: (Cohen-Sutherland & Liang-Barsky algorithm) and Polygon Clipping (Sutherland-Hodgeman Algorithm).

Unit III

Three dimensional object Representation: Polygon Surfaces, Quadratic Surfaces, Spline Representation, Beizer Curves and Surfaces, B-Spline Curves and Surfaces, Fractal Geometry Methods: Fractal Generation Procedures, Classification of Fractals, Fractal Dimension, Geometric Construction of Deterministic Self Similar Fractals, Self Squaring fractals.

Unit IV

Three Dimensional Geometric and Modeling Transformations: Translation, Rotation, Scaling. Reflections, Shears, Composite Transformations, Modeling and coordinate Transformations.

Three Dimensional Viewing: Viewing Pipeline, Viewing Coordinates, Projections (Parallel and Perspective) Clipping. Visible Surface Detection Methods: Classification of Visible-Surface Detection Algorithms, Back-Face Detection, Depth-Buffer Method, A-Buffer Method, Scan line and Depth Sorting,

Text Books:

1. Donald Hearn & M. Pauline Baker, "Computer Graphics 2004, Pearson Education, Inc. New Delhi.

Reference Books:

2. J.D. Foley, A.Dam, S.K. Feiner, J.F. Hughes: Computer Graphics Principle and Practice Addison Wesley.

MSC -205 Java Programming [JP] [CREDITS-4]

[MARKS 20+80=100]

Unit I

Introduction to Java Programming Language, Data Types and Operations, Structured Programming, Selection Statements, Loops, Methods, Method Abstraction and Stepwise Refinement, Arrays, Object-Oriented Programming: Classes and Objects, Constructors, Implementing & Designing Classes.

Unit II

Use of Keywords: static, final, this, Class Abstraction and Encapsulation, Strings and Text I/O, Inheritance and Polymorphism, use of super keyword, Overriding vs. Overloading, Abstract Classes and Interfaces, Packages, Object-Oriented Design and Patterns.

Unit III

GUI Programming: GUI Basics, Graphics, Event-Driven Programming, Creating User Interfaces, Applets and Multimedia, Exception Handling, Binary I/O.

Unit IV

Files & Streams, Recursion, Dynamic Binding, Generics & Generic Programming, Java Collections Framework, .Multithreading, Networking, JDBC, Internationalization.

Reference Books:

1. Y. Daniel Liang, "Introduction to Java Programming: Comprehensive Version", 7th Edition, 2009, Pearson Education Inc., New Delhi. (Book Chapters: 1 to 24, 26, 29 to 37)
2. Herbert Schildt, "Complete edition, TMH, reference New York of Java"
3. Richard A. Johnson, "An Introduction to Java Programming and Object Oriented Application Development", First Edition, 2007, CENGAGE L New Delhi.
4. E. Balagurusamy, "Programming with Java: A Primer", 3rd Edition, 2008, McGraw-Hill Education (India), New Delhi.
5. Harvey M. Deitel & Paul J. Deitel, "Java: How to Program", 8th Edition, 2009, PHI Learning Pvt. Ltd., New Delhi.
6. Mahesh P. Bhavre & Sunil A. Patekar, "Programming with Java", First Edition, Pearson Education, Inc. New Delhi.

MSC-206 Advance Data Structure Lab [ADSL] [CREDITS-2]

[MARKS =100]

1. Matrix Operations-Add, Multiply, Rank, Det.etc.
2. Stack & Queue operations using Arrays.
3. Self-referential structures & single linked list operations.
4. Implementing Stack and queues using linked lists.
5. Implementing Polish Notations using Stacks.
6. Circular and double linked list operations.
7. Implementing priority queue & dequeue using lists.
8. Evaluating polynomial operations using Linked lists.
9. Implementing set related operations & Hashing.
10. Linear & binary search, bubble sort technique.
11. Insertion sort, selection sort & merge sort techniques.
12. Quick sort, counting sort and Shell sort techniques.
13. Radix (bucket) and address calculation sort methods.
14. Binary tree traversals (preorder, inorder, postorder).
15. Heap sort & AVL tree implementations.
16. Graph representation with matrix & adjacency lists.

MSC -207 Java Programming Lab [JPL][CREDITS-2]

[MARKS =100]

1. Introduction to java, Compiling & executing a java program.
2. Program with data types & variables.
3. Program with decision control structures: if, nested if etc.
4. Program with loop control structures: do, while, for etc.
5. Program with classes and objects.
6. Implementing data abstraction & data hiding.
7. Implementing inheritance.
8. Implementing and polymorphism.
9. Implementing packages.
10. Program with modern features of java.
11. Implementing interfaces and inner classes
12. Implementing wrapper classes
13. Working with files.
14. Working with AWT
15. Working with JDBC

THIRD SEMESTER

MSC - 301 [Compiler Design] [CD] [CREDITS-4]

[MARKS 20+80=100]

Unit -1

Introduction: Overview and phases of compilation.

Non-deterministic and deterministic finite automata (NFA & DFA), Conversion of NFA to DFA Classification of grammars, regular grammar, regular expressions and regular languages, Context free grammars, ambiguous grammar

Unit -2

Scanners: Top down parsing, LL grammars, Bottom up parsing, Polish expressions. Operator precedence grammar, LR grammars, Comparison methods Error handling

Unit-3

SLR parsers and construction of SLR parsing tables, LR(1) parsers and construction of LR(1) parsing tables, LALR parsers and construction of efficient LALR parsing tables, parsing using ambiguous grammars

Symbol table handling techniques, Organisation for non-block and block structured languages

Unit – 4

Syntax Directed Translation: Syntax directed definitions (SDD), inherited and synthesized attributes, dependency graphs, semantic rules, application of syntax directed translation.

DAG for expressions, three address codes - quadruples and triples, types and declarations, translation of expressions, array references, type checking and conversions, translation of Boolean expressions and control flow statements, back patching, intermediate code generation for procedures.

Run time storage administration, Static and Dynamic allocation, Intermediate forms of source program, Semantic analysis and code generation.

Reference Books:

1. A.V. Aho, R. Sethi & J.D. Ullman "Compilers Principles Techniq
Pearson Education
2. Kenneth C. Louden "Compiler Construction Pri
Learning Indian Edition.

MSC- 302 Design and Analysis of Algorithm [DAA] [CREDITS-4]

[MARKS 20+80=100]

Unit I

Introduction to design and analysis of algorithms, Growth of functions, Recurrences, Solution of recurrences by Substitution, Recursion tree and Master method, Worst case analysis of Merge sort, Quick sort and Binary search

Heapsort: Heaps, Building a heap, The Heapsort algorithm, Priority Queue, Lower bounds for sorting

Unit II

Dynamic Programming: Matrix-chain multiplication, Elements of dynamic programming, Longest common subsequence

Greedy Algorithms: An activity- selection problem, Elements of greedy strategy, Fractional knapsack problem, Huffman codes

Unit III

Data structures for Disjoint Sets: Disjoint set operations, Linked-list representation of disjoint sets, Disjoint-set forests.

Graph Algorithms: Elementary Graph Algorithms: Representations of graphs, Breadth-first search, Depth-first search, Minimum Spanning Trees: Kruskal and Prim's algorithms, Single-Source Shortest Paths: The Bellman-Ford and Dijkstra's algorithm, All-Pairs Shortest Paths: The Floyd-Warshall Algorithm

Unit IV

Maximum Flow: Flow Networks, The Ford-Fulkerson method, Polynomials and the FFT: Representation of polynomials, The DFT and FFT.

NP-Completeness: Polynomial time, Polynomial-time verification, NP-completeness and reducibility, NP-completeness proofs, NP-completeness problems.

Reference Books:

1. Introduction to Algorithms: T. H. Cormen, C. E. Leiserson, R. L. Rivest (PHI), Second Edition.
2. E. Horowitz, S. Sahani, S. Rajsekharan, "Fun Second Edition, Universities Press, 2007
3. Algorithm Design –Goodrich, Tamassia, Wiley India.
4. Algorithms By Sanjay Dasgupta, Umesh Vazirani –McGraw-Hill Education

MSC-303 Advanced Computer Network [ACN] [CREDITS-4]

[MARKS 20+80=100]

Unit I

Introduction: Data Communication, Network Protocols and Standards, Point to Point and Multi Point line configuration, Network Topologies: Mesh, Star, Tree, Bus, Ring.
Transmission Modes: Simplex, Half Duplex, Networks: LAN, MAN, WAN. The OSI Models: Function of Layers. TCP/ IP Protocol Suite.
Signals: Analog and Digital signals, Periodic and Aperiodic signal,
Encoding and Modulating: Digital to Digital conversion. Unipolar. Polar Bipolar, Analog to Digital conversion AM, FM, PM

Unit II

Transmission of Digital data: Parallel and Serial transmission. DTE/DCE interface, Modems, Guided and Unguided transmission media. Transmission impairment, Performance
Multiplexing: Frequency division, Wave division and Time division multiplexing, the Telephone system, Digital Subscriber Line (DSL), Error Detection and Correction: Types of Error, Redundancy Checks (VRC, LRC, CRC), Error Correction

Unit –III

Data Link Control: Line Discipline, Flow Control, Error Control
Data Link Protocol: Asynchronous and Synchronous Protocols, Character and Bit Oriented Protocols.
Local Area Networks: IEEE 802 standards, Ethernet, Token Bus, Token Ring, FDDI Switching:
Circuit Switching, Packet Switching, Message Switching

Unit IV

Integrated Services Digital Network (ISDN), Services, History, Subscribers access to ISDN, The ISDN layers, Broadband ISDN, Frame Relay: Introduction, Frame Relay operation. Frame Relay layers, Congestion Control, Leaky bucket algorithm, Traffic control.
Networking and Internetworking Devices: Repeaters, Bridges, Routers, Gateways, Routing Algorithms.
TCP/IP Protocol Suite: Overview, Network Layer, Addressing Subnetting, Transport Layer, Application Layer: Client Server Model, BOOTP, DHCP, DNS, Telnet, FTP, SMTP, SNMP, HTTP, WWW

Reference Books:

1. Behrouz A Forouzan “Data Communications and Networking TataMcGrawHill. “
2. Stallings W “Computer Communication Networks “
3. Tannenbaum A.S “Computer Networks” PHI
4. BarteeDataT.C Communication“ ,Network and systems
5. Schweber WL”Data CommunicationHill “Mc Graw
6. Steven W.R: TCP/IP Illustrated ,Vol 1 ,The p

MSC-304 Elective-I [Optimization Techniques] [OT] [CREDITS-4]

[MARKS 20+80=100]

Unit I

Graphical solution of linear programming problems, The Simplex Method: Computational procedure, .Artificial variable techniques, Two-phase simplex method.

Duality in linear programming: Concept of duality. Formulation of primal dual pairs, Duality and simplex method, Dual simplex method and algorithm, Computational procedure of the revised simplex method

Unit II

Transportation Problems: Mathematical formulation, Vogel's method with optimality test - MODI method, Unbalanced transportation problem. Assignment problem - Mathematical formulation, Hungarian assignment method, the travelling salesman's problem

Unit III

Sequencing problems: Problems with n jobs & 2 machines, n jobs and k machines, 2 jobs and k machines.

Integer Programming: Gomory's methods, Branch & Bound method.

Network Scheduling: Basic terms, Critical path methods, PERT

Unit IV

Queuing Theory: Characteristics of queuing systems, Poisson process and exponential distribution, Steady state M/M/1, M/M/C (Models I, II, IV, V)

Inventory Control: Inventory Costs, Economic order quantity, Deterministic inventory problems, EOQ problems with no shortage, With shortage, Production problem with no shortage, with shortage

Reference Books:

1. Operations Research - Kanti Swarup, P. K. Gupta & Man Mohan, Sultan Chand & Sons Pub.
2. Operations Research –S. D. Sharma, Kedar Nath Ram Nath Pub.
3. Operation Research - Hamdy A. Taha, McMillan Pub.

MSC-304 Elective-I (DIGITAL IMAGE PROCESSING) [DMP] [CREDITS-4]

[MARKS 20+80=100]

Unit- I: Introduction and fundamentals of DIP

The Origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing, Fundamental Steps in Digital Image Processing Digital Image Fundamentals, Elements of Visual Perception, Light and the Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization , Some Basic Relationships between Pixels, An Introduction to the Mathematical Tools Used in Digital Image Processing

Unit- II: Intensity Transformations and Spatial and frequency Domain.

Background, Some Basic Intensity Transformation Functions, Histogram Processing, Fundamentals of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters Filtering in the Frequency Domain, Preliminary Concepts, The Discrete Fourier Transform (DFT), The Basics of Filtering in the Frequency Domain, Image Smoothing Using Frequency Domain Filters, Image Sharpening Using Frequency Domain Filters.

Unit- III: Morphological Image Processing

Erosion and Dilation, Opening and Closing, Gray-Scale Morphology, Some Basic Morphological Algorithms

Unit- IV: Image Segmentation

Point, Line, and Edge Detection, Thresholding, Region-Based Segmentation, Segmentation Using Morphological Watersheds

Object Representation, Description and Recognition:

Representation, Boundary Descriptors, Region Descriptors, Pattern and Pattern Classes, Matching.

Suggested readings:

1. A.K. Jain, PHI, New Delhi, "Fundamentals of Digital Image Processing ",2012
2. Chanda Dutta Magundar, "Digital Image Processing and Applications", Prentice Hall of India, 2000
3. Millman Sonka, Vaclav hlavac, Roger Boyle, Broos/colic, Thompson Larniy, "Image Processing Analysis and Machine Vision" (1999)
4. Rafael C Gonzalez, Richard E Woods 2nd Ed., "Digital Image Processing" Pearson Education2003.
5. William K Pratt, "Digital Image Processing", John Willey (2001).

MSC-304 Elective-I (Cloud Computing) [CC] [CREDITS-4]

[MARKS 20+80=100]

Unit- I: Introduction to Cloud Computing

Cloud Computing: Definition, Cloud Architecture, Cloud Storage, Advantages and Disadvantages of Cloud Computing, Companies in the Cloud Today, Cloud Services, **Cloud Types:** The NIST Model, The Cloud Cube Model, Deployment Models, Service Models **Cloud Computing, Service Models:** Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS).

Unit- II: Developing Cloud Services, Cloud Computing for Everyone

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation

Unit- III: Using Cloud Services

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases – Storing and Sharing Files

Unit- IV: Cloud Security and Challenges

Cloud computing security architecture: Architectural Considerations- General Issues, Trusted Cloud computing, Secure Execution Environments and Communications, Micro-architectures; Identity Management and Access control Identity management, Access control, Autonomic Security **Cloud computing security challenges:** Virtualization security management virtual threats, VM Security Recommendations, VM-Specific Security techniques, Secure Execution Environments and Communications in cloud.

Suggested readings

1. Barrie Sosinsky, "Cloud Computing Bible", Wiley India pub
2. Dinakar Sitaram, "Moving to The Cloud" , Elsevier, 2014.
3. Danc.Marinercus, "Cloud Computing Theory And Practice", Elsevier, 2013.
4. Judith Hurwitz, Robin Bloor, Marcia Kaufman, and Dr. Fern Halper, "Cloud Computing for Dummies" , Wiley Publishing, 2010.
5. Michael Miller, "Cloud computing" , Pearson Pub.

MSC-304 Elective-I (Geographic Information System) [GIS] [CREDITS-4]

[MARKS 20+80=100]

Unit- I: Introduction to Geographic Information System

Overview, Definition of GIS, Evolution of GIS, Components of GIS, Approaches to the study of GIS, Introduction of Maps, Characteristics of Maps, Map Projection, plane and geographic coordinates, Acquisition of Geospatial Data, Topographic mapping, acquisition of attribute data: Thematic Mapping.

Unit- II: Representation of Geospatial Data

Issues pertaining to the Digital Representation of Geospatial Data, Database and Database Management System, Raster Geospatial Data representation, Vector Data Representation, the relationship between data representation and data analysis in GIS, definition of data quality, components of geospatial data quality, assessment of data quality.

Unit- III: Raster and Vector Geoprocessing

Characteristics of Raster Geoprocessing, acquiring and handling raster geospatial data, output functions of Raster geoprocessing, cartographic modeling, characteristics of Vector geoprocessing, Vector data input functions, nontopological GIS Analysis function, feature based topological functions, layer based topological functions.

Unit- IV: Digital Terrain Modeling, GIS Issues and Prospects

Introduction, Definitions and terminology, Approaches to Digital Terrain Data Sampling, Acquisition of Digital Terrain Data, Data Processing, Analysis and Visualization, Application of Digital Terrain Models.

GIS Issues and Prospects

Introduction, GIS becoming mainstream information technology, issues of implementation GIS, Trends in GIS Development, frontiers of GIS Research.

Suggested readings:

1. C.P. Lo Albert, K.W. Yonng, "Concepts & Techniques of GIS", Prentice Hall (India) Publications. 2009
2. Kang tsung chang, "Geographic Information System", TMH Publications & Co., 2000
3. Fundamental of GIS by Mechanical designs John Wiley & Sons 2008
4. Peter A Burragh and Rachael, A. Mc Donnell, Principals of Geo physical Information Systems Oxford Publishers 2004.
5. Remote Sensing and its applications by LRA Narayana University Press 1999.
6. S.Kumar, Basics of Remote sensing & GIS, Laxmi Publications. 2005

MSC-305 Elective-II (Artificial Intelligence)[AI] [CREDITS-4]

[MARKS 20+80=100]

Unit – I

Introduction to AI, Application areas of AI, State-Space-Search: Production system design, Production system characteristic.

Search Techniques

Blind search: Depth first search, Breadth first search.

Heuristic search Techniques: Hill Climbing, Best first search, Branch and bound, A*, AO*.

Unit- II

Game playing: Min-Max Search, Alpha-Beta Cutoff.

Knowledge Logic: Skolemizing queries, Unification algorithm, Modes Ponens, Resolution.

Unit- III

Structured knowledge representation,; Semantic nets, Frames, Conceptual dependencies, Scripts.

Unit – IV

Expert System: Expert System need & Justification, Rule based architecture, Non production system architecture, Case studies of expert system: MYCIN, R1. Learning: Concept of learning, Types of learning, Genetic algorithm, Neural network.

Natural language processing: Introduction syntactic processing, semantic analysis, discourse and pragmatic processing.

Reference Books:

1. Rich & Knight (Chapters 1.1,2,3,5,9,10.1,10.2,12.1, 12.2, 12.3, 15.1-15.4, 17.1-17.6)
2. Dan W. Patterson (Chapters 4.1-4.4, 5.3, 11.1,11.4, 15.1-15.4)
3. N.J. Nilsson Intelligence "Artificial new Synthesis" Inte
4. Russel & Norvig "Artificial Intelligence a Modern App

MSC-305 Elective-II (Cryptography and Network Security)[CNS][CREDITS-4]

[MARKS 20+80=100]

Unit I

Overview of Cryptography, Substitution and affine cipher , Polyalphabetic Cipher and their cryptanalysis, Perfect Security, Block Cipher, Data Encryption Standard (DES), 2DES, 3DES, Differential and linear Cryptanalysis, Block Cipher Design Principles, Block Cipher modes of operation, Advanced Encryption Standard..

Unit II

Principles of Public-Key Cryptosystems, The RSA Algorithm, Key Management, Diffie-Hellman Key Exchange and Cryptanalysis, Authentication Functions, Message Authentication Codes (MAC), Hash Functions, Security of Hash Functions and MAC, Secure Hash Algorithm, HMAC.

Discrete Logarithms, ElGamal System, Schnorr signature scheme, The ElGamal signature scheme, The digital signature algorithm, Provable secure signature schemes

Unit III

Elliptic curve over the reals, Elliptic curves modulo a prime, Properties of Elliptic curves Point compression and ECies, Computing point multiples on Elliptic curves, Elliptic curve digital signature algorithm, ECElGamal Cryptosystem, ElGamal EC Digital signature scheme, Elliptic curve factorization, Elliptic curve primality test.

Unit IV

Network Security Practice: Kerberos, X.509 Authentication Service, Public Key Infrastructure, E-Mail Security (Pretty Good Privacy), IP Security (Architecture, Authentication Header, Encapsulation Security Payload, Combining Security Associations, Key Management), Web Security (Secure Sockets Layer and Transport Layer Security).

Reference Books:

1. W. Stallings –Cryptography and Network Security Principles and Practice, Pearson Education Asia, 3rd Edition, 2000.
2. D. Stinson - Cryptography : Theory and Practice, CRC Press, 2006
3. Bernard Menezes," Network Security and Cryptography.
4. Atul Kahate, "Cryptography and Network Secur

MSC-305 Elective-II (Big Data Analysis) [BDA] [CREDITS-4]

[MARKS 20+80=100]

Unit- I: Data Mining Introduction

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Tasks, Data Mining Task Primitives, Data Mining Vs KDD's, Major issues in DM.

Unit- II: Data Warehouse and OLAP Technology for Data Mining , Classification

Introduction to Data Warehouse, Data Warehouse Features, Data Warehouse Architecture, Data Warehouse Implementation, OLAP and OLTP, Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization, Data Marts Vs Data warehouse.

Introduction, Classification by Statistical based algorithms, Decision Tree based algorithms, Neural Network based algorithms, Rule based algorithms, Bayesian Classification, Support Vector Machines (SVM).

Unit- III: Association rules and Clustering

Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Item set Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining, Cluster Analysis Introduction : Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Constraint-Based Cluster Analysis, Outlier Analysis

Unit- IV: Introduction to Web Mining

Introduction: Web Mining- Content Mining, Web Structure Mining, Web Usage Mining, Examples of web mining and applications.

Suggested readings:

1. Arun K Pujari, Data Mining Techniques, 2nd edition, Universities Press.
2. Han, Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann
3. K.P.Soman, S.Diwakar, V. Ajay, Insight into Data Mining, PHI, 2008.
4. M.H. Dunham, "Data Mining Introductory and Advanced Topics", Pearson Education.
5. M Berry and G. Linoff, "Mastering Data Mining", John Wiley.
6. Pieter Adriaans, Dolf Zantinge , "Data Mining", Pearson Education Asia
7. Sam Aanhory & Dennis Murray, Data Warehousing in the Real World, Pearson Edn Asia.

MSC-305 Elective-II (Soft Computing) [SC] [CREDITS-4]

[MARKS 20+80=100]

Unit- I: Foundations of intelligent and soft computing

Crisp Sets: an Overview : Fuzzy Sets: Basic Types ,Fuzzy Sets: Basic Concepts , Fuzzy Sets Vs Crisp Sets,,Additional Properties of alpha cuts ,Presentation of fuzzy sets , Extension principle for fuzzy sets

Unit- II: Operations on Fuzzy Sets

Fuzzy complements, Fuzzy Union, Fuzzy Intersections, Crisp & Fuzzy Relation, Binary Fuzzy Relation, Binary Relation on single set, Fuzzy Equivalence Relations, Fuzzy Compatibility Relation

Unit- III: Introduction to Neural Networks :

Biological Neuron and their Artificial Neuron , McCulloch-Pits Neuron Model ,Perceptron Classification ,Linearly Separability, XOR Problem ,Overview of Neural Network Architecture ,Learning Rules ,Supervised ,Learning ,Unsupervised Learning ,Perceptron Learning , Reinforcement Learning ,Delta Learning Rule

Unit- IV: Multilayer Feed forward,

Generalized Delta Learning, Back propagations training algorithm and derivation of weight ,Variant in Back propagations ,Radial Basis Function (RBF) ,Application of BP and RBF N/W

Recurrent Network and Unsupervised Learning

Hopfield Network ,Counter propagation networks , Boltzman Machine, Application in Pattern Recognitions.

Suggested readings:

1. George J. Klir, Bo Yuan ,Fuzzy Sets and Fuzzy Logic Theory and Application
2. George J. Klir, Tina A. Floger ,Fuzzy Sets Uncertainty and Information
3. John hertz, Krogh and Richard , Introduction to the Theory of Neural Competition, Addison Wesley
4. Jaack M. Zurada, Introduction to Artificial Neural Network
5. Koska , Neural Network and Fuzzy System A Dynamic System PHI Edition

MSC - 306 Advance Java Lab[AJL][CREDITS=2]

[MARKS =100]

1. Design a web page having blue colour background and white colour text with title „student details“.
2. Design a web page having three paragraphs with different alignment, text colour and font size.
3. Design a web page to demonstrate physical style tags.
4. Design a web page having three hyperlinked text and two hyperlinked images.
5. Design a web page that contains an ordered list of operating system and an unordered list of programming languages.
6. Design a web page that contains a nested list.
7. Design a web page to display mark sheet of a student in table format.
8. Design a web page to create an image gallery of six images arranged in 2X3 table.
9. Design a web page to create a registration form having name, address, password, gender, course, nationality, skill and CV with appropriate GUI control.
10. Develop a HTML document having three vertical frame of equal size.
11. Design a web page having four paragraphs with different font, text and background properties using external CSS.
12. Design a web page having three shadowed images and four rounded corner buttons using inline style sheet.
13. Develop a JavaScript program that accepts student details and displays accepted information in formatted manner.
14. Develop a JavaScript program that reads a string and then displays the string 10 times with alternate red and blue colour.
15. Develop a JavaScript program that reads an integer and displays its multiplication table in html table format.
16. Develop a JavaScript program that reads p and n and calculates $P(n,r)$ using user defined factorial function.
17. Develop a JavaScript program to demonstrate parseInt(), parseFloat() and eval() function.
18. Develop a JavaScript program that accept n values in an array and perform the following operation
 - (i) Sort (ii) Reverse (iii) Insert element at the beginning (iv) Delete element from the end
19. Develop a JavaScript program that calculates reverse the number entered in first text field referring DOM hierarchy. The result is stored in second text field.
20. Develop a JavaScript for validation of mobile number and mandatory fields in a HTML form.
21. Develop a DHTML program to change background colour of a web page on clicking the corresponding button.
22. Develop a DHTML program for GUI calculator that performs all arithmetic operation.
23. Develop an XML document that contains employee (eid, ename, designation) details using internal DTD.
24. Develop an XML document that contains student (roll, name (first name, last name), address, contact) using external DTD.
25. Develop a Generic Servlet program to display message „Welcome to Servlet“ .Run this program in Apache Tomcat Web server.
26. Develop anHttp Servlet program to display message „Hello World“ in first level heading and red colour.

27. Develop a Servlet program to generate dynamic HTML that displays personal details in formatted manner. The details are accepted from client HTML page
28. Develop a Servlet that accepts basic pay, DA%, HRA%, Deduction% from client HTML page and generates payslip in table format using request response model.
29. Develop a Servlet for hit counter using session concept. The counter will be increased by 1 for every request.
30. Develop a JSP program to display current date and time. Run this program in Apache Tomcat web server.
31. Develop a JSP program that accepts two numbers x and y from client HTML page and calculates x^y .
32. Develop a JSP program that accepts a number n and display factorial of all numbers from 1 to n in table format.
33. Develop a JSP program that inserts records to table emp(eid,ename,salary) using JDBC. The data is accepted from client HTML page.
34. Develop a JSP program displays message "Welcome" for first client request. The message should be "Welcome Back" for second request onwards. Use the concept of session.
35. Develop a JSP program that manipulates a bean named student. Bean student has two property roll and name.
36. Develop a login application using JSF framework.
37. Develop a RMI program showing marshalling and unmarshalling processes.
38. Develop a stateless session bean that calculates mean of 3 numbers.
39. Develop a stateful session bean to perform deposit, withdraw and balance check operation on a bank account.
40. Develop a web based project university management system using JSP and database.

MSC - 307 Computer Networking Lab[CNL][CREDITS-2]

[MARKS 20+80=100]

1. Write a tcl script for creating network animator.
2. Write a tcl script for creating a simple topology with two nodes and a link.
3. Write a tcl script for creating nodes, links and orientation.
4. Write a tcl script for creating nodes, links , orientation and labelling.
5. Write a tcl script for creating nodes, links, bandwidth and delay description.
6. Write a tcl script for creating eight nodes , bandwidth, delay and queue of the link
7. Write a tcl script to set identification colors to the links.
8. Write a tcl script for UDP communication between two nodes.
9. Write a tcl script for UDP communication in a network topology having ten number of nodes.
10. Write a tcl script for TCP communication between two nodes.
11. Write a tcl script for TCP communication between two sources and two destinations.
12. Write a tcl script for TCP communication for more number of nodes.
13. Write a tcl script to drop down packets in a link.
14. Write a tcl script to drop down packets in a router and end server at a particular time.
15. Write a tcl script to drop down packets in a link at particular time interval.

FOURTH SEMESTER

MSC- 401 Project Work [PW] [CREDITS=8]

[MARKS 100+50+50=200]

Each student must have an internal supervisor who is a faculty of the department/ Institution. Each student must submit the abstract of the project which will be approved by the department on the recommendation of the internal supervisor. .

Guidelines: SUMMARY/ABSTRACT

All students must submit a summary/abstract of the project to be undertaken to the internal supervisor for approval, preferably, should be of about 3-4 pages. The content should be as brief as is sufficient enough to explain the objective and implementation of the project that the candidate is going to take up. The write up should include the followings-

1. Name / Title of the Project
2. Statement about the Problem
3. Why is the particular topic chosen?
4. Objective and scope of the Project
5. Methodology (including a summary of the project)
6. Hardware & Software to be used
7. Testing Technologies used
8. What contribution would the project make?

After the approval, the student is allowed to carry out the project in any organization/ Institution. He/She must immediately inform the internal supervisor about the name and contact details of the external supervisor in the organization/Institution. Moreover he must report to the internal supervisor about the progress of his/her work periodically. After the end of 16 weeks, the student is required to submit the project report in the department after getting approved by the internal and external supervisors.

Guidelines for preparation of the final project report

Good quality white executive bond paper of A4 size should be used for typing and duplication with the following specification

Left margin : 3.0cm

Right margin : 2.0cm

Top margin : 2.5cm

Bottom margin : 2.5cm

Page numbers: All text pages as well s the Program source code should be numbered in the bottom center of the pages.

Font size of the normal Text :12pt Times New Roman

Font size of Paragraph Heading :14pt Times New

Roman Font Size of chapter Heading :18pt Times New

Roman Font size of Code :10pt Courier New

Format of the Project report

Cover page

Certificate of the internal supervisor

Certificate of the external supervisor

Self certificate

Acknowledgement

List of abbreviations, figures, Tables

Synopsis of the project (3-4 pages)

Main Report

Objective and scope of the project

Theoretical background

Definition of the problem

System Analysis and design
System planning
Methodology adopted
System implementation
System maintenance and Evaluation
Cost benefit Analysis
Detail life cycle of the project
Test reports (print out of the reports)
Print out of the code
References

Every student has to submit the followings

- (a) One hard copy of the Project report
- (b) Soft copy of the project on CD (to be submitted to the University) on a cover mentioning the name of the project, name of the student, Regd No. , name of the department, Year
- (c) One copies of the synopsis of the project report

Evaluation of the Project

Evaluation of the project will be done by a jury of experts including one external expert, Head of the Department, internal supervisor, two teachers of the department. The evaluation will be done on the basis of the followings:

Project report : 100 marks
Presentation : 50 marks
Viva-Voce : 50 marks