SCHEME OF TEACHING AND EXAMINATIONS 2018-2019
MASTER OF SCIENCE IN INFORMATION TECHNOLOGY

FIRST SEMESTER

Subject Code	SUBJECTS	Teaching Load Per Week			Credit L+ (T+P)/2	Examination Marks							
						Max. Marks				Min. Marks			
		L	T	P		Th	Ses	Pr	Total	Th	Ses	Pr	Total
MSc(IT)101	Object Oriented Programming with C++	3	2	-	4	100	50	-	150	40	30	-	70
MSc(IT)102	RDBMS and SQL	3	2	-	4	100	50	-	150	40	30	-	70
MSc(IT)103	Mathematical Foundations of Computer Science	3	2	-	4	100	50	-	150	40	30	-	70
MSc(IT)104	Computer System Architecture	3	2	-	4	100	50	-	150	40	30	-	70
MSc(IT)105	Internet and Web Technology	3	2	-	4	100	50	-	150	40	30	-	70
MSc(IT)106	Programming Lab C++	-	-	3x2	3	-	25	100	125	-	15	50	65
MSc(IT)107	RDBMS & SQL Lab	-	-	3x2	3	-	25	100	125	-	15	50	65
	TOTAL	15	10	12	26	500	300	200	**1000**	200	180	100	**480**

03-08-2018

FIRST SEMESTER
Object Oriented Programming with 'C++ '
Subject Code – MSc(IT)101

Max Marks : 100 **Min Marks : 40**

UNIT - I : Language Fundamental

Overview of OOP: The Object Oriented paradigm, Basic concepts of OOP, Benefits of OOP, Object oriented languages,Application of OOP

Overview of C++: History of C++, Data Types: Built-in data types, User-defined data types, Derived data types. Constants and Variables: symbolic constants, Dynamic initialization of variable, Reference variable. Operators in C++.Control Structures:if-else, nested if-else, while, do-while, for, break, continue, switch, goto statement.

UNIT - II : Structure & Function

Structures: A Simple structure,Defining a structure variable, Accessing structures member, Enumeration data type.

Function: Function Declaration, Calling Function, Function Definition, *Passing Arguments to function :* Passing Constant, Passing Value, Reference Argument, Structure as argument, Default Argument.

Returning values from function: return statement, Returning structure variable, Return by reference. Overloaded Function, Inline Function,Templates.

UNIT - III : Object Classes and Inheritance

Object and Class, Defining the class and its member, Making an outside function inline, nesting of member function, array as class member, structure and classes.

Memory allocation: memory allocation for objects, new and delete operator, static datamember, static member functions, object as function argument.

Constructor & Destructor: Null and default constructor. Parameterized constructor, Constructor with default argument, copy constructor , class destructors,

Inheritance: Introduction to inheritance, Types of inheritance ,function overriding, Constructor in Derived class. **Access specifiers:**public,private,protected.

UNIT - IV : Pointers, Virtual Function and Operator Overloading

Pointers: Introduction,& and * operator, pointer to object, this pointer , pointer to derived class.

Dynamic polymorphism: Virtual function, Pure Virtual Function, Abstract class.

Static Polymorphism: Operator keyword,overloading unary operator(++(pre increment and post increment),--) using operator function, overloading binary operators (+,-,==,>=,<=, +=,<,>,[]), Friend function, Friend class, overloading binary operators using friend function.

UNIT - V :File & Stream

File and Stream: C++ Stream class, unformatted I/O operations, formatted console I/O, manipulators, opening and closing a file,detecting eof, file modes, get(), put(),reading and writing a class object, Updating a file random access.

RECOMMENDED BOOKS :

Object Oriented Programming with C++ : *E. Balagurusamy*, The McGraw-Hill
Object Oriented Programming: *McGregor and Sykes S A*, 1992 Van Nostrand.
The C++ Programming Language: *BjarneStroustrup*,AddisionWasley.
Object Oriented Programming in C++ :*Robert Lafore*, Galgotia Publications.
Introduction to Object Oriented Programming :*K V Witt*, Galgotia Publications.
Object Oriented Programming: *G Blaschek*, Springer Verlag
Object Data Management: *R Cattel*, Addison Wasley.

03-08-2018

FIRST SEMESTER
RDBMS and SQL
Subject Code - MSc(IT)102

Max Marks : 100 **Min Marks : 40**

UNIT - I: Overview of Database Management

Data, Information and knowledge, Increasing use of data as a corporate resource, data processing verses data management, file oriented approach verses 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 & Relational Algebra

Entity - Relationship model as a tool for conceptual design-entities, attributes and relationships. ER diagrams; Concept of keys; 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.).

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.

UNIT - III: SQL and Relational Database Design

Introduction to SQL constructs (SELECT...FROM, WHERE... GROUP BY... HAVING... ORDERBY....), INSERT, DELETE, UPDATE, DROP, 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. 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, Denormalization, Clustering of tables, Clustering indexes.

UNIT - IV: PL/SQL

Introduction to PL/SQL variables - literals - data types - advantages of PL/SQL; Control statements : if ; iterative control - loop, while, for , goto ; exit when; Cursors : Types - implicit, explicit - parameterized cursors - cursor attributes; Exceptions: Types - internal , user-defined , handling exceptions - raise statement; PL/SQL tables and records: Declaring PL/SQL tables - referring PL/SQL tables, inserting and fetching rows using PL/SQL table, deleting rows; records - declaration of records - deleting records; Sub programs: Functions - procedures - in, out, inout parameters; purity functions - packages - package specification - advantages of packages - private and public items - cursors in packages.

UNIT - V: Query Processing and Optimization

Query Processing, Protecting Database and Data Organization -Parsing, translation, optimization, evaluation and overview of Query Processing. Protecting the Data Base - Integrity, Security and Recovery. Domain Constraints, Referential Integrity, Assertion, Triggers, Security & Authorization in SQL. **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**: *A. Silberschatz , H.F. Korth and S. Sudarshan*, TMH
2. **Fundamentals of Database Systems**: *Elmasri&Nawathe*, Pearson Education
3. **An Introduction to Database Systems**: *C. J. Date*, AWL Publishing Company
4. **SQL, PL/SQL**: *Ivan Bayross*, BPB Publication
5. **An Introduction to database systems**: *Bipin Desai*, Galgotia Publication.
6. **Database Management System**: *A. K. Majumdar& P.Bhattacharya*, TMH

FIRST SEMESTER
Mathematical Foundations of Computer Science
Subject Code - MSc(IT)103

Max Marks : 100 **Min Marks : 40**

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), Dijkastra'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:

A text book of Discrete Mathematics: *Swapan Kumar Sarkar.*S.Chand& company Ltd.
Discrete Mathematical structure with applications to computer science: *J.P Trembly& R. Manohar.* TMH
Discrete Mathematics: *K.A Ross and C.R.B Writht.*
Discrete Mathematics Structures for computer science: *Bernard Kohman& Robert C. Bushy.*
Discrete Mathematics: *Seymour Lipschutz Mare Lipson.*TMH Edition.

FIRST SEMESTER
Computer System Architecture
Subject Code - MSc(IT)104

Max Marks : 100 **Min Marks : 40**

UNIT – I Representation of Information and H/w component:

Number system (decimal, BCD, octal, hexadecimal) and conversions, r and r-1's complement, Fixed and Floating point representation, Binary codes: Excess-3, ASCII, EBCDIC, Error detection codes. Boolean Algebra, Map simplification K-Map, Logic Gates, **Combinational Circuit:** Half and Full Adder, Decoder and Multiplexer; **Sequential Circuit:** Flip-Flop (SR, D, JK, Master-Slave,T), 4 bit Register, Register with parallel load, Shift register,Binary ripple Counter,Binary synchronous counter.

UNIT – II Register transfer language and micro operations

Register Transfer Language (RTL), Concepts of bus, Bus and Memory transfers,**Micro-operation:** Arithmetic, Logic and Shift micro operation,Instruction code, Computer registers, Computer instructions, Timing and control, Instruction Cycle and Interrupt Cycle, Memory reference instructions, Input-output and interrupt, Design of basic computer

UNIT – III Programming Computers and CPU

Machine Language, Assembly Language, Assembler, Program Loops, Input /Output, Programming,General register organization, Stack organization, Instruction format, Addressing modes, Data transfer and manipulation language, Micro-programmed and Hardwired control, RISC Vs. CISC, **Pipelining in CPU design:**, Parallel Processing, Arithmetic and RISC pipelining.

UNIT – IV Computer Arithmetic and I/O Techniques: Addition, Subtraction, Division and Multiplication Algorithm, Input-Output Interface, asynchronous data transfer; **Modes of transfer:** Programmed I/O, Interrupt Mechanism, Direct Memory Access (DMA), I/O Processor.

UNIT – V Memory Organization

Memory hierarchy: Static and Dynamic RAM, ROM; Building large memory using chips, Associative Memory: associative mapping, Direct mapping, set associative mapping; Cache Memory Organization, Virtual Memory.

BOOKS RECOMMENDED:

1. Computer System Architecture, Morris Mano ,PHI, 3rd Edition)
2. Computer Organization and Architecture ,William Stalling (PHI), 2000
3. Computer organization and Architecture ,J.P.Hayes (TMH), 3rd Edition.
4.Digital Computer Logic Design , Morris Mano ,PHI,3rd Edition
5.Computer System Architecture and organization,Dr.M. Usha,T. S. Shrikant,Wiley publication.
6. Digital Computer Electronics - Malvino.
7. Structured Computer Organization - Andrew M. Tanenbanm (PHI).

03-08-2018

FIRST SEMESTER
Internet and Web Technology
Subject Code - MSc(IT)105

Max Marks : 100 **Min Marks : 40**

UNIT - I

Introduction to Computer and Hardware: Introduction of Information Technology, History of Computers, Organization of computers, Number Systems, Programming language and types, Public domain software, Applications of Information Technology in business, industry, entertainment, science, engineering and medicine.

UNIT - II

Internet and its Application: Evolution of internet, Internet applications, TCP/IP, Addressing in Internet (IP), Domains, Internet service providers, Connectivity such as dial up, leased line, VSAT. E-mail protocols (X-400, SMTP, UUCP), Description of E-Mail headers, Email routing , e-mail client, POP-3, IMAP- 4.

UNIT - III

FTP and Telnet: Introduction to File Transfer Protocol(FTP), Types of FTP servers (including anonymous), Telnet protocol, Telnet client, Terminal emulation. Usenet and Internet relay chat, Web publishing tool, Website planning, Website Hosting , Multiple sites on one server, Maintaining a web site, WWW servers, HTTP & URLs, Registration of website on search engines , maintenance of website.

UNIT - IV

Dynamic HTML and Web Designing: HTML Basic concepts, Web designing issue, Structure of HTML documents, HTML Elements: Core attributes, Language attributes, Core Events, Block Level Events, Text Level Events, Linking Basics, Linking in HTML, Images and Anchors, Anchor Attributes, Image Maps, Semantic Linking Meta Information, Image Preliminaries, Image Download issues, Images as Buttons, Introduction to Layout: Backgrounds, Colors and Text, Fonts, Layout with Tables, Introduction to CSS.

UNIT - V

Internet Security: Internet security vulnerability and threats, Firewalls, Introduction to AAA, Malwares. **E-Commerce**: Introduction, Concepts & technology, Advantages, Limitations, Various electronics payment system, Payment Gateways, Introduction to EDI.

BOOKS RECOMMENDED:

- **Computers Today**, S.K.Basadra ,Galgotia Publication.2nd edition.
- **Internet for Every One** , Alexis Leon and Mathews Leon, Tech World.2008 print.
- **Introduction to Computers**, P.K.Sinha ,BPB Publication, 6th edition.
- **Fundamentals of Computers**, V.Rajaraman ,Prentice Hall of India,4th edition.
- **HTML Complete Reference**, Thomas A. Powell, TMH
- **Frontiers of Electronics of Commerce** , Ravi kalakota & Andrew B. Whinston Addison Wesley ,1196

SCHEME OF TEACHING AND EXAMINATIONS 2018-2019

MASTER OF SCIENCE IN INFORMATION TECHNOLOGY

SECOND SEMESTER

Subject Code	SUBJECTS	Teaching Load Per Week			Credit L+(T+P)/2	Examination Marks							
						Max. Marks				Min. Marks			
		L	T	P		Th	Ses	Pr	Total	Th	Ses	Pr	Total
MSc(IT)201	.Net Technology	3	2	-	4	100	25	-	125	40	15	-	55
MSc(IT)202	Data Structures	3	2	-	4	100	25	-	125	40	15	-	55
MSc(IT)203	Computer Networks & Data Communication	3	2	-	4	100	25		125	40	15	-	55
MSc(IT)204	Operating System (with Linux as case Study)	3	2	-	4	100	25	-	125	40	15	-	55
MSc(IT)205	AI & Expert System	3	2	-	4	100	25	-	125	40	15	-	55
MSc(IT)206	Programming Lab	-	-	3x 2	3	-	50	100	150	-	30	50	80
MSc(IT)207	Programming Practice	-	-	2	1	-	50	50	100	-	30	25	55
MSc(IT)208	Common Software	-	-	2	1	-	50	50	100	-	30	25	55
MSc(IT)209	Personality Development / Group Discussion	-	-	2	1	-	25	-	25	-	15	-	15
	TOTAL	15	10	12	26	500	300	200	1000	200	180	100	480

03-8-2018

SECOND SEMESTER
.Net Technology
Subject Code - MSc(IT)201

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

Introduction to ASP .NET, Differentiate classic ASP and ASP .NET, Web application, Web forms, Form validations – Client side, Server side, controls in web forms, Events in Web form.

UNIT - V : Advanced concepts and Database Programming

Delegates, ADO .NET Architecture, .NET dtat 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

1. MSDN online – by Microsoft
2. Visual Basic .NET Complete - By BPB Publications, New Delhi.
3. The Complete Reference VB .NET – By Jeffery R. Shapiro, Tata Mcgraw Hill.
4. Professional VB .NET 2003 – by bill Evjen & others, Wiley Dreamtech India (P) Ltd. New Delhi.

03-08-2018

SECOND SEMESTER
Data Structures
Subject Code - MSc(IT)202

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, Preliminaries, String Processing and Arrays -
Introduction, Basic terminology, Elementary data organization, Data structure and its operation. Algorithms : complexity, time-space Tradeoff. Mathematical Notation and functions, Algorithmic Notation. Basic Terminology of Strings, String operations, Word Processing, Pattern Matching Algorithms. Linear Array, Representations of Array in Memory, Traversing, Insertion and Deletion in Linear Array, Multidimensional Array. Pointers: Pointer Array, Records: Record Structures, Representation of Records in Memory; Parallel Arrays, Matrices, Sparse Matrices.

UNIT - II : Linked Lists –
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, Circular Linked List.

UNIT - III : Stacks, Queues, Recursion -
Stacks, Array Representation of Stack, Arithmetic Expressions; Polish Notation, Quick sort, an application of Stacks, Recursion, Tower of Hanoi, Implementation of Recursive Procedures by Stacks, Queues, Dequeues, Priority Queues, Circular 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; Huffman's Algorithms, General Tree. Graph Theory Terminology, Sequential Representation of Graph; Adjacency Matrix, Path Matrix, Linked Representation of Graph.

UNIT - V : Sorting And Searching –
Sorting: Bubble Sort, Insertion Sort, Selection Sort, Merging, Merge Sort, Radix Sort.
Searching : Linear Search, Binary Search, Searching and data modification, hashing.

BOOKS RECOMMENDED :

1. *Data Structure* - **Seymour Lipschutz (Schaum's Series).**
2. *Data Structure & Program Design* - **Robert L. Kruse, 3rd Ed., Prentice Hall.**

03-8-2018

SECOND SEMESTER

Computer Networks & Data Communication

Subject Code - MSc(IT)20

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 Concept of Networking, Data Communication, Required network elements, The role of Standards Organization. Line Configuration, Various Topologies, Transmission Mode, Categories of Networks- LAN, MAN, WAN. The benefits of a Computer Networks.

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

Shannon's and Nyquist theorems for maximum data rate of a channel. Transmission media- Co-axial, UTP, Fiber optic and wireless. Analog and digital data Transmission- parallel and serial transmission. DTE-DCE interface using RS-232C. Study of modems- 56k and Cable Modem. Modem standards.

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

Line Discipline, Flow Control- stop and wait, sliding window, Go back N, Error Control- ARQ stop and wait, sliding window ARQ. HDLC, SLIP, PPP. Multiple access protocols- ALOHA, Slotted ALOHA, CSMA/CD. IEEE standards for LAN's and MAN's. The IP protocol, and its header. IP address classes and subnet mask. The concept of ICMP, ARP, RARP, RSVP, CIDR and Ipv6.

Routing algorithms- shorted path first, Distance Vector, Link State. Congestion Control-The leaky bucket and Token bucket 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. Network Performance Issues. The Concept of Domain Name System, Various Resource Records. Architecture and services of E-mail (RFC-822 and MIME). The Concept of World Wide Web- server side and client side.

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.

03-8-2018

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 :

1. Principles of Operating System - Peterson.
2. Operating System - Mandinick & Donovan.

SECOND SEMESTER
AI & Expert System
Subject Code - MSc(IT)205

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 Programmiing 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.

BOOKS RECOMMENDED

Computer Networks– A S Tanenbaum

Data Communication and Networking- Forouzan

SECOND SEMESTER
Operating System (with Linux as case Study)
Subject Code - MSc(IT)204

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:

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 view point, 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

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:

1. Elaine Rich and Kevin knight: Artificial Intelligence-Tata McGraw hill.
2. Dan W. Patterson: Introduction to Artificial Intelligence and Expert Systems. Prentice hall of India.
3. Nills j. Nilson: Principles of Artificial Intelligence; Narosa publishing house.
4. Clocksin & C.S. Melish ; Programming in PROLOG – Narosa publishing house.
5. M.Sasikumar, S.Ramani. etc: Rule based expert system (A practical Introduction) Narosa publishing house.

03-8-2018

SCHEME OF TEACHING AND EXAMINATIONS
MASTER OF SCIENCE IN INFORMATION TECHNOLOGY

THIRD SEMESTER

Subject Code	SUBJECTS	Teaching Load Per Week			Credit	Examination Marks							
						Max. Marks				Min. Marks			
		L	T	P	L+(T+P)/2	Th	Ses	Pr	Total	Th	Ses	Pr	Total
Msc(IT)301	AI & Expert System	3	2	-	4	100	25	-	125	40	15	-	55
Msc(IT)302	Introduction to .Net Technology	3	2	-	4	100	25	-	125	40	15	-	55
Msc(IT)303	Software Engineering	3	2	-	4	100	25	-	125	40	15	-	55
Msc(IT)304	Electives : 1. Data Mining & Warehousing 2. Advanced Computer Architecture	3	2	-	4	100	25	-	125	40	15	-	55
Msc(IT)305	Electives : 1. Mobile Communication 2. Artificial Neural Network & fuzzy logic	3	2	-	4	100	25	-	125	40	15	-	55
Msc(IT)306	Programming Lab	-	-	3x2	3	-	50	100	150	-	30	50	80
Msc(IT)307	Programming Practice / Mini-Project	-	-	2	1	-	50	50	100	-	30	25	55
Msc(IT)308	Common Software/Mini-Project	-	-	2	1	-	50	50	100	-	30	25	55
Msc(IT)309	Seminar	-	-	2	1	-	25	-	25	-	15	-	15
	TOTAL	15	10	12	26	500	300	200	**1000**	200	180	100	**480**

03-08-2018

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 Programmiing 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:

1. Elaine Rich and Kevin knight: Artificial Intelligence-Tata McGraw hill.
2. Dan W. Patterson: Introduction to Artificial Intelligence and Expert Systems. Prentice hall of India.
3. Nills j. Nilson: Principles of Artificial Intelligence; Narosa publishing house.
4. Clocksin & C.S. Melish ; Programming in PROLOG – Narosa publishing house.
5. M.sasikumar ,S.Ramani. etc: Rule based expert system (A practical Introduction) narosa publishing house.

03-8-2018

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

Introduction and Architecture of ASP .NET, Differentiate classic ASP and ASP .NET, Web application, Web forms, Form validations – Client side, Server side, controls in web forms, Events in Web form.

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

03-08-2018

THIRD SEMESTER : M.Sc.(IT) – 303
Software Engineering

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

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 curve3; alglorithmic cost model (COCOM0, Putnam-slim, Watson and feliix); Other approaches to software cost and size estimation (software complexity, Delphi, costing by analolgy)

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:

1. Software Engineering: A Practitioner's Approach – by essman Roger, Tata McGraw Hill New delhi, 1991.
2. An Integrated approach to Software Engineering - by Jalote Pankaj, Narosa: New delhi.1991.

03-08-2018

THIRD SEMESTER : M.Sc.(IT) – 304
Elective -1 : Data Mining& DataWarehousing

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

03-8-2018

THIRD SEMESTER : M.Sc.(IT) – 304

Elective - 2 : Advanced Computer Architecture

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:

Introdution - 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:

Exploring parallelism in program- multidimensional arrays. Parallel Algorithm-Matrix addition, subtraction, multiplication –block and SIMD. Bitonic sort, sorting on linear array processors. Bernstein's condition, iso efficiency concept.

TEXT BOOKS:.

1. Computer Architecture & Parallel Processing by Kai Hwang and F.A. Briggs-Mc Graw Hill.
2. Advanced Computer Architecture By Kai Hwang –Mc Graw Hill.
3. Parallel Computer Architecture & Programming by- V Raja Raman and C. Shiarammuty-PHI

REFERENCE BOOKS:

Parallel Computing Theory and practice by Michael J. Quinn –Tata Mc-Graw Hill

THIRD SEMESTER : M.Sc.(IT) – 305
Mobile 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.

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

Introduction to Mobile Adhoc Network(MANET), Characteristics of MANET, Applications of MANET, Routing, Need for Routing, Routing Classification, Table-Driven Routing Protocol – Destination Sequenced Distance Vector Routing Protocol, Cluster-Head Gateway Switch Routing, Wireless Routing Protocol. Source initiated On-demand Routing- Adhoc On Demand Distance Vector Routing, Dynamic Source Routing, Temporarily Ordered Routing Algorithms, Hybrib Protocol – Zone Routing Protocol.

RECOMENDED 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

03-08-2018

SCHEME OF TEACHING AND EXAMINATIONS
MASTER OF SCIENCE IN INFORMATION TECHNOLOGY

FOURTH SEMESTER

Subject Code	SUBJECTS	Teaching Load Per Week			Credit L+ (T+P)/2	Examination Marks							
						Max. Marks				Min. Marks			
		L	T	P		Sessional Marks of Project Work	Project Viva-Voce	Pr	Total	Sessional Marks of Project Work	Project Viva-Voce	Pr	Total
Msc(IT)401	System Development Project (System Design & Implementation)	5	-	30	20	200	200	-	400	120	100	-	220
	TOTAL	5	-	30	20	200	200	-	400	120	100	-	220

Note : Major Project will include Research Project as well during which candidate may publish Research Paper.

03-04-2016