Detailed Syllabus
M.Sc. (Computer Science)

Duration: Two Year

First Year Syllabus

S. No.	Paper Code	Paper
1	1DMCS1	Fundamentals of Maharishi Vedic Science (Maharishi Vedic Science – I)
2	1DMCS2	Programming Fundamental (Using C)
3	1DMCS3	Operating System Concepts
4	1DMCS4	System Analysis And Design
5	1DMCS5	Data Structure & File Structure (Using C)
6	1DMCS6	Computer System Architecture
7	1DMCS7	Computer Networks
8	1DMCS8	RDBMS (Using Oracle)
9	1DMCS9	Computer Lab I - Data Structure Using C
10	1DMCS10	Computer Lab II - RDBMS (Using Oracle)

1DMCS1	Fundamentals Of Maharishi Vedic Science (Maharishi Vedic Science – I)
UNIT-I	Meaning of Guru Pujan, Name of 1-20 areas of Vedic Science & their expression in Human Physiology, detail with diagram,Consciousness – Characteristics and types.
UNIT-II	Maharishi's Yoga – Principles of Yoga Asans , A general Introduction of TM, TM & TM Sidhi Program,Types of Speech
UNIT-III	Third law of Thermodynamics, Miessiner Effect, Maharishi Effect
UNIT-IV	Introduction to Maharishi's Vedic Swasthya Vidhan, Theories of Dincharya & Ritucharya, Theories of Ayurved.
UNIT-V	Theory of Invincibility. Introduction to Maharishi Jyotish.

Reference Books

- Maharishi Sandesh -1and 2 -His Holiness Maharishi Mahesh Yogijee
- Scientific Yoga Ashanas –Dr.Satpal.
- Chetna Vigyan- His Holiness Maharishi YogiJee.
- Dhyan Shailly by Brahmchari Dr. Girish Ji

1DMCS2	Programming Fundamental (Using C)
UNIT-I	**An overview:** Problem identification, analysis, design, coding, testing & debugging, implementation, modification & maintenance; algorithms & flowcharts; Characteristics of a good program - accuracy, simplicity, robustness, portability, minimum resource & time requirement modularization; Rules/ conventions of coding, documentation, naming variables; Top down design; Bottom-up design.
UNIT-II	**Fundamentals of C Programming:** History of C; Structure of a C Program; Data types; Constant & Variable, naming variables; Operators & expressions; Control Constructs - if-else, for, while, do-while; Case switch statement; Break, continue, exit(), goto & labels, Arrays; Formatted & unformatted I/O; Type modifiers & storage classes; Ternary operator; Type conversion & type casting; Priority & associativity of operators.
UNIT-III	**Modular Programming:** Functions; Arguments; Return value; Parameter passing - call by value, call by reference; Return statement; Scope, visibility and lifetime rules for various types of variable, static variable; Calling a function; Recursion - basics, comparison with iteration, types of recursion- direct, indirect, tree and tail recursion, when to avoid recursion, examples.
UNIT-IV	**Advanced Programming Techniques:** String; Pointer v/s array; Pointer to pointer; Array of pointer & its limitation; Function returning pointers; Pointer to function, Function as parameter; Structure -basic, declaration, membership operator, pointer to structure, referential operator, self referential structures, structure within structure, array in structure, array of structures; Union - basic, declaration; Enumerated data type; Typedef; command line arguments.
UNIT-V	**Miscellaneous Features:** File handling and related functions; printf & scanf family; C preprocessor- basics, #Include, #define, #undef, conditional compilation directive like #if, #else, #elif, #endif, #ifdef and #ifndef; Variable argument list functions.

Reference Books

- Kerninghan & Ritchie, "The C Programming Language", PHI
- Programming in Ansi C by E. Balaguruswamy, TMH, 2004
- Let us C Yaswant Kanetkar, BPB publications
- Gottfried:"Problem solving in C",Schaum Series
- How to solve it by Computer by R.G. Dromey (P.H.II),1994

1DMCS3	Operating System Concepts
UNIT-I	What is an operating system simple batch systems, Multiprogrammed Batched systems. Time-sharing systems, Personal Computer systems Parallel systems, Distributed and Real Time systems, Computer –system operation, I/O structure, storage structure, storage hierarchy, Hardware Protection, General-system Architecture.
UNIT-II	System components, operating – system services Operating System as resource manager, system calls, system programs, system structure, virtual machines, system design and Implementation, system Generation, Process Concept , Process scheduling, operation on process, Cooperating processes, Interposes communications.
UNIT-III	Basic concept of CPU scheduling, scheduling criteria, scheduling Algorithms, Algorithms evaluation, Process synchronization, the critical section problem, synchronization hardware, semaphores, classical problem of synchronization, Critical regions, monitors, Case studies problem of dead lock in processor management, Methods for handling deadlock.
UNIT-IV	Memory management, logical Vs physical Address space, swapping contiguous, Allocation, paging, segmentations, segmentation with paging, Demand paging performance of demand paging. Replacement Algorithm page, Thrashing, Demand segmentation, secondary-storage structure and Disk scheduling algorithms.
UNIT-V	File-system structure, Access methods, Directory structure, protection, Allocation methods, Free-space management, directory implementation, efficiency and performance, Recovery Goals of protection, Domain of protection, Access matrix implementation of Access matrix.

Reference Books

- Operating System Concept (IVth ed.) by Silbersantz and Galvin (Addition Wesly)
- Operating system Principles By P. B. Hansen, P.H.I.
- An introduction to operating system design N. Haberman, Galgotia publication

1DMCS4	System Analysis And Design
UNIT-I	The System Concept, Characteristics, Elements and Types of a system, System Development Life Cycle, Considerations for candidate systems and Prototyping. The role of System Analyst
UNIT-II	System planning and Initial Investigation Information Gathering, information gathering tools. Structured Analysis, The Tools of Structured Analysis (DFD, Data Dictionary, Decision tree and Pseudo Codes Decision Tables), pros and cons of each tool. System performance definition, description of outputs, Feasibility Study Cost/ Benefit Analysis: Data Analysis, Cost/Benefit Analysis, The system proposal.
UNIT-III	The process and Stages of System Design: Design methodologies, development activities. Input design, output design forms design, types of forms, and basics of form design, layout considerations and forms control.
UNIT-IV	File structure, file organization, objectives of database, data structure. System Testing and Quality Assurance, Why system testing, what do we test for, the test plan quality assurance, trends in testing, role of data processing auditor. Training and Documentation.
UNIT-V	Implementing and software maintenance, Conversion, combating, resistance to change, post implementation review, software maintenance. Hardware/Software Selection and the Computer Contract, suppliers, procedure for hardware/software selection, financial considerations in selection, the computer contract. System Security, Disaster Recovery Planning.

Reference Books

- System Analysis and Design, Elias M. Awad ,Galgotia Publications (P) Ltd.
- System Analysis and Design. Interactional Ed. Perry Edward McGraw Hill Publications.
- Information Technology & Computer Applications, by V.K. Kapoor, Sultan Chand & Sons, Delhi.
- System Analysis and Design, A. Mansoor, Pragya Publication.

1DMCS5	Data Structure And File Structure (Using C)
UNIT-I	Information and its storage representation, nature of information, transmission of information, storage of information, primitive data structure, operations on data structure, integer, real numbers, character information, logical and pointer information, representation and manipulation, storage representation of strings, string manipulation application, text handling analysis.
UNIT-II	Linear Data structure and their sequential representation, Non- primitive data structures, storage structure for arrays, stacks, definition and operations on stacks, application of stack, recursion, polish expressions and their manipulation, Queues, operations on queues, simulation, priority queues, linked storage representation, pointers and linked allocation, linked linear lists, operations on linked lists, circulatory linked list, doubly links list, application of linked lists, polynomial manipulation, linked dictionary, multiple precision arithmetic.
UNIT-III	Nonlinear Data Structures: Trees, definitions and concepts of general trees and binary trees, representation of binary trees, binary tree representation of general tree, binary tree traversal, Threaded binary trees, operation on binary trees, application of trees, binary search trees, evaluation of binary search trees, AVL trees, B.B. trees, M. Way search trees and B-trees, B* trees. (Chapter 8,9,11,12 from Data Management and file Processing by E.S.Lomis) graphs and their representation, matrix representation, list structure, other representation of graphs, Breadth first search, depth first search, application of graphs, dynamic storage management.
UNIT-IV	Sorting and Searching : Notation and concepts, selection sort, bubble sort, merge sort, tree sorts, partition exchange sort, radix sort, address calculation method, Summary of Sorting Methods, Searching Hash-table method, Hashing functions, Collision resolution techniques, external sorting, run list sorting, polyphase sorting, oscillating sorting sorting on disks, generating extended initial runs.
UNIT-V	File Structure: Magnetic tapes, drums, disks, Mass storage devices and their characteristics, record organization, sequential file structure and processing of fixed sequential files (ISAM, direct files, structure and processing, external searching, multi list organization, inverted list organization, controlled list Length, cellular partitioned structures, maintenance of multilist, inverted list, maintenance of constrained list and cellular structures.

Reference Books

- J.P.Trembley & P.G. Sorrenson: An Introduction to Data Structures with Application, Mc-Graw Hill.
- E.S.Loomis: Data Management and File Processing, P.H.I.
- H.W.Sahnis: Fundamentals of Data Structures, Comp. Sc. Press.
- D.E.Knuth : The Art of Computer Programing,Addision Wesly.

1DMCS6	Computer System Architecture
UNIT-I	Data types and number System , Binary number system ,Octal & Hexa-decimal number system , I's& 2's complement ,Binary Fixed –point Representation , Arithmetic operation on Binary number , Overflow & underflow ,Floating Point Representation , codes ,ASCII, EBCDIC codes , Gray code , Gray code ,Excess -3& BCD, Error detection & correction codes.
UNIT-II	Logic Gate , AND , OR NOT gates and their truth tables , NOR, NAND & XOR gate , Boolean Algebra , basic Boolean law's , Demorgan's theorem , MAP simplification , Minimization technique , K-Map , sum of product & product of sum.
UNIT-III	Combination & Sequential circuit , half adder & full adder , full subtractor, Flip –flops RS, D ,JK, & T flip-flops ,shift register , RAM and ROM , Multiplexer , Demultiplexer , Encoder, Decoder, Idea about Arithmetic Circuit , program control , instruction Sequencing.
UNIT-IV	I/O Interface , properties of simple I/O devices and their controller, Isolated versus memory-mapped I/O , Mode of Data transfer, Synchronous and Asynchronous data transfer, handshaking, Asynchronous serial transfer , I/O Processor.
UNIT-V	Auxiliary memory, magnetic Drum , disk & tape ,semi- conductor memories ,Memory Hierarchy , Associative Memory , Virtual Memory ,Address space & Memory Space , Address mapping page tables , page replacement , cache memory , hit ratio , mapping , hit ratio ,mapping technique, Writing into Cache

Reference Books

- Barite, Digital computer fundamental TMH Publication ISBN 0-07-003899-6
- Melvin, Digital computer Electronic TMH Publication ISBN 0-07-462235-8
- Morris Mano, Computer system architecture PHI publication ISBN 81-203-0417-9

1DMCS7	Computer Networks
UNIT-I	Users of Computer Network, Network Hardware, Network software, Protocol Hierarchies, Design issue for the layers, Interfaces and services, connection oriented and connection-less services, service primitives, the relationship of services, to protocols, Reference Models, comparison of OSI and TCP/IP Reference models, Data communication services, SMDS, X.25, Frame Relay, Broadband ISDN, ATM and comparison of services.
UNIT-II	Physical layer, Theoretical Basis for data communication, Bandwidth-limited signals. Maximum Data Rate of a Channel, Transmission media, Magnetic media, Wireless, Transmission, The telephone systems, Narrowband and Broadband ISDN and ATM, communication satellites.
UNIT-III	Data Link layer, Design issues, Services provided to the Network layer, error detection and correction, elementary data link protocols, sliding window protocols, Protocol specification and verification, Case studies, HDLC and the Data link layer in the Internet.
UNIT-IV	Network layer design issues, routing algorithms, the optimality principle, shortest fath routing, Flooding, Flow-based Routing, Distance-vector and link-state routing broadcast and Multicast Routing, Congestion control algorithms, general principles of congestion control, Traffic shaping, choke packets, load shedding, jitter control.
UNIT-V	The transport layer, The transport service, Quality at service, Transport service Primitives, Addressing establishing a connection, Releasing a connection, Flow-Control and Buffering, Multiplexing, crash Recovery, The Internet Transport protocols, TCP service model, TCP protocol, TCP segment header, TCP connection management, TCP transmission policy, TCP congestion control, TCP timer management UDP.

Reference Books

- Computer Networks, third edition, 1997 A.S. Tanenbanm, P.H.I.
- Data and Computer Communication 1996 William Stallings, P.H.I.

1DMCS8	RDBMS (Using Oracle)
UNIT –I	**INTRODUCTION**:Advantages of DBMS approach, various views of data, data independence, Schema & sub-schema, Primary concepts of data models, Database languages, Transaction management, Database administrator & uses, data dictionary, Overall system architecture. ER MODEL: - Basic concept, Design issues, Mapping constraints, Keys, ER diagram, weak & strong entity sets, specialization & generalization, aggregation, inheritance, design of ER schema, Reduction of ER schema to tables.
UNIT-II	**DOMAIN RELATIONS & KEYS**: Domains, Relations, Kinds of relation, relational databases, various types of keys, candidate, primary, alternate & foreign Keys. RELATION ALGEBRA & SQL: The structure, relation algebra with extended operations, Modification of database, idea of relational calculus, Basic structure of SQL, set operation, Aggregate function, Null values, Nested sub queries, Derived relations, views modification of database, Join relations, DDL & SQL .
UNIT –III	**FUNCTIONAL DEPENDENCIES & NORMALIZATION**: Base definitions, Trivial & non-Trivial dependencies, Closure set of dependencies & of attributes, Irreducible set of dependencies, introduction to normalization, Non- loss decomposition, FD diagram of I, II & III NF, Dependencies prevention, BCNF, Multi-valued dependencies prevention's, BCNF, Multi-valued dependencies & ANF, Join dependencies & 4NF. DATABASE INTEGRITY :- General idea, Integrity rules, Domain rules, Attribute rules, Relation rules, Database rule, assertions, triggers, Integrity & SQL.
UNIT-IV	**DISTRIBUTED DATABASES**: Basic idea, distributed data storage, Data replication, Data Fragmentation, horizontal, vertical & mixed fragmentation. EMERGING TRENDS IN DBMS :- Object – Oriented database- Basic idea & the model Object structures Object, Class, inheritance, multiple object identity, Data warehousing terminology, definitions, characteristics, Data mining & its overview, Database on www, multimedia database difference with conventional DBMS, issues, similarity based retrieval continuous media data, multimedia data formats, video servers.
UNIT –V	**NETWORK & HIERARCHICAL MODEL**: Basic idea, Data structure diagram, DBTG model, implementation, Tree structure diagram, Implementation techniques, comparison of three models. **TRANSACTION CONCURRENCY & RECOVERY:** Basic concept, ACID properties, Transaction state, Implementation of atomicity & durability concurrent executions, Basic idea of serializability, Basic idea of concurrency control, Basic idea of deadlock, Failure, classification, storage structure - types, stable storage implementation, data access, Recovery& Atomicity – Log based recovery, deferred database modifications, immediate database modifications, checkpoints.

Reference Books

- Henry F.Korth & A. Silbershatz: Data System Concepts. Mc-GrawHill.
- Arun K. Majumdar & P.Bhattacharya: Data Base Management System. TMH
- Bipin C. Desai: An Introduction to Database System, Galgotia Pub. Co.Ltd.
- Jeffrey O. Ullman: Principles of Database Systems, Galgotia Pub. Co.Ltd.
- James Martin: Principles of Database Management . PHI
- James Martin, Computer Database organization. PHI

Second Year Syllabus

S. No.	Paper Code	Paper
1	1DMCS1	Advanced Concept of Maharishi Vedic Science (Maharishi Vedic Science – II)
2	1DMCS2	Object Oriented Programming Using C++
3	1DMCS3	Software Engineering
4	1DMCS4	Internet And Java Programming With GUI
5	1DMCS5	Principles Of Compiler Design
6	1DMCS6	Artificial Intelligence
7	1DMCS7	.Net Technologies
8	1DMCS8	Data Warehousing And Data Mining
9	1DMCS9	Computer Lab I - Programming Using C++ & Java
10	1DMCS10	Computer Lab II - Programming Using .Net

2DMCS1	Advanced Concept of Maharishi Vedic Science (Maharishi Vedic Science – II)
UNIT–I	Name of 21-40 areas of Vedic Science & their expression in Human Physiology and detail with diagram, Consciousness, types of consciousness, characteristics of higher stages of consciousness.
UNIT-II	Introduction to Maharishi Gandharva Veda, Introduction to Maharishi Sthapatya Ved
UNIT –III	Introduction to maharishi Vedic Management, Fundamental Elements of Vedic management:- Totality, Ideal Management in Indian Society (Ashram Vavstha :Cast, Religious), Management Science and Art.
UNIT-IV	Maharishi Absolute theory of Defence, Maharishi Absolute theory of Development, Maharishi Absolute theory of Information.
UNIT –V	Maharishi's Swasthya Vidhan, Scientific Research based on T.M. & T.M. Sidhi Programme.

Reference Books

- Maharishi Sandesh -1and 2 , II-His Holiness Maharishi Mahesh Yogijee
- Scientific Yoga Ashanas –Dr.Satpal.
- Maharishi Sandesh Part I,II
- Chetna Vigyan His Holiness Maharishi YogiJee.
- Dhyan Shailly by Brahmchari Dr. Girish Ji

2DMCS2	Object Oriented Programming Using C++
UNIT–I	**PRINCIPLES OF OBJECT-ORIENTED PROGARAMMING:** Object Oriented Programming Paradigm, Basic Concepts of Object- Oriented Programming, Benefits of OOPs, Object-Oriented Languages, Applications of OOP, C++ Statements, Class, Structure of C++, Program, Creating the Source File, Compiling and Linking.
UNIT-II	**TOKENS, EXPRESSIONS AND CONTROL STRUCTURES**: Introduction Tokens, Keywords, Identifiers, Basic Data types, User Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Dereferencing Operators, Manipulators, Type Cast Operator, Expressions and Implicit Conversions, Operator Precedence, Control Structures.
UNIT –III	**CLASSES AND OBJECTS**: Specifying a class, Defining Member Function, making an Outside Function Inline, Nesting of Member function, private member function, Arrays within a class, Memory Allocation for Objects, Static Data Member, Static Member Functions, Arrays of Objects, Object as Function Arguments. **CONSTRUCTORS AND DESTRUCTORS**: Introduction, Constructors, parameterized Constructors, Multiple Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructors, Dynamic Constructors and Destructor.
UNIT-IV	**FUNCTIONS IN C++**: The Main Function, Function Prototyping, call by Reference, Return by reference, Inline Functions, Default Argument, Const. Arguments, Function Overloading, Friend and Virtual Function. **OPERATOR OVERLOADING AND TYPE CONVERSIONS**: Introduction, Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators Using Friends, Manipulation of strings using operators, Rules for Overloading Operators, Type conversions.
UNIT–V	**INHERITANCE: EXTENDING CLASSES**: Introduction, Defining Derived Classes, Single Inheritance Making a Private Member Inheritable, Multilevel Inheritance, Multiple Inheritance ,Hierarchical Inheritance, Hybrid Inheritance. **POINTERS, VIRTUAL FUNCTIONS AND POLYMORPHISM**: Compile time Polymorphism, run time polymorphism, Pointers to Objects, This Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

Reference Books

- Object Oriented Programming with C++ by E. Balaguruswami. TMH Publications ISBN 0-07-462038-x
- Object Oriented Programming in C++ by Nabajyoti Barakati SAMS PHI Pvt. Ltd.
- Insights into OOPS & C++. Rajeshwar Shukla, Pragya Publications .

2DMCS3	Software Engineering
UNIT–I	**Software Processes**: Processes projects and products, Component software processes, characteristics of a software process, software Development Process, project management process, software configuration management process, software configuration management process, process management process. **Software requirement Analysis and Specification**: Software requirement, need for SRS, requirement process, problem analysis, analysis issues. Informal approach, structured analysis, object oriented modeling, other modeling approaches, prototyping, requirement specification, characteristics of an SRS, component of an SRS, specification languages, structure of requirement document validation requirement reviews, other method metrics, size measures, quality metrics.
UNIT-II	**Planning Software Project:-** Cost estimation, uncertainties in cost estimation, building cost estimation models, on size estimation, COCOMO model, project scheduling, average duration estimation, project scheduling and milestones, staffing and personnel planning, ayleigh curve, personnel plan, team structure, software configuration management plans, quality assurance plans, verification and validation, project monitoring plans, risk management.
UNIT–III	**Function Oriented Design:-** Design principles, coupling, cohesion, design notation and specification, structured design methodology, verification, network metrics, stability metrics, information flow metrics Software Testing.
UNIT-IV	**Testing Methods:** Software testing fundamentals, test case design, white box testing, control structure testing, black-box testing, testing for specialized environments. **Software Testing Strategies**: A Strategic Approach to software testing, strategic issues, unit testing, validation testing, system testing, the art of debugging.
UNIT–V	**Re-Engineering:** Software re-engineering, software maintenance, software reengineering process model, reverse engineering, reverse engineering user interfaces, restructuring, code restructuring, data restructuring, forward engineering the economics of reengineering. **Client/Server software Engineering:** The structure of client/server systems, software engineering for c/s systems, analysis modeling issues, design for C/S systems, testing issues. **Computer-Aided software Engineering:** What is case, building blocks for case, a taxonomy of case tools, integrated case environments, the integration architecture, the case repository.

Reference Books

- Pressman Roger, Software, Engineering: A Practitioner's Approach Tata McGraw Hill, New Delhi.
- Jalote Pankaj, An Integrated Approach to Software Engineering Narosa, New Delhi.
- R.E. Fairly. Software Engineering Concepts. McGraw Hill, Inc 1985.
- Poyce, Software Project Management, Addison-Wesly.
- Sommerville , Software Engineering, Addison-Wesly.

2DMCS4	Internet And Java Programming With GUI
UNIT–I	Understanding the Internet, what in the Internet, How TCP/IP makes the Internet work, who runs the Internet, Overview of the Internet, Services like E-mail, WWW, FTP, Telnet etc. Domain Name System (DNS), Simple Network Management, Protocols (SNMP),Internet security, Cryptography, Public-key algorithms, Authentication Protocols, Digital Signature, Multimedia, Audio, Video, Data Compression.
UNIT-II	Java History, Java features, How Java differs from C and C++, Java and Internet, Java and WWW, Hardware and Software requirements, Java environments, Simple Java Program, Java Program Structure, Java Tokens, Java statements, Implementations a Java Program, Java virtual machine, Constants, variables and data types.
UNIT –III	Operators and expressions, Arithmetic, Relational, Logical Bitwise operators, operator precedence and Associativity various control flow statement like if ….. else, switch while, do, for etc. classes object and methods, Inheritance extending a Class, Visibility control, Arrays strings and vectors.
UNIT-IV	Interfaces, Multiple inheritance defining Interfaces, extending Interfaces, Implementing Interfaces, Accessing Interface variables, Java API Packages, Naming Conventions, Creating packages, Accessing a package, Adding a class to a package, Hiding classes. Multi threaded programming, Creating threads, extending thread class, life cycle of a Thread, Thread exception, Thread priority.
UNIT–V	Exceptions, exception Handling in Java, Applet programming, Applet life Cycle, creating executable Applet, Applet Tag, Running an applet, passing parameters to applet, Graphics programming, GUI Concepts in Java, managing Input / Output files in Java.

Reference Books

- Programming with JAVA, A Primer. E. Balaguruswamy Publisher: Tata Mc-Graw Hill publication.
- Computer Networks By A.S.Tanenbaum, P.H.I.
- The Complete reference Java 2, 3rd Edi. By Patrick Naaghton, Herbert, Schild Tata Mc-Graw Hill.
- Exploring Java : Patrick Nieaneyer and Joshna Peck O, Reilley S Associates, Inc.
- Hareliy Hahn Teacher the Internets, 1999 By Harley Hahn, P.H.I.

2DMCS5	Principles Of Compiler Design
UNIT–I	Compiler and Translators, why do we need translators, the structure of Compiler, Lexical Analysis, Syntax analysis, Intermediate code generation, Book keeping, error handling.
UNIT-II	Finite Automata and Lexical analysis, The role of the lexical analyzer, regular expressions, finite automata, from regular expression to finite automata, minimizing the number of states of a DFA, A Language for specifying lexical analyzer, implementation of lexical analyzer using lex.
UNIT –III	Context- free grammars, derivation of parse trees, capabilities of CFGs, Parsers, shift-reduce parsing, operators precedence parsing, top -down parsing, Predicitive parsing, LR parsers, The canonical collection of LR (0) items, constructing SLR parsing tables, constructing canonical LR parsing tables, constructing LALR parsing tables, Simple parsing exercises using Yacc.
UNIT-IV	Syntax-directed translations schemes, implementation of syntax directed translators, intermediate code, postfix notation, parse trees and syntax trees, three-address code, quadruples, and triples, translations of assignment statements, Boolean expressions, statements that alter the flow of control, cost fix translations, translation with the top-down parser.
UNIT–V	Symbol tables, the contents of symbol tables, data structures for symbol tables, representing scope information, run time storage administration, implementation of a simple stack allocation schemes, implementation of block structured languages, storage for block - structured languages.

Reference Books

- Principles of Compiler Design by Alfred V. Aho., Jeffrey D. Ulman.
- “Compilers: Principles, Techniques and Tools” Aho, Ravi Sethi, Ullman, Pearson Education, VIII Ed. 2002.
- Lex and Yacc by Johan R. levine, Tonny Mason, et. al. O” Reilly and Assosiates.
- “Compilers Design in C” Allen I. Holub, PHI eastern economy edition 2003.

2DMCS6	Artificial Intelligence
UNIT–I	What is Artificial Intelligence, what is an AI technique, criteria for success, Problems, problem spaces and search, Production system, Problem characteristics, Hill-climbing, Best-First search, AO algorithm, constraint satisfaction.
UNIT-II	Natural language Processing, Introduction, overview of linguistics, Grammars and language, Basic Parsing techniques, Semantic analysis and representation, structure, Natural Language generation, Natural Language systems (Chapter 12, Dan w Paterson).
UNIT –III	Knowledge Representation Issues, Approaches to knowledge Representation, Representing simple facts in logic, computable functions and predicates, Procedural vs declarative knowledge, forward vs Backward Reasoning matching, control knowledge.
UNIT-IV	Expert systems, Rule-Based system architecture Non-production system Architecture, dealing with uncertainty, knowledge acquisition and validation, knowledge system Building tools. (Chapter 15, Dan W Patterson).
UNIT–V	Pattern Recognition, Recognition and classification process, learning classification Patterns, Recognizing and understanding speech.

Reference Books

- Artificial Intelligence Elaine Rich and Kevin Knight Tata Mc-Graw Hill Edition.
- Introduction to Artificial Intelligence and expert system. Dan. W. Patterson Prentic–Hall of India.
- Principles of Artificial Intelligence by Nils J. Nilson (Narosa Publication).

2DMCS7	.Net Technologies
UNIT–I	Introduction to .NET Technology, Introduction to VB.NET, Software development and Visual Basic .NET, Visual Basic .NET and .NET frame.
UNIT-II	Visual Basic fundamentals: The Visual Basic .NET Development . Environment, The element of VB.NET, VB.NET operators, Software design, Conditional structure and control flow, Methods.
UNIT –III	Classes and Objects: Types, Structure and Enumeration, Classes, Interfaces. Exception handling and Classes, Collections, Arrays and . other Data Structure.
UNIT-IV	Advance design concepts, Patterns, Roles and Relationships, Advanced Interface Patterns: Adapters and Delegates and Events Data Processing and I/O.
UNIT–V	Writing Software with Visual Basic .NET, Interfacing with the End User, Introduction to ASP.NET and C#.NET and their features.

Reference Books

- Jeffrey R. Shapiro "The Complete Reference Visual Basic .NET Tata Mcgraw Hill (2002 Edition).
- Rox "Beginner and Professional Edition VB.NET" Tata Mcgraw Hill.
- Steven Holzner "Visual Basic.NET Black Book" Wiley Dreamtech Publication.
- Alex Homer, Dave Sussman "P~ofessional ASP.NET1.1" Wiley' Dreamtech .
- Bill Evzen,Bill Hollis "Professional VB.NET 2003" Wiley Dreamtech .
- Tony Gaddis "Starting Out VB.NET PROG.2nd Edition" Wiley Dreamtech
- Chris Ullman, Kauffman "Beg. ASP.NET1.1 with VB.NET 2003" Wiley Dreamtech
- Chris Ullman, Kauffman "Beg ASP.NET1.1 with VC#.NET 2003" Wiley Dreamtech

2DMCS8	Data Warehousing And Data Mining
UNIT–I	Motivation, importance, Data type for Data Mining :relation Databases, Data Warehouses, Transactional databases, advanced database system and its applications, Data mining Functionalities: Concept/Class description, Association , Analysis classification & Prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis, Classification of Data Mining Systems, Major Issues in Data Mining.
UNIT-II	Data Warehouse and OLAP Technology for Data Mining: Differences between Operational Database Systems and Data Warehouses, a multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Architecture, Data Warehouse Implementation, Data Cube Technology.
UNIT –III	Data Preprocessing: Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation. Data Mining Primitives. Languages, and System Architectures, Concept Description: Characterization and Comparison, Analytical Characterization
UNIT-IV	Mining Association Rules in Large Databases: Association Rule Mining: Market Basket Analysis, Basic Concepts, Mining Single-Dimensional Boolean Association Rules from Transactional Databases: the Apriori algorithm, Generating Association rules from Frequent items, Improving the efficiency of Apriory, Mining Multilevel Association Rules, Multidimensional Association Rules, Constraint-Based Association Mining.
UNIT–V	Classification & Prediction and Cluster Analysis: Issues regarding , classification & prediction, Different Classification Methods, Prediction, Cluster Analysis, Major Clustering Methods, Applications & Trends in Data Mining: Data Mining Applications, currently available tools.

Reference Books

- J., Han and M. Kamber, -Data Mining: Concept and Techniques", Morgan Kaufmann Pub.
- Berson -Dataware housing, Data Mining& DLAP, @004, TMH.
- W.H. Inmon - Building the Datawarehouse, 3ed, Wiley India.
- Anahory, "Data Warehousing in Real World", PearSon Education.
- Adriaans, "Data Mining", Pearson Education.
- S.K. Pujari, -Data Mining Techniques", University Press, Hyderabad.