VIKRAMA SIMHAPURI UNIVERSITY, NELLORE
DEPARTMENT OF COMPUTER SCIENCE

Course Structure for Master of Computer Science for V.S. University Constituent College(s) and Affiliated Colleges under the jurisdiction of Vikrama Simhapuri University, Nellore with effect from 2017-18 Academic Year

Semester	Paper Number	Title of the Paper	Core/ Generic Elective / Open Elective	Credits	L	T	P	Total	Sess. Max. Marks	Univ Max. Marks	Total Marks
First Semester	MSC17101	Discrete Mathematical Structures	Compulsory Foundation	4	3	1	0	4	30	70	100
	MSC17102	Computer Organization	Core	4	3	1	0	4	30	70	100
	MSC17103	Data Structures	Core	4	3	1	0	4	30	70	100
	MSC17104	Database Management Systems	Core	4	3	1	0	4	30	70	100
	MSC17105	Operating Systems & System Programming	Core	4	3	1	0	4	30	70	100
	MSC17106	Human Values and Professional Ethics –I	Compulsory Foundation	2	2	0	0	2	30	70	100
	MSC17103P	Data Structures Lab		2	0	0	4	4	30	70	100
	MSC17104P	Database Management Systems Lab		2	0	0	4	4	30	70	100
	MSC17105P	Operating Systems & System Programming Lab		2	0	0	4	4	30	70	100
Total				**28**	**17**	**5**	**12**	**34**	**270**	**630**	**900**

Syllabus for Master of Computer Science for V.S. University Constituent College(s) and Affiliated Colleges under the jurisdiction of Vikrama Simhapuri University, Nellore with effect from 2017-18 Academic Year

MSC17101: Discrete Mathematical Structure

UNIT – I:

Fundamentals:
Sets, Relations and functions, Fundamentals of logic, Logical Implementation, Logical Equivalence, First order logic, Truth Tables, Tautologies, Mathematical induction

Elementary Combinatorics:
Combinations and Permutations, Enumeration - with repetitions, with constrained repetitions, The Principle of Inclusion - Exclusion. Chapter (1-2)

UNIT –II:

Recurrence Relations:
Generating functions, Coefficients of Generating functions, Recurrence Relations, Methods of Characteristics Roots, Inhomogeneous Recurrence Relations Chapter (3)

UNIT – III:

Relations and Diagrams:
Relations and diagrams, Binary relations, Equivalence relations, Ordering relations, Lattices, Paths and Closures, Directed graphs, Isomorphism, Adjacency matrices - Applications, Sorting and Searching Chapter (4)

UNIT – IV

Trees & Graphs:
Trees, Properties of trees, Graphs, Spanning trees, Binary trees, BFS, DFS, Kruskals Algorithm, Planar graphs, Euler Circuits, Hamiltonian graphs, Chromatic numbers, Four-color problem, Network Flows (Chapter 5 & 7.2)

Text Books:

1. Discrete Mathematics For Computer Scientists, (Chapter 1-5) BY J L Mott, A Kandel and T P Baker
2. Discrete mathematics by KH Rossen (tmh)

Reference Books:

3   Discrete mathematical structure - (tmh) by Trembley and Manohar

4   Discrete mathematics with algorithms - (John Wiley) by M. O. Albertson and J .P. Hutchinson

5   "Graph Theory with Applications to Engineering and Computer Science" prentice Hall, Englewood Cliffs, 1974.

6   J. P Tremblay and R.P Manohar, DMS with Applications to Computer Science, Tata MC. Graw – Hill, 2001.

MSC17102: Computer Organization

UNIT - I:

Basic Structure of Computers- Functional Units- Basic Operational Concepts- Bus Structure- Software- Performance- Multiprocessor and Multicomputer – Historical Perspective.

UNIT - II:

Number System and Computer Arithmetic – Signed and Unsigned Numbers, Addition and Subtraction, Multiplication, Division, Floating Point Arithmetic Operations, Logic Gates, Boolean Algebra , K-Maps.
Combinational and Sequential Circuits – Half adder, Full adder, Flip flops, Sequential Circuits, Decoders, Encoders, Multiplexers, Registers, Shift Registers, Binary Counters.
UNIT - III:

Memory Organization - Memory hierarchy, Main memory - RAM, ROM chips, Memory address map, memory connection to CPU, Associative Memory-Hardware logic, match, read and write logic, Cache Memory - Associative mapping, Direct mapping, Set-associative mapping, hit and miss ratio.
Micro Programmed Control: Control memory, Address sequencing, Micro Program example, design of control unit, Hard wired control, Micro programmed control

UNIT - IV:

Input - Output Organization - Peripheral devices, input-output interface-I/O Bus and interface modules, I/O versus Memory bus, isolated versus memory mapped I/O, Modes of transfer-Programmed I/O, Interrupt-initiated I/O, priority interrupts-Daisy chaining, parallel priority, interrupt cycle, DMA- DMA control, DMA transfer, Input output processor-CPU-IOP communication.
Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

Text Books:

1. Mano M.M. Computer System Architecture, 3rd edition. PHI, 1993.
2. Hamacher C, Vranesic Z, and Zaky S. Computer Organization, 5th edition, Mc Graw – Hill,2002.

Reference Books:

1. Stallings W, Computer Organization and Architecture, 6th edition. Parson Education, 2003.
2. Mano M.M. Computer System Architecture, 3rd edition. PHI, 1993.
3. Yarbrough JM, Digital Logic – Applications and Design, Thomas Lernig, 1997.

4. Heuring VP, and Jordan HF, Computer Systems Design and Architecture, Pearson Education, 1997.

MSC17203: Data Structures

UNIT - I:

Linear Data Structures: Abstract Data Types - Asymptotic Notations: Big-Oh, mega and Theta – Best, Worst and Average case Analysis: Definition and an example – Arraysand its representations – Stacks and Queues – Linked lists – Linked list based implementation of Stacks and Queues – Evaluation of Expressions – Linked list based polynomial addition.

UNIT – II:

Non-Linear Data Structures: Trees – Binary Trees – Binary tree representation and traversals – Threaded binary trees – Binary tree representation of trees – Application of trees: Set representation and Union-Find operations – Graph and its representations – Graph Traversals – Connected components.

UNIT – III:

Search Structures And Priority Queues: AVL Trees – Red-Black Trees – Splay Trees – Binary Heap

UNIT – IV:

Searching: Linear Search – Binary Search
Sorting: Insertion Sort – Merge Sort – Quick Sort – Heap Sort – Sorting With Disks – K-Way Merging – Sorting With Tapes – Polyphase Merge.

Text Books:

1. Ellis Horowitz and Sartaj Sahni, Fundamentals of Data Structures, Galgotia Book Sorce, Gurgaon, 1976. 2. Gregory L. Heilman, Data Structures, Algorithms and Object Oriented Programming, Tata Mcgraw-Hill, New Delhi, 2002.

Reference Books:

1. Jean-Paul Tremblay and Paul G. Sorenson, An Introduction to Data Structures with Applications, Second Edition, Tata McGraw-Hill, New Delhi, 1991.
2. Alfred V. Aho, John E. Hopcroft and Jeffry D. Ullman, Data Structures and Algorithms, Pearson Education, New Delhi, 2006.

MSC17104: Database Management Systems

UNIT-1: Database Fundamentals

Definitions of Database, DBMS, Characteristics of the Database Approach, Advantages and Applications & DBMS, Database Administrator (DBA) & Data Administrator.
DBMS Architecture, Database Languages: DDL, DML, Database Access from Applications Programs, Transaction Management, Data Storage and   Queering, Database   System Environment, Centralized and Client, Server Archituchers for DBMS, Entity Relationship Diagram, Applications & Examples of Database, Relationship Sets and Structural Constraints - Weak, Strong Entity Types.

UNIT-II: Relational Algebra and Calculus

Relational Algebra - Selection and Projection, Set Operating, Renaming, Join, Division, Examples of Algebra Queries, Relational Calculus, Table Relational Calculus, Domain Relational Calculus, Expressive Power of Algebra and Calculus, Examples & Basic SQL Queries, Nested Queries, Correlated Nested Queries, Set – Comparison Operators, Aggregate Operators, Null Values, Logical Connectives – AND, OR, NOT, Outers, Joins, Constraints in SQL Triggers.

UNIT-III: Schema Refinement

Problems Caused By Redundancy, Decomposition, Problems Related to Decomposition, Functional Dependency, Database Tables and Normalization, Need For Normalization, Normal Forms - 1st ,2nd ,3rd, BCNF, Properties of Decomposition - Loss Less Join Decomposition, Schema Refinement in Database Design, Multi Valued Dependencies, Fourth Normal Form, Fifth Normal Form.

UNIT-IV: Overview & Transaction Management

ACID Properties, Transaction and Schedules, Concurrent Execution of Transactions,- Local Based Concurrency Control, Deadlocks Concepts, Concurrency Control - Serializability and Recoverability, Introduction Lock Management - Lock Conversions, Dealing with Dead Locks, Locking Techniques, Concurrency Control Without Locking, Introduction to ARICS, The Log, Other Recover Related Structures

Text Books:

1. Database System Concepts, A. Silberschatz, H.F. Korth, S.Sudarshan, Mcgraw Hill, VI Edition,-2006.

2. Fundamentals of Database Systems 5th Edition Ramez Elmasri, Shamkant, Navathe, Pearson Educations,2008
3. Database System Concepts,Silberrchatz, Korth,Megrow Hill, V Edition

Reference Books:

4. Database system concepts, peter Rob& carlos coronel,cengage,learning,2008
5. Database development and management, Lee chao, Auerbach publications, Taylor & Francis Group.

MSC17105: Operating Systems & System Programming

UNIT – I:

Introduction: What is an Operating Systems Do, 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
Process – Concept: Overview, Process Scheduling, Operations on Processes, Interprocess Communication, Examples of IPC Systems, Communication in Client – Server Systems
Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple – Processor Scheduling, Thread Scheduling, Operating System Examples, Algorithm Evaluation

UNIT – II:

Synchronization: Background, The Critical – Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions
Deadlocks: System Model, Deadlock Characterization, Methods for handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock
Memory – Management Strategies: Background, Swapping, Contiguous Memory Allocation, paging, Structure of the Page Table, Segmentation, Example: The Intel Pentium

UNIT – III:

Virtual – Memory Management: Background, Demand Paging, Copy – on – Write, Page Replacement, Allocation of Frames, Thrashing, memory – Mapped Files, Allocating Kernel Memory, Other Considerations, Operating – System Examples
Loaders and Linkers: Basic Loader Functions, Machine – Dependent Loader Features, Machine – Independent Loader Features, Loader Design Options

UNIT – IV:
Macro Processors: Basic Macro Processor Functions**,** Machine – Independent Macro Processor Features, Macro Processor Design Options
Compilers: Basic Compiler Functions, Machine – Dependent Compiler Features, Machine – Independent Compiler Features, Compiler Design Options

Text Books:

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Seventh Edition.
2. System Software An Introduction to Systems Programming, Leland L. Beck, D. Manjula, 3rd Edition

MSC17103P: Data Structures Lab

1. Write C ++ Programs to implement the following using an array.
   a) Stack ADT
   b) Queue ADT
2. Write C ++ programs to implement the following using a singly linked list.
   a) Stack ADT
   b) Queue ADT
3. Write C ++ program to implement the deque (double ended queue) ADT using a doubly linked list
4. Write a C ++ Program to perform the following operations.
   a) Insert an element into a binary search tree.
   b) Delete an element from a binary search tree.
   c) Search for a key element in a binary search tree.
5. Write a C ++ program to implement circular queue ADT using an array.
6. Write C ++ programs that traverse the given binary tree in.
   a) Preorder
   b) Inorder and
   c) Postorder.
7. Write a C ++ programs for the implementation of BFS and DFS for a given graph.
8. Write C ++ programs for implementing the following sorting methods.
   a) Quick sort
   b) Merge sort
   c) Heap sort
   d) Selection sort
   e) Exchange sort
   f) Insertion sort.
9. Write a C ++ program to perform the following operations.
   a) Insertion into a 2-3 tree
   b) Deletion from a 2-3 tree
10. Write C ++ programs to implement
    a) Sequential
    b) Binary search
11. Implement conversion of infix expressions to post fix notation simple expression evaluator that can handle +, -, /, *.
12. Polynomial Operations using Linked lists.

MSC17104P: Database Management Systems Lab

1. Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
3. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)
4. i. Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
   ii. Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
5. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
6. Write PL/SQL procedure for an application using exception handling.
7. Write PL/SQL procedure for an application using cursors.
8. Write a PL/SQL block for transaction operations of a typical application using triggers.
9. Write a PL/SQL block for transaction operations of a typical application using package.
10. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers
11. Implementing operation on relation using PL/SQL
12. Generating Reports

REFERENCES:

1. ORACLE PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Edition.
2. SQL & PL/SQL for Oracle 10g, Black Book, Dr.P.S. Deshpande.
3. Oracle PL/SQL Programming,Steven Feuerstein,SPD.
4. Database Systems using Oracle: A Simplified Guide to SQL and PL/SQL, Shah, PHI.

MSC17105P: Operating Systems & System Programming Lab

1. Simulate the following CPU Scheduling algorithms
    a) Round Robin
    b) SJF
    c) FCFS
    d) Priority
2. Simulate all file allocation strategies.
    a) Sequential
    b) Indexed
    c) Linked
3. Simulate MVT and MFT

4. Simulate all File organization techniques.
    a) Single level directory
    b) Two level
    c) Hierarchical
    d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm Dead Lock Prevention.
7. Simulate all Page replacement algorithms.
    a) FIFO
    b) LRU
    c) LFU
    d) Etc….
8. Simulate Paging Techniques of memory management.

Semester	Paper Number	Title of the Paper	Core/ Generic Elective / Open Elective	Credits	L	T	P	Total	Sess. Max. Marks	Univ Max. Marks	Total Marks
Second Semester	MSC17201	Design & Analysis of Algorithms	Core	4	3	1	0	4	30	70	100
	MSC17202	Data Communications and Computer Networks	Core	4	3	1	0	4	30	70	100
	MSC17203	Object Oriented Programming with Java	Core	4	3	1	0	4	30	70	100
	MSC17204	Software Engineering	Core	4	3	1	0	4	30	70	100
	MSC17205	Operations Research	Core	4	3	1	0	4	30	70	100
	MSC17206	Human Values and Professional Ethics - II	Compulsory Foundation	2	2	0	0	2	30	70	100
	MSC17203P	Object Oriented Programming with Java Lab		2	0	0	4	4	30	70	100
	MSC17204P	Software Engineering Lab		2	0	0	4	4	30	70	100
	MSC17202P	Data Communications and Computer Networks Lab		2	0	0	4	4	30	70	100
	MSC17208S	Seminar		2	0	0	2	2	50	-	50
Total				**30**	**17**	**5**	**14**	**36**			

ANNEXURE -II

VIKRAMA SIMHAPURI UNIVERSITY, NELLORE
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MSC17201: DESIGN AND ANALYSIS OF ALGORITHMS

UNIT-I
Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big notation, Omega notation, theta notation and Little notation, Probabilistic analysis, Amortized analysis.
Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and biconnected components.

UNIT-II
Divide and conquer: General method , applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.
Greedy method: General method, applications-Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT-III
Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.
Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

UNIT-IV
Branch and Bound: General method, applications - Travelling sales person problem,0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution. NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms.

TEXT BOOKS :
1. Fundamentals of Computer Algorithms, Ellis Horowitz,Satraj Sahni and
Rajasekharam,Galgotia publications pvt. Ltd.
2. Algorithm Design: Foundations, Analysis and Internet examples,
M.T.Goodrich and R.Tomassia,John wiley and sons.

REFERENCES:
1. Introduction to Algorithms, secondedition,T.H.Cormen,C.E.Leiserson, R.L.Rivest, and C.Stein,PHI Pvt. Ltd./ Pearson Education
2. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T.Lee, S.S. Tseng, R.C.Chang and T.Tsai, Mc Graw Hill.
3. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.
4. Design and Analysis of algorithms, Aho, Ullman and Hopcroft,Pearson education.
5. Algorithms – Richard Johnson baugh and Marcus Schaefer, Pearson Education

MSC17202: DATA COMMUNICATIONS AND COMPUTER NETWORKS

UNIT – I

Introduction – Data Communications, Networks, The Internet, Protocols and Standards.

Network Models – Layered Tasks, the OSI Model, Layers in the OSI Model, TCP/IP Protocol Suite, Addressing.

Physical Layer and Media – Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission Impairment, Data Rate limits, Performance.

Digital Transmission – Digital – To – Digital Conversion, Analog – To- Digital Conversion, Transmission Modes

Analog Transmission - Digital – To – Analog Conversion, Analog – To- Analog Conversion

UNIT – II

Bandwidth Utilization: Multiplexing and Spreading – Multiplexing, Spread Spectrum,

Transmission Media – Guided Media, Unguided Media: Wireless

Switching: Circuit – Switched Networks, Datagram Networks, Virtual – Circuit Networks, Structure of a Switch

UNIT – III

Error Detection and Correction – Introduction, Block Coding, Linear Block Codes, Cyclic Codes, Checksum

Data Link Control – Framing, Flow and Error Control, Noisy Channels, HDLC, Poit – Point Protocol

Multiple Access – Random Access, Controlled Access, Channelization

UNIT – IV

Network Layer: Logical Addressing – IPv4 Address, Ipv6 Address

Network Layer: Address Mapping, Error Reporting and Multicasting – Address Mapping, ICMP, IGMP, ICMPv6

Congestion Control and Quality of Service – Data Traffic, Congestion, Congestion Control, Two Examples, Quality of Service, Techniques to Improve Qos, Integrated Services, Differentiated Services, Qos In Switched networks

Application Layer – Name Space, Domain Name Space, Distributed of Name Space, DNS in the Internet, Resolution, DNS Message, Types of Records, Registers, Dynamic Domain Name System (DDNS), Encapsulation

Remote Logging, Electronic Mail and File Transfer: Telnet, Electronic Mail, File Transfer

TEXT BOOK:

1. Data Communications and Networking by Behrouz A Forouzan, 4ᵗʰ Edition, Tata McGraw Hill Education PVT Lmtd.

MSC17203: OBJECT ORIENTED PROGRAMMING WITH JAVA

UNIT – I

Introduction to Java – Features, JVM, Parts of Java, First step towards Java Programming- API Document, Starting a Java Program, Formatting the Output, Naming Conversions and Data Types, Literals, Operators in Java, Control Statements, Input and Output

UNIT – II

Arrays – Types of Arrays, Three Dimentional Arrays, arrayname.length, Comand Line Arguments, Strings, StringBuffer and StringBuilder–Creating StringBuffer Objects, StringBuffer Class Methods, StringBuilder Class, StringBuilder Class Methods, Introduction to OOPs - Problems in Procedure Oriented Approach, features of OOP system

UNIT – III

Classes and Objects – Object Creation, Initializing the Instance Variables, Access Specifiers, Constructors, Methods in Java, Relationship between Objects, Inheritance, Polymorphism

UNIT – IV

Type Casting, Abstract Classes, Interfaces, Packages, Exception Handling, Wrapper Classes, Streams and Files, Treads, Graphics Programming using AWT

TEXT BOOK

1. Core JAVA An Integrated Approach by Dr. R. Nageswara Rao, Dreamtech Publication, 2014 Edition.

MSC17204: SOFTWARE ENGINEERING

UNIT - I

Software, Software Engineering, and Process: The nature of Software, The unique nature of WebApps, Software engineering- A layered technology, The essence and principles of software engineering practice, Generic process model (framework), Process patterns, Process assessment and improvement, CMMI, Software myths.
Process Models: Prescriptive process models: The waterfall model, Incremental process models, Evolutionary process models. Concurrent models, Component Based Method Model, Agile Modeling, Aspect oriented software development, Unified process.

UNIT-II

Umbrella Activities: Risk management, Software quality assurance, Software configuration management.
Measurement and metrics: Size oriented metrics, Function oriented metrics, Metrics for software quality.
Software Requirements: Introduction to functional and non-functional requirements, Requirementsengineering activities, Eliciting requirements, Requirements modeling, Requirements validation, Software requirements specification(SRS), Requirements management.
Requirements modeling: Structured view: Data modeling (ERD), Flow-Oriented modeling(DFD), Behavioral modeling, Object models, Structured methods.
Software Project Estimation: Empirical estimation models.

UNIT - III

Design Concepts: Software design quality guidelines and attributes, Design concepts, Design model.
Software Architecture: Architecture and its importance, Architectural Styles, Data design, Architectural design.
Design : Structured view (Traditional view): Architectural mapping using data flow (Call and return architecture), Interface design, Function based component design.
Object oriented view: OO Architecture, Class hierarchies, Message design, Class based component design.
Performing User Interface Design: Golden rules, User interface analysis and design, interface analysis, interface design steps.
Pattern Based Design: Design patterns, Pattern based software design, Architectural patterns, Component level design patterns, User interface design patterns.

UNIT - IV

Testing Strategies: A strategic approach to software testing – Verification and Validation – Organizing for Software Testing – Testing Strategies – Criteria for completion of testing – unit, integration, validation and system testing – debugging.
Testing Tactics: Testing Fundamental – White Box, Black Box, and Control Structure Testing – Object Oriented testing Methods.
Product metrics: Metrics for the requirements model, Metrics for the design model, Metrics for source code, Metrics for testing, Metrics for maintenance.
Software – Reengineering: AS/W reengineering process model, Software reengineering activity.

TEXT BOOK:

Software Engineering, A practitioner's Approach- Roger S. Pressman, 7th edition.   McGrawHill International Edition.

REFERENCES:

1. Software Engineering- Sommerville , 8th edition, Pearson education.
2 . Software Engineering- K.K. Agarwal & Yogesh Singh,New Age International Publishers
3. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.
4. Systems Analysis and Design- Shely Cashman Rosenblatt,Thomson Publications.
5. Software Engineering principles and practice- Waman S Jawadekar, The McGraw- Hill Companies.

MSC17205: OPERATIONS RESEARCH

UNIT I

Introduction to Operations Research
Basics definition, scope, objectives, phases, models and limitations of Operations Research, Linear Programming Problem – Formulation of LPP, Graphical solution of LPP, Simplex Method, Artificial variables, big-M method, Two phase simple method, Degeneracy & Unbounded solutions.
Dual Simplex problem, Comparison of solutions of the dual and its primal, Dual simple method.

UNIT II

Transportation Problem
Formulation, solution, unbalanced Transportation problem. Finding basic feasible solutions – Northwest corner rule, least cost method and Vogel's approximation method, Optimality test- the stepping stone method and MODI method.
Assignment model
Formulation, Hungarian method for optimal solution, Solving unbalanced problem, Traveling salesman problem as assignment problem.
Sequencing models
 Solution of Sequencing Problem – Processing n Jobs through 2 Machines – Processing n Jobs through 3 Machines – Processing 2 Jobs through m machines – Processing n Jobs through m Machines.

UNIT III

Replacement Models
Replacement of Items that deteriorate whose maintenance costs increase with time without change in the money value, Replacement of items that fail suddenly: individual replacement policy, group replacement policy.
Non-Linear Programming
Basic concepts of Non linear programming, Problem Constrained, Unconstrained optimization, Kuhn-kucker conditions, Quadratic programming.

UNIT IV

 Games Theory
Competitive games, rectangular game, saddle point, minimax (maximin) method of optimal strategies, value of the game, Solution of games with saddle points, dominance principle, Rectangular games without saddle point – mixed strategy for 2 X 2 games, graphical method,dominance principle.
Inventory models
Inventory costs, Models with deterministic demand – model (a) demand rate uniform and production rate infinite, model (b) demand rate non-uniform and production rate infinite, model (c) demand rate uniform and production rate finite.

Text Books:

1. Kanthi Swaroop , P.K Gupta and Man Mohan , "Operations Research", 4th edition,2001.

Reference Books:

1. P.K.Gupta and Man Mohan "Problem solving in Operations Research", Sultan Chand,1990.
2. A.Taha Handy,"Operations Research", Macmillan Publishing company,Newyork,1997, 6th edition.

1. Foundation in Computer Applications

UNIT-I

Introduction to computer systems: Types of Computers, Characteristics of computers; History of Computer systems, Evaluation and Generation, Basic Anatomy of computer systems: Basic components, Functions of Components, Memory software and hardware components, Input devices and Output devices;
Computer Software: System software and application software: Types of programming languages: Machine level, Assembly level, High level and natural languages;
Operating systems: Introduction and function of OS, Introduction to windows XP and Linux.

UNIT-II

Introduction to MS-Office: MS-Word- Word basics – creating and printing documents – formatting features – mail merge – templates, Macros.
MS-Excel : Excel Basics- creating and printing sheets, formula creation, formatting , menu, command, toolbars, data sort and usage of built-in-function.
MS-Power Point: PowerPoint basics – Navigating, creating and editing power point presentations, slides creation with graphics, animation, pictures, and auto content wizard. Import and Export of documents, slides and worksheets. Indian Language editors either in Windows / I-heap

UNIT-III

Page Maker: Navigating in page maker – PageMaker environment elements, navigating a page maker document, creating a document: Document setup and saving using text using and importing graphics.
Multi-Page Documents: Multi-Page Document setup , Master Pages, Inserting Pages and working with text working with frames : creating Text Frames , formatting Text: Character formatting , Paragraph formatting, working with indents, Tabs and Rules Graphics: working with Text and Graphics, attaching text to a frame.

UNIT-IV
Internet Fundamentals : Introduction to NET and their components, basics definition of LAN, MAN & WAN, Search Engine, Browsing Techniques, Saving , Copying , Downloading .E-mail: Creating of E-mail , Sending E-Mail, Attaching files reading mails forward , compose , save and reply.

TEXTBOOK

1. A First Course in Computers, 2005 Edition, by Sanjay Saxena Vikas Publishing House Pvt. Ltd (For Unit-I, II, IV).

2. PC HARDWARE

UNIT – I

An Inside Look at a Contemporary PC – The Contemporary PC, Disassembly/ Reassembly Notes, Standardized Form Factors.

An Inside Look at Monitors – Monitor assembly, working with On – Screen Controls, Notes on Monitor Disassembly and Reassembly.

UNIT – II

An Inside Look at Operating Systems and the Boot Process – The PC Hierarchy, Understanding popular OS features, A closer look at MS-DOS, The boot process, creating a DOS boot disk, windows 9x/Me maintenance tips

Arranging the preservice checkout – The universal troubleshooting process, Benchmarking the PC, Viruses and computer service, Quick – Start Bench Testing.

UNIT – III

Backup Guide – Backup Considerations, Using Microsoft Backup, Using Backup Exec, Backup Troubleshooting.

BIOS – Typical Motherboard BIOS, BIOS Features, BIOS and Boot Sequences, BIOS Shortcomings and Compatibility Issues, BIOS Troubleshooting, BIOS Upgrades.

Busses – Industry standard Architecture (ISA), Peripheral Component Interconnect (PCI), Accelerated Graphics Port (AGP), General Bus Troubleshooting

UNIT - IV

Conflict Troubleshooting – Understanding System Resources, Recognizing and Correcting Conflicts.

CPU Identification and Troubleshooting – CPU Essentials, Modern CPU Concepts, The Intel CPUs, The AMD CPUs, The VIA Cyrix CUs, CPU Overclocking, Troubleshooting CPU Problems

Data Recovery Techniques – Understanding Data Loss, Protecting Drives and Data, Recovering Files and Folders, Recovering FAT and Discovery Damage, Recovery the MBR, Data Recovery Tips, Data Recovery Troubleshooting.

TEXT BOOK:

1. Troubleshooting, Maintaining & Repairing PCs by Stephen J. Bigelow, 5th Edition.

MSC17203P: OBJECT ORIENTED PROGRAMMING USING JAVA

1. Write a Java Program to accept a year number from the key and test if it is leap or not.
2. Write a Java Program for calculating and displaying area of a circle.
3. Write a Java program to create a push button and add it to a frame.
4. Write a Java program to find the areas of Square and Rectangle by deriving them from Shape.
5. Write a Java program to make cloning Employee class object by writing own myclone() method, from where Object class clone() method is called.
6. Write a Java program for calculating electricity bill for commercial and domestic plans by using abstract class
7. Write a Java program to create an interface that connects to a database and retrieves the data from the database.
8. Write a Java Program to create a package and store Addition class and Subtraction class in it.
9. a) Write a Java program for Multiple Exception Handling.
   b) Write a Java program to throw a User Defined Exception.

10. Write a Java Program to convert int into binary, hexadecimal and octal format.

11. Write a Java Program to Compress and Uncompress the data.

12. Write a Java program for Serialization and De-Serialization of objects.

13. Write a Java program for to synchronize the threads acting on the same object.   Synchronize block can be executed only one thread at a time

14. Write a Java program for Thread Deadlock.

15. Write a Java program for creating Thread Groups.

16. Write a Java program for animates the things using threads.

17. Write a Java program for creating a frame and close it using WindowAdapter class.

18. Write a Java program for drawing a smiling face in a frame with filled colors.

19. Write a Java program to display an image in the frame and also in the title bar of the frame.

20. Write a Java program to trap the key code and key name typed by the user on the keyboard and display them in a text area.

TEXT BOOK

1. Core JAVA An Integrated Approach by Dr. R. Nageswara Rao, Dreamtech Publication, 2014 Edition.

MSC17204P: SOFTWARE ENGINEERING LAB

1. Develop Library system.
2. Develop Course Registration.
3. Design/Develop a Software application based on the principles of Software Engineering
4. Develop Online Book Shopping.
5. Develop Quiz System.
6. Develop Railway Reservation System
7. Given an application software perform Unit Testing
8. Given an application software perform Regression Testing

MSC17202P: DATA COMMUNIACTIONS AND COMPUTER NETWORKS LAB

1. Implement the data link layer farming methods such as character stuffing and bit stuffing.

2. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP.

3. Write a program for selective report ARQ

4. Write a program using Go Back NARQ method.

5. Implement Dijkstra's algorithm to compute the Shortest path thru a graph.

6. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table art each node using distance vector routing algorithm

7. Take an example subnet of hosts. Obtain broadcast tree for it.

MSC17208S : SEMINAR

VIKRAMA SIMHAPURI UNIVERSITY, NELLORE
DEPARTMENT OF COMPUTER SCIENCE

Course Structure for Master of Computer Science for V.S. University Constituent College(s) and Affiliated Colleges under the jurisdiction of Vikrama Simhapuri University, Nellore with effect from 2017-18 Academic Year

Semester	Paper Number	Title of the Paper	Core/ Generic Elective / Open Elective	Credits	L	T	P	Total	Sess. Max. Marks	Univ Max. Marks	Total Marks
Third Semester	MSC17301	Artificial Intelligence	Core	4	3	1	0	4	30	70	100
	MSC17302	Web Technologies	Core	4	3	1	0	4	30	70	100
	MSC17303	Computer Graphics	Core	4	3	1	0	4	30	70	100
	MSC17304	1. Advanced Java Programming 2. .Net Technologies 3. Programming using PHP 4. Software Testing	Generic Elective	4	3	1	0	4	30	70	100
	MSC17305	1. Advanced Database Management 2. Data Ming & Data Warehousing 3. Cryptography & Network Security 4. Multimedia	Generic Elective	4	3	1	0	4	30	70	100
	MSC17306	Courses offered by other Departments	Open Elective	2	0	0	0	0	0	100	100
	MSC17302P	Web Technologies Lab		2	0	0	4	4	30	70	100
	MSC17303P	Computer Graphics Lab		2	0	0	4	4	30	70	100
	MSC17304P	Elective Lab		2	0	0	4	4	30	70	100
Total				**28**	**15**	**5**	**12**	**32**	**240**	**660**	**900**

VIKRAMA SIMHAPURI UNIVERSITY:: NELLORE

Syllabus for Master of Computer Science for V.S. University Constituent College(s) and Affiliated Colleges under the jurisdiction of Vikrama Simhapuri University, Nellore with effect from 2017-18 Academic Year

MSC17301: ARTIFICIAL INTELLIGENCE

UNIT-I:

Introduction about Artificial Intelligence(AI), Problem and search-What is AI Technique, Criteria for success, Problems Space and Search, State Space Search, Production systems, Problem Characteristics, Production system Characteristics.

UNIT-II:

Heuristic search techniques, knowledge representation issues, Prediction logic, Resolution principle, Representing knowledge using rules, forward vs backward reasoning, semantic reasoning under uncertainty-Non monotonic reasoning, Statistical reasoning. Different knowledge representation schemes-Semantic nets, Minsky's frames. Conceptual dependency theory, scripts, Waltz's algorithm.

UNIT-III:

Natural Language processing-Overview of linguistics, Grammars and languages, Basic parsing techniques, Transitional networks, Semantic analysis and representation structures, Natural language generation, Natural language systems; General concepts in knowledge acquisition-types of learning, General learning model, Performance measures.

UNIT-IV:

Expert system architecture- Characteristic feature of expert systems, History, Applications, Rule based system architecture, Expert system shells; Pattern recognition-The recognition and classification process, Learning classification patterns, Recognizing and understanding speech; Perceptio0n and Action; Features of AI Programming Language PROLOG.

TEXT BOOKS:

1. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata Mcgraw Hill 2nd edition, 2002.
2. Dan W.Patterson, "Introduction to Artificial Intelligence & Expert Systems" , PHI, 1999.

REFERENCE BOOKS:

1. Patrick Hendry Winston, "Artificial Intelligence", 3rd edition, PHI, 1999.
2. George F. Luger, "Artificial Intelligence- Structured and strategies for complex problem solving" , Pearson education, 4th edition, 2001.

MSC17302: WEB TECHNOLOGIES

UNIT – I

Internet Language, Understanding HTML, Create a Web Page, Linking to other Web Pages, Publishing HTML Pages, Text Alignment and Lists, Text Formatting Fonts Control, E-mail Links and link within a Page, Creating HTML Forms with HTML 5 controls, Tables, Using Style Sheets.

UNIT – II

 JavaScript, Control Structures, Functions,
Introduction to Scripting – Control Statements – I, Control Statements – II – Functions - Arrays – Objects: String, Math, Boolean and Number object , Document object.

UNIT – III

Event Handling, DOM: Introduction, DOM Nodes and Trees, Traversing and Modify a DOM tree, DOM Collections, Dynamic styles

UNIT - IV

Introduction, XML Basics,Structuring Data, XML Namespaces , Document Type Definitions (DTDs), W3C XML Schema Documents, XML Vocabularies, MathML, Other Markup Languages,Extensible Stylesheet Language and XSL Transformations,

TEXT BOOK:

1. Internet & World Wide Web- H. M. Deitel, P.J. Deitel, A. B. Goldberg - 5th Edition

REFERENCE BOOKS

1. 	 Programming World Wide Web by RW Sebesta (Pearson)
2. 	An Introduction to Web Design+Programming by Wang & Katia(Pearson)
3. 	HTML & XML An Introduction NIIT(PHI)
4. 	HTML for the WWW with XHTML & CSS by Wlizabeth Castro(Pearson)
5. 	Fundamentals of the Internet an the World Wide Web by Raymond Green Law and Ellen Hepp (TMH)
6. 	Internet and Web Technologies by Raj Kamal (TMH)
7. 	Internet and Web Basics by Ned Snell, Bob Temple, TM Clark (Pearson)

MSC17303: COMPUTER GRAPHICS

UNIT-I

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices

Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms.Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms

UNIT-II

2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems

2-D viewing : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrusbeck line clipping algorithms, Sutherland – Hodgeman polygon clipping algorithm

UNIT-III

3-D object representation : Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations. 3-D viewing : Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping

UNIT-IV

Visible surface detection methods : Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods

TEXT BOOKS:

1. "Computer Graphics C version", Donald Hearn and M.Pauline Baker, Pearson Education
2. "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.

REFERENCE BOOKS:

1. "Computer Graphics", second Edition, Donald Hearn and M.Pauline Baker, PHI/Pearson Education.
2. "Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc-Graw hill edition.
3. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.
4. "Principles of Interactive Computer Graphics, "Neuman and Sproul, TMH.
5. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.
6. Computer Graphics, Steven Harrington, TMH

ELECTIVE: MSC17304 - 1. ADVANCED JAVA PROGRAMMING

UNIT – I

JAVA2 ENTERPRISE EDITION OVERVIEW – The ABC of Programming Languages, Taking Programming Languages Up a Notch, The Beginning of Java, Java Bytecode, The Advantages of Java, J2EE and J2SE

J2EE MULTI –TIER ARCHITECTURE – Distributive Systems, The Tier, J2EE Muti – Tier Architecture, Client Tier Implementation, Web Tier Implementation, Enterprise JavaBeans Tier Implementation, Enterprise Information Systems Tier Implementation, Challenges

J2EE BEST PRACTICES - Enterprise Application Strategy, The Enterprise Application, Clients, Sessions Management, Web Tier and JavaServer Pages, Enterprise JavaBeans Tier, The Myth of Using Inheritance, Maintainable Classes, Performance Enhancements, The Power of Interfaces, The Power of Threads, The Power of Notification

J2EE DESIGN PATTERNS AND FRAMEWORKS – The Pattern Concept, Pattern Catalog

UNIT – II

J2EE DATABASE CONCEPTS - Data, Database, Database Schema, The art of Indexing.

JDBC OBJECTS - 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

JDBC AND EMBEDDED SQL - Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data from a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Subqueries, View.

UNIT – III

JAVA AND XML – Generating an XML Document, Parsing XML, Quick Reference Guide.

JAVA SERVLETS – Java servlets and Common Gateway Interface Programming, A Simple Java Servlet, Anatomy of a Java servlet, Reading Data from a Client, Reading HTTP Request Headers, Sending Data to a Client and Writing the HTTP Response Header, Working with Cookies, Tracking Sessions

JAVA SERVERPAGES – JSP, JSP Tags, Tomcat, Request String, User Sessions, Cookies, Session Objects

UNIT – IV

ENTERPRISE JAVABEANS – Enterprise JavaBeans, Deployment Descriptors, Session Java Bean, Entity Java Bean, Message – Driven Bean, The JAR File

JAVA INTERFACE DEFINITION LANGUAGE AND CORBA – The Concept of Object Request Brokerage, Java IDL and CORBA, The IDL Interface, The Client Side, The Server Side, Running the Code.

JAVA REMOTE METHOD INVOCATION – Remote Method Invocation Concept, Server Side, Client Side

TEXT BOOK

1. The Complete Reference J2EE by Jim Keogh, Tata McGraw – Hill Edition

UNIT - I

FUNDAMENTALS OF VISUAL BASIC, Exception handling, windows forms, Control Classes, Different Types of Boxes, Labels, Buttons, Panels. (Chapters 1 to 7)

UNIT - II

WINDOWS FORMS: Different types of Bars, Menus, Views.
OBJECT - ORIENTED PROGRAMMING: Classes and objects constructors and distructors, inheritance, modifiers, Interfaces, Polymorphism, Vate Binding, Graphics handling and File handling. (Chapters 8 to 13)

UNIT - III

WEB FORMS: Working with webforms, Web forms and HTML, The Web control class, Web Forms and Boxes, Web Forms and Buttons, Validation Controls, Ad Rotators, Web Forms and HTML controls. (Chapters 14 to 19)

UNIT - IV

DATA ACCESS WITH ADO.NET : Accessing data with the server explorer, Data adapters and Data sets, Binding Controls to databases,   Handling databases in code, Database access in Web Applications. Creating user Controls, Web user Controls, and Multithreading creating Windows services, Web Services and Deploying applications. (Chapters 30 to 25)

TEXT BOOK :

1. VB.NET PROGRAMMING (BLACK BOOK) BY STEVEN HOLZNER (Dreamtech- 3003)

REFERENCE BOOKS:

1. VB.NET PROGRAMMING BY T. GADDIS (Dreamtech)
2. Microsoft Visual Basic. Net step by step By Halvosrson (PHI)
3. OOP with Microsoft Visual Basic.Net By Reynold Hacrtte (PHI)

UNIT I
Introduction to PHP: The problem with other Technologies (Servelets and JSP), Downloading, installing, configuring PHP, Programming in a Web environment and The anatomy of a PHP Page.
Overview of PHP Data types and Concepts: Variables and data types, Operators, Expressions and Statements, Strings, Arrays and Functions.

UNIT II
Overview of Classes, Objects, and Interfaces: Creating instances using Constructors, Controlling access to class members, Extending classes, Abstract classes and methods, using interfaces, Using class destructors, File Handling and Using Exceptions.

UNIT III
PHP Advanced Concepts: Using Cookies, Using HTTP Headers, Using Sessions, Authenticating users, Using Environment and Configuration variables, Working with Date and Time.

UNIT IV
Creating and Using Forms: Understanding Common Form Issues, GET vs. POST, Validating form input, Working with multiple forms, and Preventing Multiple Submissions of a form.
PHP and Database Access: Basic Database Concepts, Connecting to a MYSQL database, Retrieving and Displaying results, Modifying, Updating and Deleting data. MVC architecture.

TEXT BOOKS:
1. Beginning PHP and MySQL, 3rd Edition , Jason Gilmore, Apress Publications (Dream tech.).
2. PHP 5 Recipes A problem Solution Approach Lee Babin, Nathan A Good, Frank M.Kromann and Jon Stephens.

REFERENCES:
1. Open Source Web Development with LAMP using Linux ,Apache, MySQL, Perl and PHP, J.Lee and B.Ware(Addison Wesley) Pearson Education.
2. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, Cengage Learning Publications.
3. PHP 5.1, I. Bayross and S.Shah, The X Team, SPD.
4. PHP and MySQL by Example, E.Quigley, Prentice Hall(Pearson).
5. PHP Programming Solutions, V.Vaswani, TMH.

ELECTIVE: MSC17304 – 4. SOFTWARE TESTING

UNIT – I

Software Quality Assurance – The Software Crisis, the Birth of Software Engineering, what is Software Engineering, Why Software Engineering, Is the Software Crisis overcome, The Software Chaos, Criteria for the success of a Software Project, Process – Oriented software Development, Phases in Software Development Life Cycle, Software Development Life Cycle Models, The Management Processes, Software Quality Assurance, Quality Management Systems, Process Change Management

UNIT – II

Software Testing process – Psychology of Testing, Verification and Validation, Testing team and Development Team, Cost of Quality, Characteristics of Test Engineers, Why Testing is Difficult, Levels of Testing, Testing Approaches, Types of Testing, Test Plan, Criteria for Completion of Testing, Software Reliability, Manual Testing and its Limitations/Drawbacks.

Software Testing Tools: An Overview – Need for Automated Testing Tools, Taxonomy of Testing Tools, Functional/Regression Testing Tools, Performance Testing Tools, Testing management Tools, Source Code Testing Tools, How to Select a Testing Tool

UNIT – III

WinRunner – Overview of WinRunner, Testing an Application using WinRunner, Test Script Language (TSL), GUI MAP File, Synchronization of Test Cases, Data-Driven Testing, Rapid Test Script Wizard, Mapping Custom Object to a Standard class, Checking GUI Objects.
Silk Test – Overview of Silk Test, Architecture of Silk Test, Testing an Application Using Silk Test, The 4Test Scripting Language, Checkpoints, Data-Driven Test Cases.
SQA Robot – Overview of SQA Robot, Testing an Application using SQA Robot, Synchronization of Test Procedures, Creating Checkpoints.

UNIT – IV

JMeter – Jmeter Overview, JDBC Test, HTTP Test
TestDirector – TestDirector Overview, Testing Management Process, Managing the Testing Process Using Test Director

TEXT BOOK
1. Software Testing Tools by Dr.K.V.K.K. Prasad, 2010 Edition.

MSC17305: Elective - 1. ADVANCED DATABASE MANAGEMENT SYSTEMS

U N I T – I

Enhanced Entity-Relationship And Object Modeling: Subclasses, Super classes, and Inheritance, Specialization and Generalization, Constraints and Characteristics of Specialization and Generalization, Modeling of UNION Types Using Categories, An Example UNIVERSITY ERR Schema and Formal Definitions for the ERR Model, Conceptual Object Modeling Using UML Class Diagrams, Relationship Types of Degree Higher Than Two, Data Abstraction and Knowledge Representation Concepts Relational Database Design Using ER-to-Relational Mapping, Mapping ERR Model Concepts to Relations

U N I T – II
Concepts For Object-Oriented Databases: Overview of Object-Oriented Concepts, Object Identity, Object Structure, and Type Constructors, Encapsulation of Operations, Methods, and Persistence, Type Hierarchies and Inheritance. Overview of the Object Model of ODMG, the Object Definition Language. Object-Relational Features of Oracle, An Overview of SQL3, Implementation and Related Issues for Extended Type Systems, The Nested Relational Data Model.

UNIT - III

Storage And Indexing: Overview of Storage And Indexing - Data on External Storage, File organizations and Indexing, Index Data Structures, Comparison of File Organizations.
STORING DATA: DISKS AND FILES - The Memory Hierarchy, Redundant Arrays of Independent Disks, Disk Space Management, Buffer Manager, Files of Records, Page Formats, Record Formats.
(Chapters 8, 9 of text book 2)

UNIT – IV

Tree - Hash Indexing: Tree - Structured Indexing - Intuition for Tree Indexes, Indexed Sequential Access Method (ISAM), B+ Trees: A Dynamic Index Structure, Search, Insert, Delete, Duplicates, B+ Trees in Practice.
Hash-Based Indexing - Static Hashing, Extendible Hashing, Linear Hashing, Extendible vs. Linear Hashing.

TEXT BOOKS

1. Fundamentals of DataBase Management Systems by Navate & Elmasri (IV Edition)
2. DataBase Management System (III Edition) by Raghu Ramakrishna and J.Gehrke

REFERENCE BOOKS

1. Fundamentals of Database Systems by - ELMASRI & NAVATHE (PEARSON EDUCATION 3002) , 3rd Edition.
2. Database System Concepts (IV Edition) by - Silber Schatz, Korth G. Sudarshan (TMH 3002)
3. Database Management Systems By - Alexi's Leon And Mathews Leon (LION VIKAS -3002)
4. Database Management Systems - Gerald. V. Post, 2nd Edition
5. Modern Database Management by - F.R.Mc.Fadden, J.A.Hoffer, M.B.Prescott (Addison Wisley 3000), 4th Edition
6. Database Management by - pratt and j.j. Adamski (thomson education-3002)
7. Database Application Development & Design-Manino (McGraw Hill), 3rd Edition
8. Database Systems Connoly, Begg (Pearson)
9. Database System Implementation – Garcia, Molna, Ullman, Widon (Phi)
10. A First Course in Database Systems - Ullman, Windon (Pearson)
11. Database Systems, ROB. Coronel, Thomson Technology.
12. Database Systems Connoly, Begg (Pearson)
13. Database System Implementation – Garcia, Molina, Ullman, Widon (PHI)
14. A First Course In Database Systems - Ullman, Windon (Pearson)

UNIT - I: Data Mining & OLAP Technology for Data Mining

What is Data Mining, Data Mining Functionalities, and classification, Data Mining Task, Integrating a Data Mining System, Major issues in Data Mining, Descriptive Data Summarization, and Data Cleaning, Data Integration and transformation, Data reduction, Data Discrimination and concept Hierarchy Generation?

UNIT - II: Data Warehousing & OLAP Technology

. What is Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse implementation, From Data Warehouse to data mining, Efficient methods for Data Cube Computation, feature development of data cube and OLAP technology, Attribute – oriented Induction.

UNIT - III: Data Mining Patterns Association and Correlations

Basic Concepts of frequent patterns, Frequent Item sets, mining methods, Association rules, what is classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Association mining to correlation analysis, Constraint based association mining.

U N I T – IV: Data Mining Methods

Classification by back propagation, support vector, machines and other classification methods, What is Cluster analysis, types, Partitioning methods, Hierarchical methods, Density Based methods, Grid Based methods, and Model-Based Clustering methods, Outlier analysis, Graph mining, Social network analysis and multidimensional data mining

TEXT BOOK:
1. Data Mining Concepts & Techniques By Jiaeei Han, Micheline & Kamber (2nd Edition) Harcourt India (Elsevier Publishing Company)

REFERENCE BOOKS:

1. Data Mining Introductory and advanced topics –MARGARET H DUNHAM, PEARSON EDUCATION
2. Data Mining Techniques – ARUN K PUJARI, University Press.
3. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.
4. Data Warehousing Fundamentals – PAULRAJ PONNAIAH WILEY STUDENT   EDITION
5. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT EDITION
6. DATA WAREHOUSING, DATA MINING & OLAP BY ALEX BERSON AND STEPHEN J. SMITH (TMH)
7. Data Warehousing by S Mohanthy (TMH)
8. Data Warehousing using Oracle by Deshpande (Dreamtech)
9. Data Warehousing by Amitesh Sinha (Thomson)
10. Data Mining by P Adriaans & D Zantinge (Pearson)
11. Data Mining by S M Sivanandam & S Sumathi

ELECTIVE: MSC17305 - 3. CRYPTOGRAPHY & NETWORK SECURITY

UNIT - I

Introduction:- Attacks, Services, and Mechanisms, Security Services.
Conventional Encryption: Classical Techniques: Steganography, Classical Encryption Techniques.
Conventional Encryption: MODERN TECHNIQUES:- Simplified DES, The Data Encryption Standard, Differential and Linear Cryptanalysis, Block Cipher Modes of Operation, Triple DES, Blowfish.

UNIT - II

Confidentiality Using Conventional Encryption:- Traffic Confidentiality, Random Number Generation.
Public-Key Crptography:- Principles of Public-Key Cryptosystems, The RSA Algorithm, Diffie-Hellman Key Exchange, Elliptic Curve Cryptography.
Introduction To Number Theory:- Prime and Relatively Prime Numbers, Fermat's and Euler's Theorem, Euclid's Algorithm, The Chinese Remainder Theorem, Discrete Logarithms, Hash functions, Security of hash functions and MACs.

UNIT - III

Digital Signatures And Authentication Protocols:- Digital Signatures, Authentication Protocols, Digital Signature Standard.
E-Mail Security:- Complete Email system, Email Security, Pretty Good Privacy(PGP), MIME, S/MIME.

UNIT - IV

IP Security: IP Security Overview, IP Security Architecture, Encapsulating Security Payload, Key Management. FIREWALLS: Firewall Design Principles, Trusted Systems.
Web Security: Web Security Threats, Web Traffic Security approaches, Security Socket Layer, SSl Record Protocol, Transport layer security, Secure Electronic Transaction(SET)

TEXT BOOK:

1. Cryptography And Network Security principles and Practice FOURTH Edition By Willam Stallings (Pearson Asia)

REFERENCE BOOKS:

1. Davies & Price : Security For Computer Networks - Wiley (1984)
2. Network Security and Cryptography, N. Sridhar & R.Siva Ranjani, HI – Tech Publishers (2005)
3. Mayer & Matyas : Cryptography – Wiley B. Schneier : Applied Cryptography - (John Wiley)
4. Cryptography In C And C++ :Weischanbach – A Press
5. Cryptography Mystified: Hershey
6. Introduction to cryptography BY J A Buchanan (Springer)

UNIT- I:
Fundamental concepts in Text and Image:
Multimedia and hypermedia, world wide web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

UNIT- II:
Fundamental Concepts in Video and Digital Audio:
Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

UNIT- III
Multimedia Data Compression:
Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zero tree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).
Basic Video Compression Techniques:
Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.

UNIT-IV
Multimedia Networks:
Basics of Multimedia Networks, Multimedia Network Communications and Applications: Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG- 4, Media-on- Demand (MOD).

TEXTBOOK:
1. Fundamentals of Multimedia , Ze-Nian Li , Mark S. Drew, PHI/ P

MSC17302P: WEB TECHNOLOGIES LAB

1. a) Write a HTML5 Program to create hyperlinks to four websites.

  b) Write a HTML5 Program to link an email address.

2. Write a HTML5 Program to include images to web pages.

3. Write a HTML5 Program to create complex table.

4. Write a HTML5 Program to insert special characters in the document.

5. Write a HTML5 Program to adding background images and indentation using CSS

6. Write a HTML5 Program to link an internal style sheet.

7. Create an simple animator of an image that moves in a diamond pattern as its changes opacity.

8. Write a HTML5 Program to skewing and transforming elements in CSS.

9. Write a HTML5 Program to add an image and float the text around the image

10. Write a HTML5 Program to multi column text layout.

11. Write a HTML5 Program to create website registration form with optional survey.

12. Create an auto complete input element with an associated data list that contains days of the week.

13. Write a HTML5 Program to absolute positioning of an element.

14. Link HTML5 page to extend CSS file.

15. Draw a rectangle with a border on a canvas.

MSC17303P: COMPUTER GRAPHICS LAB

1.   Write a program to implement DDA algorithm for generating lines.

2.   Write a program to implement Bresenhams Midpoint Line generation algorithm.

3.   Write a program to implement Bresenhams Midpoint Circle generation algorithm.

4.   Write a program to implement Bresenhams Midpoint Ellipse generation algorithm.

5.   Write a program to implement Flood Fill algorithm.

6.   Write a program to boundary Fill algorithm.

7.   Write a program to implement 2d Translation transformation.

8.   Write a program to implement 2d Rotation transformation.

9.   Write a program to implement 2d Scaling transformation.

10.   Write a program to implement Cohen Sutherland line clipping algorithm.

11.   Write a program to implement fundaments shapes?

12.   Write a program to implement 3d Translation transformation.

13.   Write a program to implement 3d Rotation transformation.

14.   Write a program to implement 3d Scaling transformation.

MSC17304P: MCA17304 Elective Lab

VIKRAMA SIMHAPURI UNIVERSITY, NELLORE
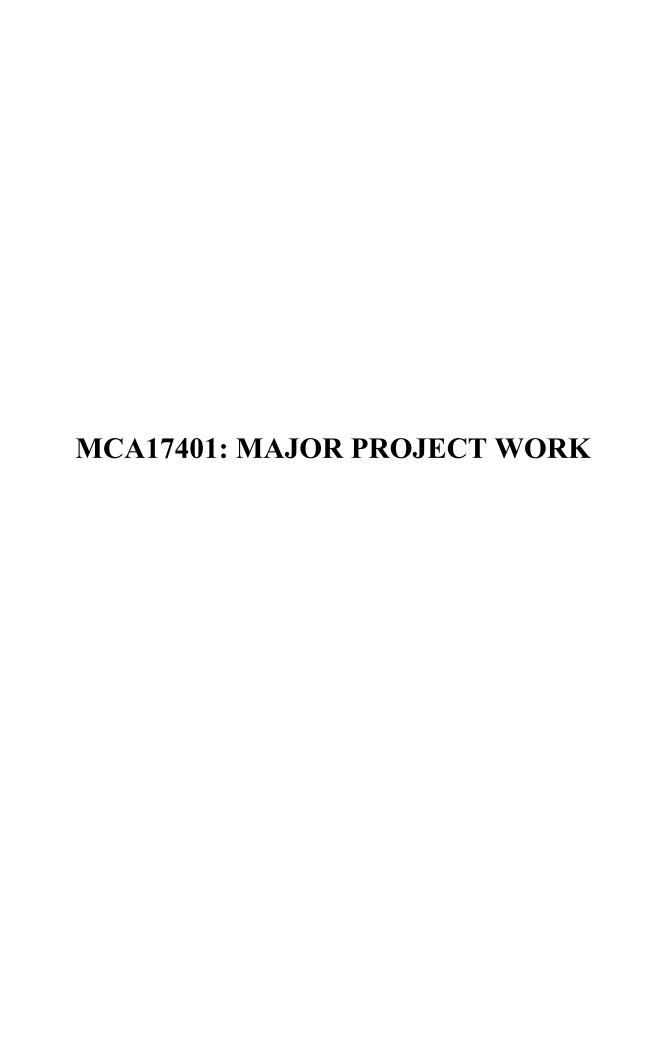## DEPARTMENT OF COMPUTER SCIENCE

Course Structure for Master of Computer Science for V.S. University Constituent College(s) and Affiliated Colleges under the jurisdiction of Vikrama Simhapuri University, Nellore with effect from 2017-18 Academic Year

Semester	Paper Number	Title of the Paper	Core/ Generic Elective / Open Elective	Credits	L	T	P	Total	Sess. Max. Marks	Univ Max. Marks	Total Marks
Fourth Semester	MSC17401	Major Project Work		12	0	0	0	0	100	200	300
	MSC17402	Courses offered by other Departments	Open Elective	2	0	0	0	0	0	100	100
		Total		**14**	**0**	**0**	**0**	**0**	**100**	**300**	**400**

S.No	Semester	Credits	L	T	P	Total	Sess. Max. Marks	Univ Max. Marks	Total Marks
1	First Semester	28	17	5	12	34	270	630	900
2	Second Semester	30	17	5	14	36	320	630	950
3	Third Semester	28	15	5	12	32	240	660	900
4	Fourth Semester	14	0	0	0	0	100	300	400
	Total	**100**	**47**	**15**	**38**	**100**	**900**	**2250**	**3150**

Open Elective

Second Semester	**Courses offered to other Departments by the Computer Science Department** 1. Information and Communication Technology 2. PC Hardware & Office Automation Techniques 3. Internet Foundation

MCA17401: MAJOR PROJECT WORK

Each course examination shall have a maximum of 70 Marks and the examination shall be of 3 hours duration.

The question paper shall have two Sections viz. Section- A and Section B.

<u>Section-A</u>

Answer any FOUR questions from Part –A each question carries 5 Marks   4X5M = 20M

(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)

<u>Section-B</u>

Answer all questions from Part –B each question carries 12.5 Marks   4X12.5M = 50M

UNIT – I

9. (a)
       or
   (b)

UNIT - II

10. (a)
       or
   (b)

UNIT - III

11. (a)
       or
   (b)

UNIT – IV

12. (a)
       or
   (b)