### Scheme of Teaching and Examinations 2015-2016

**Master of Science in Information Technology**

**First Semester**

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>SUBJECTS</th>
<th>Teaching Load Per Week</th>
<th>Credit (L+ (T+P)/2)</th>
<th>Examination Marks</th>
</tr>
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<tbody>
<tr>
<td>Msc(IT)101</td>
<td>Object Oriented Programming with C++</td>
<td>3 2 - 4</td>
<td>100 50 - 150</td>
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<tr>
<td>Msc(IT)102</td>
<td>Mathematical Foundations Of Computer Science</td>
<td>3 2 - 4</td>
<td>100 50 - 150</td>
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<tr>
<td>Msc(IT)103</td>
<td>Essentials of Information Technology</td>
<td>3 2 - 4</td>
<td>100 50 - 150</td>
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<tr>
<td>Msc(IT)104</td>
<td>Data Structure through algorithms with ‘C’</td>
<td>3 2 - 4</td>
<td>100 50 - 150</td>
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<tr>
<td>Msc(IT)105</td>
<td>Operating System (with Linux as case Study)</td>
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<td>15 10 12 26</td>
<td>500 300 200 1000</td>
<td>200 180 100 480</td>
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</table>
NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I : Introduction to OOP
Advantages of OOP, The Object Oriented Approach, and Characteristics of object oriented languages- Object, Classes, Inheritance, Reusability, and Polymorphism. OMT.

UNIT – II : Language Fundamental

UNIT – III : Structure and Function
Structures : A Simple structures , specify the structures, Defining a structure variable, Accessing structures member. Enumeration data type.


Array: Defining array, array element , initiation array, multi dimensional array, passing array to function.

UNIT – IV : Object Classes and Inheritance
Object and Class, Using the class, class construct, class destructors, object as function argument, struct and classes, array as class member, operator overloading. Type of inheritance, Derive class, Base class. Access specifier: protected. Overriding, member function, String, Templates.

UNIT – V
Pointers and Virtual Function
pointers: & and * operator pointer variables, pointer to void,pointer and array, pointer and function, pointer and string, memory management, new and delete, pointer to object, pointer to pointer, link list. Virtual Function: Virtual Function, Virtual member function, accesses with pointer, Late binding, pure virtual function, Friend function, Friend class, static function, this pointer.

File and Stream
C++ streams, Stream class, string I/O, char I/O, Object I/O, I/O with multiple object, File pointer, Disk I/O,

RECOMMENDED BOOKS :
5. Object Oriented Programming : Blaschek G, Springer Verlag
FIRST SEMESTER : MSc(IT)-102

Mathematical Foundation Of Computer Science

Max Marks : 100
Min Marks : 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I : Mathematical Logic, Sets Relations and functions

**Mathematical Logic** : Notations, Algebra of Propositions & Propositional functions, logical connectives, Truth values & Truth table Tautologies & Contradictions, Normal Forms, Predicate Calculus, Quantifiers.

**Set Theory** : Sets, Subsets, Power sets, Complement, Union and Intersection, De-Morgan's law
Cardinality, relations: Cartesian Products, relational Matrices, properties of relations equivalence relation functions: Injection, Surjection, Bijection, Composition, of Functions, Permutations, Cardinality, the characteristic functions recursive definitions, finite induction.

UNIT – II : Lattices & Boolean Algebra

**Lattices** : Lattices as Algebraic System, Sub lattices, some special Lattices( Complement, Distributive, Modular).

**Boolean Algebra** : Axiomatic definitions of Boolean algebra as algebraic structures with two operations, Switching Circuits.

UNIT – III : Groups Fields & Ring

**Groups** : Groups, axioms, permutation groups, subgroups, co-sets, normal subgroups, free subgroups, grammars, language).

**Fields & Rings** : Definition , Structure, Minimal Polynomials, Irreducible Polynomials, Polynomial roots & its Applications.

UNIT – IV : Graphs

**Graphs** : Simple Graph, Multigraph & Psuedograph, Degree of a Vertex, Types of Graphs, Sub Graphs and Isomorphic Graphs, Operations of Graphs, Path, Cycles and Connectivity, Euler and Hamilton Graph, Shortest Path Problems BFS(Breadth First Search , Dijkstra’s Algorithm, Representation of Graphs, Planar Graphs, Applications of Graph Theory.

UNIT – V : Trees

**Trees** : Trees, Properties of trees, pendant vertices in a tree, center of tree, Spanning tree, Binary tree, Tree Traversal, Applications of trees in computer science.

**BOOKS RECOMMENDED :**

   applications to computer science
FIRST SEMESTER : M. Sc-103

Essentials Of Information Technology

Max Marks : 100
Min Marks : 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I : Introduction –
Basics concept of IT, concept of data and information, Data processing, History of computer, Data processing, organization of computers and input and output device, storage device, and file organization.

UNIT – II : Software concept -
System software, application software, utility package, compilers, and interpreters, operating system, elementary command of DOS, UNIX and WINDOWS (file handling directory, management and general purpose user interfacing command).

UNIT – III : Computer languages –
Machine languages, assembly languages, high level languages, 4th generation languages, general purpose, concept of oops and SQL.

UNIT – IV : Communication and network technology -
Communication and system elements, communication mode (Analog and Digital, Synchronous and Asynchronous, Simplex, Half duplex, Full duplex, circuit switching), communication media (Speed and capacity, twisted pair, coaxial cable, optics, wireless), common network, protocols (ISO/OS, reference model, TCP/IP).

UNIT – V : Internet
Technical foundation of Internet- Client server computing, Distributed Computing, Domain naming system, DNS Server, Internet Security – Fire walls, Encryptions etc.

Internet Applications - E-mail, WWW, E-commerce, Teleconferencing,
Application of Information Technology - State of Art Application of IT, Application of IT in business, Industry, home, education and training entertainment, science and engineering and medicine.

BOOKS RECOMMENDED :
1. Fundamental of Computer - V.Rajaraman
2. Computer today - Sanders D.H
3. Information technology today - S.Jaiswal
FIRST SEMESTER : M.Sc.-104  
Data Structure Through Algorithms

Max Marks : 100  
Min Marks : 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I : Introduction and Preliminaries -  
Introduction, Basic terminology, Elementary data organization, Data structure, Data structure operation, Algorithms : complexity, time-space Tradeoff.. Mathematical Notation and functions, Algorithmic Notation, Control Structures, Complexity of Algorithms, Sub algorithms, Variables, Data Type.

UNIT – II : String Processing, Arrays, Records And Pointers –  
Basic Terminology, Storing String, Character Data Type, String Operations, Word Processing, Pattern Matching Algorithms. Linear Array, Representation of linear Array in Memory, Traversing Linear Arrays, Inserting And Deleting, Sorting; Bubble Sort, Searching; Liner Search, Binary Search, Multidimensional Array, Pointers; Pointer Array, Records; Record Structures, Representation of Records in Memory; Parallel Arrays, Matrices, Sparse Matrices.

UNIT – III : Linked Lists, Stacks, Queues, Recursion -  
Linked list, Representation of linked lists in memory, Traversing a linked list, Searching a linked list, Memory Allocation; Garbage Collection, Insertion into a linked List, Deletion from a Linked List, Header Linked List, Two- Way Linked Lists. Stacks, Array Representation of Stack, Arithmetic Expressions; Polish Notation, Quicksort, an application of Stacks, Recursion, Tower of Hanoi, Implementation of Recursive Procedures by Stacks, Queues, Deques, Priority Queues.

UNIT – IV : Trees & Graphs -  
Binary Trees, Representing Binary Trees in Memory, Traversing binary tree, Traversal Algorithms using stacks, header nodes; threads, Binary Search Tree, Searching and Inserting in Binary Search Tree, Deleting in Binary Search tree, Heap; Heap sort, Path Lengths; Huffmans Algorithms, General Tree. Graph Theory Terminology, Sequential Representation of Graph; Adjacency Matrix, Path Matrix, Linked Representation of Graph.

UNIT – V : Sorting And Searching –  
Sorting, Insertion Sort, Selection Sort, Merging, Merge Sort, Radix Sort, Searching and data modification, hashing.

BOOKS RECOMMENDED :
1. Data Structure - Seymour Lipschutz (Schaum's Series).
NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I
Introduction:
What is operating system, basic concept, terminology, batch processing, spooling, multiprogramming, time sharing, real time systems, protection, multiprocessor system, operating system as resource manager, process viewpoint, memory management, process management, device management and information management, other views of operating system, historical, functional job control language and supervisor service control.

UNIT – II
Memory Management:
Preliminaries of memory management, memory handling in M/C, relocation, swapping and swap time calculation, multiple partitions, partitioned allocation MFT, fragmentation, MVT, compaction, paging, job scheduling implementation of page tables, shared page, virtual memory-overlays, concepts of virtual memory demand page, memory management and performance, page replacement and page replacement algorithms. Allocation algorithms. Storage hierarchy disk and drum scheduling - physical characteristics fcfs scheduling SCAN, short of seek time first disk scheduling algorithms sector queuing.

UNIT – III
Information Management (File System):
File concept, file type, typed based system, disk based system, general model of file system, file directory maintenance, symbolic file system, basic file system, physical file system, file support device directory, access methods free space management contiguous, linked allocation and indexed allocation performances.

Processor Management (CPU Scheduling):
Reviewing of multiprogramming concept, scheduling concept, basic concept, CPU I/O burst cycle process state, PCB (Programme Control Block) scheduling queries, schedulers, scheduling algorithms - performance criteria, first-come - first served shortest job - first priority, preemptive algorithm, round robin, multilevel queues and multilevel feedback queues, algorithm evolution, multiprocessor scheduling, separate system, coordinated job scheduling, master / slave scheduling.

UNIT – IV
Dead Locks:
The dead lock problem - dead lock definition, dead lock detection, detection algorithm usage, dead lock characterization, resource allocation graph, dead lock prevention, mutual exclusion, hold and wait, no preemption and circular wait, dead lock avoidance-bankers algorithm. Recovery from deadlock process termination, resource preemption, combined approach to deadlock handling.

UNIT – V
Device Management:
Dedicated, shared and virtual devices, sequential access and direct access device, channel and control units, I/O schedulers. Introduction to assembly language programming, introduction to I/O programming, introduction to interrupts and their programming.

Unix (Operating System):
History, design principle, programmer interface, user interface, file system, process management, I/O system, interprocess communication.

BOOKS RECOMMENDED:
2. Operating System - Mandinick & Donovan.
# SCHEME OF TEACHING AND EXAMINATIONS 2015-2016

**MASTER OF SCIENCE IN INFORMATION TECHNOLOGY**

## SECOND SEMESTER

<table>
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<tr>
<th>Subject Code</th>
<th>SUBJECTS</th>
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<td>4 100</td>
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<tr>
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<td>Numerical Method &amp; Analysis</td>
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<td>Msc(IT)208</td>
<td>Common Software</td>
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SECOND SEMESTER - M. Sc. (I.T.) 201
Programming in JAVA & HTML

Max Marks: 100
Min Marks : 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I
1. Introduction to java programming

2. Define the Class and interface
   Introducing Classes: Class Fundamentals, Declaring Object, Assigning Object Reference Variables, Defining Methods, method overloading, Using objects as parameter, Constructors, Garbage collection, finalize () method. Inheritance: Inheritance basic, method overloading, object reference this and super, Chaining constructor using this () and super (), Member accessibility modifier: public, protected, default accessibility of member, private protected, private, Package: Define package, CLASSPATH, importing package, Interface: Define an interface, implementing interface, extending interface, variable in interface, Overview of nested class: Top level nested class and interface, Non static inner class, Local class, Anonymous class.

UNIT – II
3. Exception handling and Multithreading
   Exception Handling: Exception types, Uncaught Exception, Using try and catch, multiple catch, nested try block, throw, and throws, finally.
   Multithreading: creating thread, Thread priority, synchronization, thread Scheduler, Running & yielding, sleeping and waking up, waiting and notifying, suspend and resume, miscellaneous method in thread class.

4. Input output, Networking and Fundamental class of java
   Object class, String class, StringBuffer class, Wrapper class, Math class, Collection: Collection interface, List interface, Set interface sorted interface, ArrayList class, LikedList class, TreeSet, Comparator, Vector, Stack.

UNIT – III
5. Applet programming and AWT

6. **Advance features of java**
   - JDBC: JDBC/ODBC Bridge, The Driver manage class, the java.sql package, data manipulation: Insert, Update, Delete Record, Data navigation: ResultSet
   - BDK: What is java Beans, Advantages of java Beans, the Bean Developer Kit, Jar Files, Introspection, Developing a New Bean, Using Bound Properties, Using BeanInfo interface, The java Beans API.

**UNIT – IV**

7. **HTML Basics & Web Site Design Principles**
   - HTML Document Structure-Head Section, Illustration of Document Structure,<BASE> Element,<ISINDEX> Element,<LINK> Element ,META ,<TITLE> Element,<SCRIPT> Element ,Practical Applications, HTML Document Structure-Body Section:-Body elements and its attributes: Background; Background Color; Text; Link; Active Link (ALINK); Visited Link (VLINK); Left margin; Top margin ,Organization of Elements in the BODY of the document: Text Block Elements; Text Emphasis Elements; Special Elements -- Hypertext Anchors; Character-Level Elements; Character References ,Text Block Elements: HR (Horizontal Line); Hn (Headings) ; P (Paragraph); Lists; ADDRESS ; BLOCKQUOTE ; TABLE ; DIV (HTML 3.2 and up) ; PRE (Preformatted); FORM ,Text Emphasis Elements, Special Elements -- Hypertext Anchors ,Character-Level Elements: line breaks (BR) and Images (IMG),Lists ,ADDRESS Element, BLOCKQUOTE Element, TABLE Element ,COMMENTS in HTML ,CHARACTER Emphasis Modes, Logical & Physical Styles ,Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER.

**UNIT – V**

8. **Image, Internal and External Linking between WebPages**
   - Netscape, Microsoft and Advanced Standard Elements List, FONT, BASEFONT and CENTER Insertion of images using the element IMG (Attributes: SRC (Source), WIDTH, HEIGHT, ALT (Alternative), ALIGN),IMG (In-line Images) Element and Attributes; Illustrations of IMG Alignment, Image as Hypertext Anchor, Internal and External Linking between Web Pages Hypertext Anchors, HREF in Anchors, Links to a Particular Place in a Document, NAME attribute in an Anchor, Targeting NAME Anchors, TITLE attribute, Practical IT Application Designing web pages links with each other, Designing Frames in HTML. Practical examples.

9. **Creating Business Websites with Dynamic Web Pages**
   - Concept of static web pages and dynamic web pages, Introduction to scripting, Types of Scripting languages, Scripting Files, Client Side Scripting with VB/Jscript/JavaScript, Practical examples of Client side scripting. Identifying Objects & Events, and Creating & Implementing Common Methods,. Hosting & promotion of the web site, Domain Name Registration, Web Space allocation, Uploading / Downloading the website- FTP, cute FTP. Web Site Promotion Search Engines, Banner Advertisements.

**Reference Book:**

1. The Complete Reference Java 2 - Herbert Schildt, Publisher- TMH
2. A Programmer Guide to Java - Khild A. Mughal, R.W. Rasmussen Publisher- Addison Wesley
4. Web Enabled Commercial Application Java 2 - Ivan Bayross Publisher- B.P.B.
NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I

Representation of Information
Number system, Integer & Floating point representation Character code (ASCII, EBCDIC), Error Detect and Correct code, Basic Building Blocks, Boolean Algebra, MAP Simplification, Combination Blocks, Gates, Multiplexers, Decoders, etc Sequential building block, flip-flop, registers, counters, ALU, RAM etc.

UNIT – II

Register transfer language and micro operations
Concepts of bus, data movement along registers, a language to represent conditional data transfer, data movement from its memory, arithmetic and logical operations along with register transfer timing in register transfer

UNIT – III

Basic Computer Organization and Design
Instruction code, Computer Instructions, Timing and Control, Execution of Instruction, Input and Output Interrupt, Design of Computer.

Computer Software

UNIT – IV

Input –Output Organization

UNIT – V

Memory Organization
Auxiliary Memory, Micro Computer Memory, Memory Hierarchy, Associative Memory, Virtual Memory, Cache Memory, Memory Management Hardware.

BOOKS RECOMMENDED :
SECOND SEMESTER - M. Sc. (I.T.) 203

RDBMS & ORACLE

Max Marks : 100
Min Marks : 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I
Overview of Database Management -
Data, Information and knowledge, Increasing use of data as a corporate resource, data processing versus data management, file oriented approach versus database oriented approach to data management; data independence, database administration roles, DBMS architecture, different kinds of DBMS users, importance of data dictionary, contents of data dictionary, types of database languages. Data models: network, hierarchical, relational. Introduction to distributed databases, Client/Server databases, Object-oriented databases, Object-relational databases, Introduction to ODBC concept.

UNIT – II
Relational Model -
Entity - Relationship model as a tool for conceptual design-entities attributes and relationships. ER diagrams; Concept of keys: candidate key, primary key, alternate key, foreign key; Strong and weak entities, Case studies of ER modeling Generalization; specialization and aggregation. Converting an ER model into relational Schema. Extended ER features, Introduction to UML, Representation in UML diagram (Class Diagram etc.).

UNIT – III
Structured Query Language
Relational Algebra: select, project, cross product different types of joins (inner join, outer joins, self join); set operations, Tuple relational calculus, Domain relational calculus, Simple and complex queries using relational algebra, stand alone and embedded query languages, Introduction to SQL constructs (SELECT…FROM, WHERE… GROUP BY… HAVING… ORDERBY…), INSERT, DELETE, UPDATE, VIEW definition and use, Temporary tables, Nested queries, and correlated nested queries, Integrity constraints: Not null, unique, check, primary key, foreign key, references, Triggers. Embedded SQL and Application Programming Interfaces.

UNIT – IV
Relational Database Design-
Normalization concept in logical model; Pitfalls in database design, update anomalies: Functional dependencies, Join dependencies, Normal forms (1NF, 2NF, 3NF). Boyce Codd Normal form, Decomposition, Multi-Valued Dependencies, 4NF, 5NF. Issues in physical design; Concepts of indexes, File organization for relational tables, De-normalization, Clustering of tables, Clustering indexes.

UNIT – V
Introduction to Query Processing and Protecting the Database

Data Organization -
File Organization: -Fixed length records, variable length records, Organization of records in files, Indexing: - indexed files -B-tree, B+-tree, and Hashing Techniques.

BOOKS RECOMMENDED :
1. Database system concept - H. Korth and A. Silberschatz, TMH
2. Data Base Management System - Alexies & Mathews [ Vikas publication]
3. Data Base Management System - C. J. Date [Narosha Pub.]
4. Data Base Management System - James Matin
5. Principles of Database System - Ullman
NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Simple/Scientific calculators are allowed.

UNIT – I

Solution of Polynomial and Transcendental Algebraic Equations

UNIT – II

Simultaneous Equations and Matrix
Gauss-Jordan method, Cholesky’s method, Reduction to lower or upper Traingular forms, Inversion of matrix, method of partitioning, Characteristics equation of matrix, Power methods, Eigen values of matrix, Transformation to diagonal forms.

UNIT – III

Curve-Fitting from Observed Data
Divided difference table for evenly or unevenly spaced data, polynomial curve-fitting - Newton’s, Gauss and Langranges form of interpolation and Divided Differences, method of least square for polynomials.

UNIT – IV

Numerical Differentiation and Integration

UNIT – V

Solution of Differential Equations

BOOKS RECOMMENDED
1. Garewal - Numerical methods
2. Gupta & Mallic: Numerical Methods
4. Conle S.D.: Elementary numerical analysis
Carl De Boor (International Book Company London)
Iyengar S.R.K calculations (John Willey & Sons)
SECOND SEMESTER - M. Sc. (I.T.) 205
Computer Networks And Data communication

Max. Marks: 100
Min Marks: 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I
Introduction to Computer Networking

The OSI and TCP/IP Reference Model
The Concept of Layered Architecture, Design Issues for the Layers. Interfaces and services, Detailed Functions of the Layers. Comparison between OSI and TCP/IP Reference model.

UNIT – II
Transmission of Digital Data

Multiplexing and Switching
The Concept of Multiplexing- FDM, TDM, WDM. The Concept of Switching- Circuiting, Message switching, Packet switching.

UNIT – III
Data Link Layer and Routing Algorithms

UNIT – IV
Transport Layer
The Concept of client and Server in terms of Socket addressing in Transport layer. Two way and three-way handshaking. TCP header.

ATM
The concept of ATM, ATM Adoption layers- AAL1, AAL2, AAL3/4, AAL5. Comparison of AAL protocols. Cell formats for UNI and NNI. Service Categories, Quality of service, Congestion Control in ATM.

UNIT – V
Comparative study of Networking Technologies
X.25, Frame Relay, ATM, SONET, SMDS, ISDN.

Network Security
The Importance of Security in Networking. Traditional Cryptography, Data Encryption Standards, RSA algorithm.

BOOKS RECOMMENDED
1. Computer Networks– A S Tanenbaum
2. Data Communication and Networking- Forouzan
1. Running the Diagnostic utility for NIC provided with the Driver Floppy/CD.
2. Demonstration of UTP Flat and Cross Cable Crimping.
4. Installation of Windows 2000 server along with Common Software Installations.
11. Interconnectivity with Windows 98, Linux 8.0.
13. Installation of Oracle 8i on 2000 Server and Network Client on WIN98 and Connectivity between them.
M.Sc.(IT) – 208 Common Software - Programming In Visual Basic

1: Introduction to visual Basic
Editions of Visual Basic, Event Driven Programming, Terminology, Working environment, project and executable files, Understanding modules, Using the code editor window, Other code navigation features, Code documentation and formatting, environment options, code formatting option, Automatic code completion features.

2: Creating Programs
Introduction to objects, Controlling objects, Properties, methods and events, Working with forms, Interacting with the user: MsgBox function, InputBox function, Code statements, Managing forms, Creating a program in Visual Basic, Printing.

3: Variable and Procedures
Overview of variables, Declaring, Scope, arrays, User-defined data types, constants working with procedures, Working with dates and times, Using the Format function, Manipulating text strings.

4: Controlling Program Execution
Comparison and logical operators, If…Then statements, Select Case Statements looping structures, Using Do…Loop structures, For…Next statement, Exiting a loop.

5: Working with Controls
Types of controls, Overview of standard controls, Combo Box and List Box, Option Button and Frame controls Menu, Status bars, Toolbars, Advanced standard controls, ActiveX controls, Insertable objects, Validation.

6: Error Trapping & Debugging
Overview of run-time errors, error handling process, The Err object, Errors and calling chain, Errors in an error-handling routine, Inline error handling, Error-handling styles, General error-trapping options Type of errors, Break mode Debug toolbar, Watch window, Immediate window, Local window, Tracing program flow with the Call Stack.

7 Sequential and Random Files:
Saving data to file, basic filling, data analysis and file, the extended text editor, Random access file, the design and coding.

8: Data Access Using the ADO Data Control
Overview of ActiveX data Objects, Visual Basic data access features, Relational database concepts Using the ADO Data control to access data, Overview of DAO, RDO, Data Control, structured query language (SQL), Manipulating data Using Data Form Wizard.

9: Report Generation:
Overview of Report, Data Report, and Add groups, Data Environment, Connection to database Introduction to Crystal Report Generator.

10: Advances Tools:
Overview of drag and drop, Mouse events, Drag and drop basics, Date Time Control, Calendar, Print Dialog, MDI (Multiple Document Interface).

BOOK RECOMMENDED:
Mastering Visual Basic 6 Fundamentals – By Microsoft
Mastering in Visual Basic – By BPB Publications.
Introduction to VB Programming – V.K.Jain
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<tr>
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<td>AI &amp; Expert System</td>
<td>3 2 - 4 100 25 - 125 40 15 - 55</td>
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<td>Msc(IT)302</td>
<td>Introduction to .Net Technology</td>
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<td>Software Engineering</td>
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<td>Electives: 1. Mobile Communication 2. Artificial Neural Network &amp; fuzzy logic</td>
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THIRD SEMESTER : M.Sc.(IT) – 301

Artificial Intelligence And Expert Systems

Max. Marks: 100
Min Marks: 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I

General Issues and overview of AI :
The AI problems; What is an AI technique; Characteristics of AI applications

Problem solving, search and control strategies :
General problem solving; production systems; control strategies: forward and backward and backward chaining Exhaustive searches: Depth first Breadth first search

UNIT – II

Heuristic Search techniques :
Hill climbing; Branch and Bound technique; Best first search and A* algorithm; AND/Or Graphs; problem reduction and AO* algorithm; constraint satisfaction problems

Game playing :
Minimax search procedure; Alpha-Beta cutoffs; Additional Refinements

UNIT – III

Knowledge Representation :
First order predicate calculus; Skolemization Resolution principle and unification; Inference Mechanisms; Horn’s clauses; semantic Networks; frame systems and value inheritance. Scripts; conceptual dependency;

AI Programming Languages :
Introduction to Lisp, Syntax and Numeric functions; List manipulation functions; Iteration and Recursion; Property list and Arrays, Introduction to PROLOG.

UNIT – IV

Natural language processing :
Parsing technique; context—context-free grammar; Recursive Transition Nets (RTN); Augmented Transition Nets ((ATN); case and logic grammars; semantic analysis.

Planning :
Overview- An example Domain: The Blocks Word; Component of planning systems: Goal Stack Planning (linear planning); Non-linear planning using goal sets; probabilistic reasoning and Uncertainty; probability theory; Bayes Theorem and Bayesian networks; certainty factor.

UNIT – V

Expert Systems :
Introduction to expert systems and Applications of expert systems; various expert system shells: vidwan; frame work; knowledge acquisition; case studies; MYCIN.

Learning :
Role learning; learning by induction; Explanation based learning.

MAIN READING:
THIRD SEMESTER : M.Sc.(IT) – 302
Introduction to .NET Technology

Max. Marks: 100
Min Marks: 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT - I : Inside the .NET framework :
Overview of .net framework, Managed Execution process, CLR, common language specification, JIT Compilation, MSIL, Namespaces, Assemblies, metadata, Common Type System, cross language, interoperability, Garbage collection.

UNIT - II : Programming with .NET Framework
Windows form : working with Visual Studio IDE, creating a .NET solution, MDI application, components and controls, Data types, variables, Type conversions, Operators, Control Structures : conditional statements, loops, arrays, types of methods, method data, Introduction to exception handling-exception statements.

UNIT - III : XML, Windows process and File Handling
Types, structures, Enumerations, classes, Interfaces, Working with files-Files and directories, streams, Readers and writers, Reading and writing XML files, XML serialization, processing Transaction, Monitoring and Managing Windows Process, retrieving information about process.

UNIT - IV : Building .NET Framework Applications

UNIT - V : Advanced concepts and Database Programming
Delegates, ADO .NET Architecture, .NET data provider, dataset components, creating database applications using Window forms and web forms (Database connectivity through ADO .NET), Introduction to web services, web services for Mobile application, Remote overview.

BOOKS RECOMMENDED
MSDN online – by Microsoft
NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I

Software Engineering Fundamentals:
Definition of software product; software development paradigms; software engineering; knowledge engineering and end user development approaches.

Software Analysis:
Abstraction; partitioning and projection; system specification; software requirements specification (SRS) standards; formal specification method; specification tools; flow based, data based and object orientated analysis.

UNIT – II

Systems Design:
Idealised and constrained design; process oriented design (Gane and Sarson and Yourdon notations); data oriented design (Warnier – (Orr, E-r modeling); Object oriented design (Booch approach); Cohesion and coupling; Design metrics; design documentation standards.

UNIT – III

Role of Case Tools:
Relevance of case tools; High-end and low–end case tools; Automated support for data dictionaries, data flow diagrams, entity relationship diagrams.

Coding And Programming:
Choice of programming languages; mixed language programming and call semantics; Re-engineering legacy systems; coding standard.

UNIT – IV

Software Quality And Testing:
Software quality assurance; types of software testing (white box, black box, unit, integration, validation, system etc); debugging and reliability analysis; program complexity analysis; software quality and metrics; software maturity model and extensions. Software cost and Time estimation. Functions points; issues in software cost estimation; introduction to the Rayleigh curve; algorithmic cost model (COCOM0, Putnam-slim, Watson and felix); Other approaches to software cost and size estimation (software complexity, Delphi, costing by analogy)

UNIT – V

Software Project Management:
Planning software projects; work background structures; integrating software, software design and project planning; software project teams; project monitoring and controls.

RECOMENDED BOOKS:
THIRD SEMESTER : M.Sc.(IT) – 304
Elective -1 : Data Mining & Data Warehousing
Max. Marks: 100
Min Marks: 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I
Introduction & Data Warehousing and OLAP Technology for Data Mining – What is data mining?, Data Mining: On what kind of data?, Data mining functionality, Are all the patterns interesting?, Classification of data mining systems, What is a data warehouse?, A multi-dimensional data model, Data warehouse architecture, Data warehouse implementation, Further development of data cube technology, From data warehousing to data mining. Concept of Transaction, Transactional database, Distributed Database, Commit Protocols.

UNIT – II
Data Preprocessing ,Data Mining Primitive , Languages and System Architecture - Why preprocess the data?, Data cleaning ,Data integration and transformation, Data reduction , Discrimination and concept hierarchy generation, Data Mining Primitive, Data Mining Query Language, Architecture of data mining system.

UNIT – III
Mining Association Rules in Large Databases – Association rule mining, Mining single-dimensional Boolean association rules from transactional databases, Mining multilevel association rules from transactional databases, Mining multidimensional association rules from transactional databases and data warehouse, From association mining to correlation analysis, Constraint-based association mining.

UNIT – IV Classification and Prediction & Cluster Analysis -
What is classification? What is prediction?, Issues regarding classification and prediction, Classification by decision tree induction, Bayesian Classification, Classification by back propagation, Classification based on concepts from association rule mining, Other Classification Methods ,Prediction, Classification accuracy, What is Cluster Analysis?, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.

UNIT – V
Mining Complex Types of Data & Applications and Trends in Data Mining
Multidimensional analysis and descriptive mining of complex data objects, Mining spatial databases, Mining multimedia databases, Mining time-series and sequence data, Mining text databases, Mining the World-Wide Web, Data mining applications , Data mining system products and research prototypes, Additional themes on data mining, Social impact of data mining, Trends in data mining.

RECOMENDED BOOKS: 1. Data Mining: Concepts and Techniques - Jiawei Han and Micheline Kamber
2. Data Mining Concepts - H. Marget
NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT I:
Introduction - Feng’s and Flynn’s classification scheme, Multiprocessor and Multicomputer, UMA, NUMA, COMA, NORMA, memory models, parallel computer and its type. Applications of Parallel Computers.

UNIT II:
System Interconnect Architecture – Static and Dynamic, Hypercube Interconnection network, multistage interconnection networks-architecture and routin, design consideration, throughput delay, blocking and non-blocking properties. Performance Metrics and Benchmarks.

UNIT III:
Principle of pipelining-overlapped parallelism, Linear and non-linear pipelining, reservation table, calculation of MAL. Types of Instruction Pipeline. Arithmetic pipeline designs example –Floating point adder, pipelined multiplier.

UNIT IV:
Advanced processor Technology – RISC, CISC, VLIW architectures, Hazard detection and resolution, functional organization of instruction in IBM 360/91.

UNIT V:

TEXT BOOKS:

REFERENCE BOOKS:
NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

UNIT – I
Introduction.
Introduction to Mobile Communication, Short history of wireless communication, Applications, Vehicles, Emergency, Business, Replacement of wired network, Location dependent services, infotainment, Mobile and Wireless devices, A Simplified reference model, some open research topics in mobile communication

UNIT – II
Satellite Systems
History of satellite system, Applications of satellite systems, Type of satellite systems, characteristics of satellite systems, satellite system infrastructure, satellite system architecture, Global Positioning system (GPS), Limitations of GPS. Beneficiaries of GPS, Applications of GPS

UNIT – III
Mobile Communication Systems
Introduction, Cellular System Infrastructure, Registration, Handoff Parameters and Underlying support, Roaming Support Using System Backbone, to Mobile IP, Functions of Mobile IP, Mobile Node, Corresponding Node, Home Network, Foreign Network, Home Agent, Foreign Agent, Care-of Address, IP Packet Delivery, Agent Discovery, Agent Solicitation, Registration, Tunneling, Dynamic host configuration protocol

UNIT – IV
Wireless LANs and PANs
Introduction to IEEE 802.11, Ricochet, Ricochet Wireless Modem, Services Provided by Ricochet, Home RF, Home RF Technology, Hiper LAN, Blue tooth, Advantages and disadvantages of Wireless LAN, Infra red vs radio transmission, introduction to MAC. Technologies influence WLANs / WPANs in future.

UNIT – V
Mobile Adhoc Network

RECOMMENDED BOOKS:
1. Mobile Communication: Jochen H. Schiller, Pearson Education Publication
2. Introduction to Wireless and Mobile Systems: D.P. Agrawal, Qing-An Zing, Vikas Publishing House
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