University of Rajasthan
Jaipur

SYLLABUS

M.Sc. (IT)

(Semester Scheme)

I & II Semester Examination 2020-21

III & IV Semester Examination 2021-22

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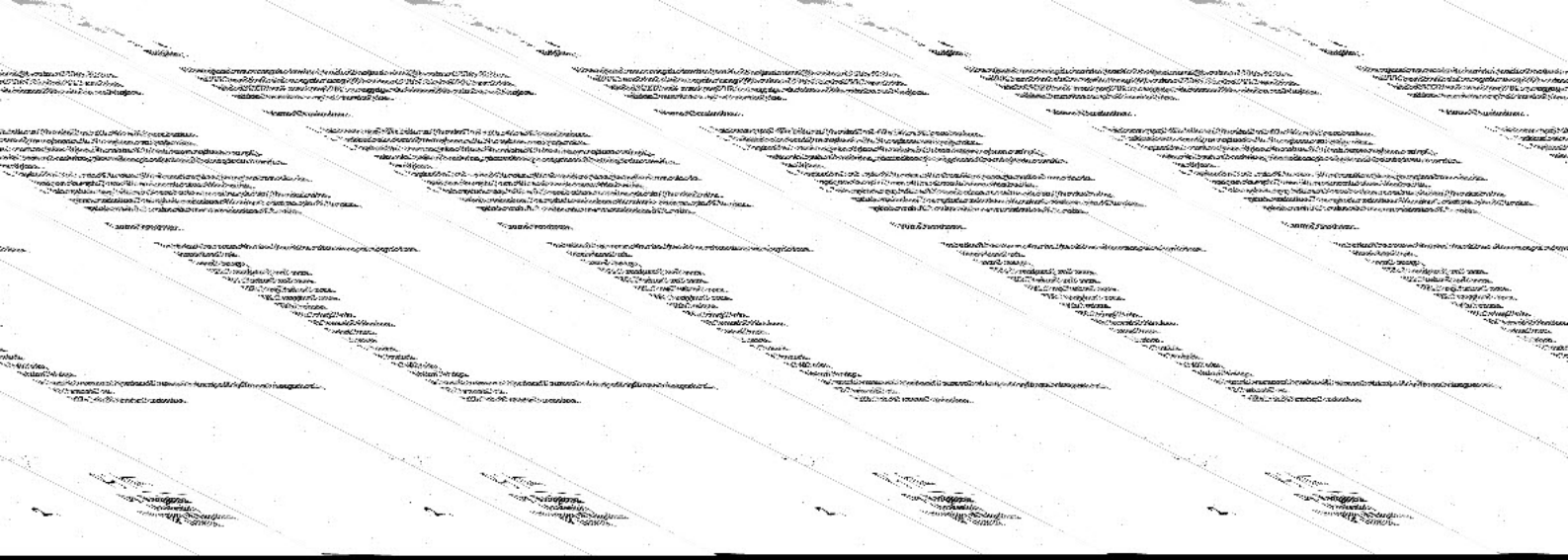

M.Sc.(IT) Syllabus as per new scheme : credit based semester system (Four Semesters in two years) with continuous assessment (30% with non-inclusion in cumulative Grade point average(CGPA)).

To obtain a Master's Degree M.Sc.(IT), a candidate is required to earn 120 credits with grade E or higher. For this each semester will offer 36 credits. To earn credits for a paper, a candidate shall be required to obtain grade E or higher (or equivalent marks percentage) in the theory/practical examination. A candidate has to pass in the continuous assessment (internal) as well as in that paper separately. However, the grade point/marks obtained in the continuous assessment will not be included in Semester Grade Point Average(SGPA). In continuous assessment and End of Semester Examination (EoSE) separate grades will be awarded. The candidate will not be permitted to appear in EoSE of a particular credit (i) if he/she does not meet out 75% attendance requirement, or (ii) he/she fails to secure a Semester Grade Point Average (SGPA) of 1.5 in the continuous assessment.

The Credit Courses have been classified as

a. Compulsory Core Courses (CCC)
b. Elective Core Courses(ECC)

A course is identified by a course code designated by a string of six alphanumeric characters and a course title. In a course code the first three characters of the string indicate the degree/course name in short and the later three alphanumeric characters designate a particular curse. In the case of compulsory core course the fourth character identifies the semester numeric digit and in case of the elective core courses the fourth character indicates the cluster of specialization. For compulsory or elective theory core courses the fifth is '0', for laboratory core course it is '1' and fo. project/seminar course it is 2 and. the sixth digit indicates number of the course in that category.

M.Sc.(IT)-First Semester

S. No.	Subject Code	Subject Title	Course category	Credit	Contact Hours per Week			EoSE * Duration(Hr	
					L	T	P	Thy	P
1	MIT 701	Programming with C	CCC	4	3	1	0	3	0
2	MIT 702	Operating Systems	CCC	4	3	1	0	3	0
3	MIT 703	Database Management Systems	CCC	4	3	1	0	3	0
4	MIT 704	Fundamentals of Information Technology	ECC	4	3	1	0	3	0
5	MIT 705	Data Communication and Computer Networks	ECC	4	3	1	0	3	0
6	MIT 706	Web Site Development	ECC	4	3	1	0	3	0
7	MIT 711	Programming in C Lab	CCC	4	0	0	6	0	4
8	MIT 712	DBMS Lab	CCC	4	0	0	6	0	4
9	MIT 713	Web Authoring Tools Lab	ECC	4	0	0	6	0	4

*End of Semester Examination

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M.Sc.(IT)-Second Semester .

S. No.	Subject Code	Subject Title	Course category	Credit	Contact Hours per Week			EoSE * Duration(Hrs)	
					L	T	P	Thy	P
1	MIT 801	Object Oriented Technology Using C++	CCC	4	3	1	0	3	0
2	MIT 802	Data Structures and Algorithms	CCC	4	3	1	0	3	0
3	MIT 803	Software engineering	CCC	4	3	1	0	3	0
4	MIT 804	Computer Graphics and Multimedia Technology	ECC	4	3	1	0	3	0
5	MIT 805	System Analysis and Design	ECC	4	3	1	0	3	0
6	MIT 806	Application Development Using .NET framework(ASP)	ECC	4	3	1	0	3	0
7	MIT 811	Programming in C++ Lab	CCC	4	0	0	6	0	4
8	MIT 812	Data Structure With C++ Lab	CCC	4	0	0	6	0	4
9	MIT 813	.NET (ASP) Lab	ECC	4	0	0	6	0	4

*End of Semester Examination

M.Sc.(IT)-Third Semester

S. No.	Subject Code	Subject Title	Course category	Credit	Contact Hours per Week			EoSE * Duration(Hrs)	
					L	T	P	Thy	P
1	MIT 901	Programming in Java	CCC	4	3	1	0	3	0
2	MIT 902	Data Warehousing & Data Mining	CCC	4	3	1	0	3	0
3	MIT 903	E-Commerce Technologies	CCC	4	3	1	0	3	0
4	MIT 904	Principles of Management	ECC	4	3	1	0	3	0
5		Elective-11 (Any One in Elective Group – 1)	ECC	4	3	1	0	3	0
6		Elective-21 (Any One in Elective Group 2)	ECC	4	3	1	0	3	0
7	MIT 911	Programming in Java Lab	CCC	4	0	0	6	0	4
8	MIT 922	Mini Project	CCC	4	0	0	6	0	4
9		Elective 31 (Any One in Elective Group 3)	ECC	4	0	0	6	0	4

*End of Semester Examination

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M.Sc.(IT)-Forth Semester

S. No.	Subject Code	Subject Title	Course category	Credit	Contact Hours per Week			EoSE * Duration(Hrs)	
					L	T	P	Thy	P
1	MIT 921	Major Project : Minimum Four Months in an Organization approved by the Director/Head of the Centre/Department	CCC (PRJ)	36	0	0	42	0	4

*End of Semester Examination

Elective Core Courses:

Elective Course Code	Course Category	Subject Title	Prerequisite	Semester
Elective-1 (Any one)				
MIT A01	ECC	Artificial Intelligence		III
MIT A02	ECC	Information Security and Cryptography		III
Elective-2 (Any one)				
MIT B01	ECC	Advanced Java Programming		III
MIT B02	ECC	Wireless Technology		III
Elective-3 (Any one)				
MIT C01	ECC	Advance Java Programming Lab	MIT B01	III
MIT C02	ECC	Wireless Technology Lab	MIT B02	III

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Course Contents in Detail – M.Sc.(IT) I Semester-

Note:

1. Papers MIT 701, MIT 702, MIT 703, MIT 711 and MIT 712 are compulsory(CCC) and Papers MIT 704, MIT 705, MIT 706 and MIT 713 are elective(ECC).
2. Continuous assessment(Internal) will be done by the concerned teacher on the basis of test papers, regularity in the class and performance of the student. Maximum marks in continuous assessment of each paper is 100.

MIT 701:Programming with C

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit-I

Problem solving with computers, Flow charts, Basic concepts of programming languages, programming domains.
C Character set, variables and constants, keywords, Type checking, Scope and lifetime data types. Operators, Instructions, assignment statements, arithmetic expression, comment statements, simple input and output, Boolean expressions.

Unit-II

Control structures, decision control structure, loop control structure, case control structure. String and character handling, arrays and string processing, data validation examples .
Functions, function prototype, subroutines, scope and lifetime of identifiers parameter passing mechanism, recursion.

Unit-III

User defined data types, enumerated data types, unions, structures, array of structures,

Unions of structures. Storage class specifies, Pre processors header files and standard lib, Functions.
Pointer : Definition and uses of pointers, arithmetic , pointers and arrays, pointers and function, pointer to pointer, pointer to structures. Dynamic memory allocation.

Unit-IV

Console Input and Output functions, data files, operations on data files, text and binary files, formatted data files

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Implementation of simple data structures : Stacks, Queues, Linked Lists, trees, searching and sorting algorithms.
Interaction with hardware, system calls, command line arguments, operations on bits, Bit-fields. Graphics in C

Recommended reference books:

1. Gottfried B; Programming with C: Schaum Qutlines; Mc Graw Hill Edition.
2. Balagurusamy E; Programming in ANSI C;Fifth Edn; Mc Graw Hill,2011.
3. Kanetkar Y.; LET US C; X Edition, BPB,2010
4. Deitel HM & Deitel JP; C How to program; 5th Edn; Pearson Pub.
5. Gottfried B.; Programming with C: Schaum Outlines; Tata Mc Graw Hill Edition
6. Balagurusamy E.; Programming in ANSI C ;Fifth Edn; Mc Graw Hill,2011.
7. Kanetkar Y.; LET US C; X Edition; BPB,2010.
8. Deitel HM & Deitel JP; C How to Program; 5 Edn; Pearson Pub.

MIT 702: Operating Systems

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit—I

Necessity of an Operating system, Operating system structure, Evolution of Operating Systems (multiprogramming systems, batch systems, timesharing system, distributed systenl and Real-time system). Operating system structure, Operating system components and services.

DOS : Booting sequence, system files and commands, files and directories, overview of MS DOS commands, FDISK and Disk organization. Windows: Graphical User interfaces, Installation of Windows OS, Scan Disk, Task Bars, Task Manager, Toolbars, Settings, Control Panel and all features there in, files and Folder management, Windows Explorer, Installing and running Programs, Connecting computers, Sharing Resources. Compressing disks and partitions.

Unit—II

Process Management: Process concept, Process scheduling, Cooperating processes, Threads, Inter-process communication, CPU scheduling criteria, Scheduling algorithms, Multiple- processor scheduling.

Process Synchronization and Deadlocks: The Critical-Section problem, synchronization hardware, Semaphores, Classical problems of synchronization, Critical regions, Monitors, Deadlocks-System model, Characterization, Deadlock prevention, Avoidance and Detection, Recovery from deadlock, Combined approach to deadlock handling.

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Unit—III

Storage Management: Memory Management and Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation with paging, Virtual Memory, Demand paging and its performance, Page replacement algorithms, Demand segmentation, File systems, secondary Storage Structure, File concept, access methods, directory implementation, Efficiency and performance, Disk structure, Disk scheduling methods, Disk management, Backup and Recovery, Swap-Space management, Security and Protection.

Unit—IV

Introduction to UNIX: Unix File system, Kernel, Logging in and out, Directory, Redirecting input and output cat command, vi editor, Introduction to shell, sub-shell and their variables, shell scripts, meta-characters, sort, head, tail, split, cut, paste, find, tr, dd commands, grep and sed, UUCP, Unix and Networking, Accessing the Internet, Unix system administration.

Recommended books:

1. Galvin P .B., Silberschatz ; Operating System Principles; (Seventh Edition);J. Wiley,2008.
2. Willium Stalling; Operating Systems : Internal & Design Principles; Sixth Edn; Pearson., 2009.
3. Gary Nutt: Operating Systems-A Modem Perspective (Second Edition), Pearson Education, 2008.
4. Tanenbaum A.S., Modem Operating Systems, 2 Edn., PHI Publ,2003.
5. Forouzan B; Unix and Shell Programming; 9 Reprint; Cengage, 2009.
6. Sumitabha Das; Unix Concepts & Applications; 4 edition; TMH, 2008.
7. D.M. Dbamdhere: Systems Programming and Operating Systems (Second Edition), Tata Mc-Graw Hill Publishing Company Limited.
8. Harvey M. Deitel, Operating Systems, Pearson Education.
9. Jerry Joyce, Marianne Moon; MS Windows ; PHI

MIT 703: Database Management Systems

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit—I

Data and information Basic concepts, Problems of Early Information Systems, Advantages of a DBMS. Database Architecture, Three levels of the architecture- external, conceptual and internal level. Centralized and Distributed databases.

ER Model , entities, mapping constraints, E R diagram, reduction E R diagrams to tables, aggregation, design of an E-R database schema.

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Database Models: Hierarchical Model -Concepts of a Hierarchy, IMS Hierarchy. Relational model - Concepts of relational model, relational algebra, relational calculus. Network model -Concepts of a Network, DBTG Network, DBA Schema declaration. Introduction to Object Oriented Database.

Unit-II

Database query languages -Basic retrieval capability retrieval and explosion, update commands, QBEI, client! server design. Standard Query Language- Basic SQL Query, Nested Queries Aggregate Operators, Null Values, Embedded SQL, Cursor, Dynamic SQL. Query optimization - Query evaluation plans, pipelined evaluation, Iteration interface for operators and access methods, Relational Query Optimizer. Relational Data Integrity- Candidate keys, Candidate keys, Supper key and alternate keys. Foreign keys, foreign key rules, nulls.

Unit—III

Data Management Issues: backup, recovery, maintenance, and performance. Database design -.Schema Refinement, Functional Dependencies, Normalization, Decompositions. Tuning –Tuning indexes, Tuning queries and views, tuning the conceptual schema, DBMS benchmarking, Security - Access control, Discretionary and Mandatory Access control, Encryption and implementation. Enterprise wide data application, building client/server databases.

Unit — IV

Object oriented databases : Concepts, Standards, Languages, Design, Internet databases, Open database connectivity (ODBC). Transaction processing - Transactions atomicity, Durability, Serializability and Isolation. Concurrency Control techniques — Two phase locking, timestamp ordering, granularity locking techniques. Database recovery techniques based on deferred & immediate updates and shadow paging.

Databases and Tools: MS-Access SQL Visual Basic ORACLE wherever required these tools should be used.

Reference Books:

1. Korth H F and Silberschataz A, Database System Concepts, Sixth Edition; McGraw HiJJ,2006.
2. Navathe S.B., Elmasri R.; Fundamentals of Database Systems, Fifth Edition; Pearson. 2009.
3. Leon; and Leon, SQL. Tata McGraw Hill Pub. Co. Ltd.
4. Ivan Bayross; SQL, SQLIPL 4 Edn; BPB, 2009
5. Ramakrishan and Gharke, Database Management Systems, 3t61 Edition; Tata Mc Graw Hill, 2003.
6. Date C J, Database Management Systems, Pearson Education Asia.
7. Singh S.K.; Database Systems; I Edition; Pearson, 2006.

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MIT 704: Fundamentals of Information Technology

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit- I

Defining IT, Information systems, Data and Information, Elements of Electronic data processing system, Transaction processing, Modes of transactions. iT Applications : IT in Business and industry, IT in home and play, IT in education and training IT in entertainment and the Arts, IT in Science, Engineering, and ethical issues in IT.

Computer software and its types, Programming languages - Machine, assembly and high level, Language translators. Overview of the Digital Computer System - Processor, Memory, Input and Output Devices, Storage Devices, Operating Systems, Application Software, Types of Computers.

Unit-II

Representation of Data: Digital versus Analog, Digital number system (binary, octal, decimal and hexadecimal numbers,), Conversion from one form to another, fractional numbers and signed numbers, Complements, Arithmetic operations on binary numbers, Fixed point and floating point representations.

Boolean algebra (addition, subtraction, multiplication and division), Logic Gates (NOT, OR, AND, NAND, NOR, XOR, XNOR), types Codes (ASCII, EBCDIC, Unicode), encoding and decoding.

Unit-III

Computer Components (Briefly overview) : Mother Board (Special reference to Intel Chipset motherboard), CISC Micro Processors (Special reference to Pentium, AMD), RISC processors (Motorola, PowerPC, and 680x0 series,), types of RAM, RAM, Flash, Cache,; SDRAM, DDR), System clock, Buses (Data, Address, Control).

Input devices (keyboard, mouse, trackball, track-pad, pen, touch screen, bar code reader, scanner, OMR, OCR, voice input, video input, digital camera. IP Phone, IPOD). Output devices (Monitors (refresh rate, resolutions, standards-CGA, VGA, SVGA, HO, LCD monitors, Video controllers and VRAM). Printers : Dot-Matrix, Line, Ink-Jet, Laser, thermal wax, Plotters (Pen, Ink-jet, electrostatic), Voice output.

Storage devices : Storage types (Magnetic, Optical, Magneto-optical, Solid state), random versus sequential access, formatting, tracks and sectors, speed, storage capacity, Hard Disk (tracks, cylinders, sectors); Hard Drive Interfaces (IDE, EIDE, Fast SCSI, Fast/wide SCSI, Ultra SCSI; Hard Disk Cartridges, RAID). Optical Disks : pits and lands, CD (ROM,R,R/W), DVD (ROM,R,RAM), Magnetic tapes(reels, streamers, DAT,DLT, stripe, Smart card), Modem (Fax/Data/Voice).

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Unit- IV

Internet Applications: Internet, Internet Applications, e-Mail, IRC, Web Surfing, Web Browsers,, Search Engines, Internet Service Providers, Downloading, Audio and Video Conferencing.

Security issues in Internet — Bugs, Viruses, Anti-viruses, Firewalls etc. Internet threats to the society, Cyber laws and Legal issues.

Suggested Reference Books:

1. M. Morris Mano: Computer System Architecture, 3 Hall of India,2008.
2. John D. Carpinell: Computer Systems Organization & Architecture, 3 edition;Pearson Education Asia., 2008.
3. Peter Norton's Introduction to Computers, Third Edition, McGraw Hill
4. Sinha PK; Computer Fundamentals;BPB, 2002.
5. Malvino B.; Digital Computer Electronics; III Edn;TM}I.
6. Albert Paul Malvino, Electronic Principles, McGraw Hill
7. P.Pal Chaudhuri, Computer Organization and Design, Prentice Hall of India.

MIT 705: Data Communication and Computer Networks

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit I

Data transmission: Basic Concepts. Data Communication Systems, DTE Interface, Modems, Transmission Media(Guided & Unguided). Multiplexing : FDM, WDM, TDM, Digital Subscriber Line (Operation, Layers, Traffic control), FTTC, Error detection and correction; Information about microwave : Electromagnetic spectrum, PM Microwave Radio Repeaters. Satellite: Artificial Satellite, Geosynchronous Satellites, Orbital classification, Spacing and Frequency allocation, Multiple accessing.

Optical fiber communication: Basic concept of light propagation, Fiber Cables, Light sources, Optical Detectors, Fiber cable losses, wave division multiplexing, fiber distributed data interface, the fiber channel.

Unit-II

Modulation Principles of Modulation, AM and FM Modulator Circuits, Pulse Code. Modulation, signaling and decoding. Digital Band-pass Modulation. Demodulation detection, signals and Noise,

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Detection of Binary Signal in Gaussian Noise, Demodulation of shaped Pulses, Digital Band Pass Demodulation.

Internet model, OSI seven layer reference model, Functions of OSI layers, LAN technologies - protocols and standards, LAN hardware, TCP/IP (Protocols, architecture), Compare TCP/IP to the Open Systems Interconnection (OS1) reference model, Examine a number of TCP/IP application such as FTP, Telnet, DNS, DIICP etc. Examine addressing nd sub-netting, super-netting, and details of TCP massaging and signaling.

Unit-III

Internet : Internet Architecture, Internet pro and datagram, Routing protocols, UDP, Internet standard services, Networking Technologies, ISDN(Services, Channels, Layers, Broadband ISDN), Cable Modem System, SMDS, Frame relay, fast Ethernet, 100VG-anyLAN and Gigabit Ethernet, FDDI and CDDI, Asynchronous Transfer, SONET(architecture, layers, frame, applications), DWDM Switching and Virtual LAN, Non-ATM Virtual LANs, IEEE 802.10. VLAN standard, X.25 protocols, ATM (architecture, layers, classes, services).

Unit—IV

Networking and Internet Working Devices : Hubs, Switches, Repeaters, Bridges, Routers,

Gateways and roles of these devices in communication.

Network Performance, Analytical approaches, simulation, traffic monitoring. Network Management, Introduction to SNMP, RMON and RMNv2, TMN, Directory services and network management. Issues related to network reliability and security, SSL and VPN, firewalls and Kerberos.

Suggested Reference Books:

1.Behrouz A Foruzan, Data Communication and Networking; 3161 Edition; Tata McGraw Hill., 2004.
2. Behrouz A Foruzan, TCP/IP Protocol Suite; 2 Edition; Tata McGraw Hill., 2003.
3. Stalling William ;Data and Computer Communication; 8 Edition Pearson, 2009.
4. Tannenbaum ; Computer Networks;4 edition; PHI, 2008.
5. Wayne Tomasim Electronic Communications Systems, Pearson, Education Asia.
6. M.A. Miller, Data arid Network Conununications, Thomosn Learning.
7. Gilbert Held, Understanding Data Communication, Techmedia.
8. Fred Harshal, Data Communications Communications Networks, Pearson Education Asia.

MIT 706: Web Site Development

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper 3 hours; Max. Marks 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

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Unit—I

World Wide Web: Elements of the Web, Web browser, viewing Pages with browsers, using a browser for mail, News and chat, Security and Privacy issues (cookies, firewalls, executable Applets and Scripts, blocking systems), Netscape navigator and features therein, Internet Explorer and Features there in, Active X controls, Dealing With web pages that contains ActiveX, Java and Java Scripts, Blogs and Twitters, Using search engines Subscription and channels.

Unit—II

Creating and Maintaining Web Sites: Planning, Navigation and Themes, Site types and Architecture, Elements of a Web page(Pages & Layout, Text, Color, Images, GUI Forms & GUI Features), steps of creating a site, Web site Planning, Web Site Designing Process, publishing and publicizing site/structuring web site. Creating web page by using web editors (Netscape composer, FrontPage express), creating web graphics, using GIF, JPEG, getting web clip art. The Web Medium, Web Searching, Adding Search facility, Optimizing for Search Engines, Site Maps and other Navigation Aids, Site Delivery and Management.

Unit —III

Introduction of HTML and XHTML : introduction, markup language, editing HTML & XHTML common tags, headers, text styles, linking, images, formatting text, horizontal rules and more line breaks, unordered lists, nested and ordered lists, basic HTML/XHTML tables : intermediate tables and formatting, forms, more complex forms, internal linking, creating and using image maps.

Unit — IV

Dynamic HTML : CSS : introduction - inline styles, creating style sheets with the style element, conflicting styles, linking external style sheets, positioning elements, backgrounds, element dimensions, text flow and the box model, user style sheets. Dynamic HTML: object model and collections: introduction, object referencing, collections all and children, dynamic style, dynamic positioning, using the frames collection, navigator object.

Introduction to scripting languages, role of scripting languages in web applications. Introduction to: Java script and PHP.

Recommended Books

1. M.L. Young: Complete Reference b: Internet; 2 Edition; Tata Mc Craw Hill, 2006.

2. Thomas A. Powel; Web Design: C.R.; Second Edition; TMH, 2009.

3. Thomas A. Powel ; HTML & XHTML : C.R.; Fourth Edition; TMH, 2008.

4. Harely Hahn: The Internet, Tata Mc Graw Hill.

5. 0. Robertson: Hands on HTML, BPB Publications.

6. D.A. Tauber, B. Kienan: Microsoft From Page ; BPB Publications.

7. Joel Skiar: Principles of Web Design, BPB Publications.

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Practical Examination

Each practical paper shall be of 4 hours duration on one day and carry 100 marks for the practical examination. The practical examination will involve 3 exercises, each of 20 marks, practical record of 15 marks and viva-voce examination of 25 marks.

MIT 711: Programming in C Lab

Examination: Practical

Exercises to be framed so as to cover the topics and tools covered in theory paper MIT 701.

MIT 712: Data Base Management System Lab

Practical Lab:

Examination: Practical Examination —4 Hours Max. Marks — 100

Exercises to be framed so as to cover the topics and tools covered in theory paper MIT 703.

MIT 713 Web Site Design Lab

Practical Lab:

Examination: Practical Examination

Exercises to be framed so as to cover the topics and tools covered in theory paper MIT 706. Word processing, Spread sheet program, data processing, Presentation Program, Web Surfing and other Internet services.

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Course Contents in Detail – M.Sc.(IT) II Semester-

Note:

1. Papers MIT 801, MIT 802, MIT 803, MIT 811 and MIT 812 are compulsory(CCC) and Papers MIT 804, MIT 805, MIT 806 and MIT 813 are elective(ECC).
2. Continuous assessment(Internal) will be done by the concerned teacher on the basis of test papers, regularity in the class and performance of the student. Maximum marks in continuous assessment of each paper is 100.

MIT 801: OBJECT ORIENTED TECHNOLOGY USING C++

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit—I

Need of Object Oriented Programming, Advantages of OOP, Comparison of Functional Programming and OOP Approach, Essentials of OOP (Objects, classes, Encapsulation, Data abstraction, Inheritance, Reusability, Polymorphism, Delegation, Message Communication).

C++ Basics : Preprocessors, Comments, Data types, Operators, Expressions, Loops and Decisions, Arrays and String handling, Modular Programming with Functions, Structure and Unions.

Unit-II

Pointers and Run time binding, Dynamic memory allocation, Storage class specifiers. Classes, Member functions, Objects, Arrays of objects, Pointers and Classes, Nested classes, Constructors, Destructors, Inline member functions, Friend Functions, Static member function. Inheritance, Single Inheritance, types of base classes, types of derivations, multiple inheritance, container classes, member access control.

Unit-III

Functions Overloading, Operator Overloading, polymorphism, early binding, polymorphism with pointers, Unary and Binary Operator Overloading, Overload Assignment Operator, Copy Constructor, Data Conversion between Objects of different classes, C++ Free Store. Virtual Function Virtual function, late binding, pure virtual functions, Abstract classes, Generic Programming with Templates, Friend functions, Overloaded Function Templates, Multiple Arguments function Template.

Unit—IV

Stream Computation with Console, Stream Computation with Files, opening and closing of files, stream state member functions, binary file operations, structures and file operations, classes and file operations, random access file processing, File operations using pointers. Exception handling : Exception handling mechanism, Throwing mechanism, Catching mechanism.

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Pointers : Addresses and pointers, pointer & arrays, pointer & functions, use of pointers in strings, linked lists & memory management, and pointers to objects.

Recommended Books

1. Herbert Schildt; C++: The Complete Reference; 4 Edn; TMH, 2003.
2. Robert Lafore; Object Oriented Programming in C++; 4 Edition; Techmedia
3. Balagurusainy E.; Object Oriented Programming C++; 4 Edition; TMH, 2009.
4. Venugopal, Rajkumar; Mastering C++; Tata Mcgrow Hill, 2006.
5. Kanetkar Y.; LET US C++; BPB; 2009.
6. Deitel and Deitel: How to Program C++, addison Wesley, Pearson Education Asia
7. John R. Hubbard, Programming with C++, McGraw Hill International.

MIT 802: Data Structures and Algorithms

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit-I

Algorithms, pseudo code, efficiency of algorithms, analyzing algorithms and problems, complexity measures, basic time analysis of an algorithm, space complexity. Data abstraction and basic data structures, data types and abstract data types.

Basic data structure – Arrays, Stack, Queues and their applications, linked and sequential representation of arrays, stacks & queue.

Unit-II

Linked lists, representation of linked list in memory. insertion, deletion and searching of linked list, two way lists. Arithmetic expressions, Polish notations, dequeue and priority queues.

Trees: Basic concepts, linked representation, representation in continuous memory. Binary and N-ary trees, Searching, insertion and deletion in binary search tree, traversing algorithms using stacks, header nodes threads.

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Unit-III

Graphs and their representations, sequential representation- Adjacent matrix, linked representation of graphs, operations on graph, traversing a graph. DFS and BFS algorithms. Heap structures, heap sort algorithm .

Unit-IV

Sorting and Searching: Use various data structures for searching and sorting, Internal and external sorting techniques, linear and binary search, Hash tables & Hashed searching, Bubble sort, Insertion sort, Selection sort, Merge sort, Radix sort, quick sort.

Recommended reference books

1. S. Lipschutz: Data Structures; Mc Graw Hill International Edition,2008.
2. A.V. Aho, J.E. Hopcroft, and J.D. Ullman, Data Structures and Algorithms, 3rd Edition; Pearson Education Asia,2008
3. Salaria R.S.: Data Structure and Algorithms Using C/C++; 4th Edition; Khanna.
4. Jean-Paul Tremblay and Paul G. Sorenson, An Introduction to Data structures with applications TMH Publishing Co.Ltd.
5. A. Michael Berman: Data Structures via C++ Oxford University Press.
6. Jean-Paul Tremblay and Paul G. Sorenson, An Introduction to Data Structures with application, TMH Publishing Co. Ltd.

MIT 803: Software Engineering

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit—I

Introduction to Software Engineering Software development and life cycle; Software engineering, knowledge engineering and end-user development approaches.

System Analysis : Abstraction, partitioning and projection; Software Requirements and Specifications methods and tools. Flow based, data based and object based analysis.

Unit—II

Software Project Management : Management spectrum, Project size and its categories; Planning a software project; Work breakdown structures; Integrating software design and project planning; Software project teams; Project monitoring and control, Project scheduling, Risk management.

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Unit—III

Software Quality and Testing : Software quality assurance, Types of software testing. Debugging and Reliability-Concept of Software errors, faults, repair and availability. Program complexity analysis; Software quality and matrices.

Software cost and time estimation : Functions points, Issues in software cost estimation (Introduction to the Rayleigh curve), Algorithm cost models (COCOMO, Putnam-Slim, Watson and Felix), Other approaches to software cost and size estimation (S/W complexity, Delphi).

Unit—IV

Software Design : Various design concepts and notations; Process-oriented design (Gane & Sarson and Vourdon notations), Data-oriented design (Warnier-Orr,ER-modelling), Object-oriented design (Booch approach), Verification and validation methods; Documentation and Development procedures; Design matrices. Role of CASE tools in software design.

Emerging Technology : Security engineering Security risk management, Design for security, System survivability; Service-oriented software engineering; Aspect-oriented software engineering.

Reference Books:

1. Pressman Roger: Software Engineering - A Practitioners Approach; 6 Edition;Tata McGraw Hill, N, Delhi, 2005.
2. Jalote Pankaj: An Integrated Approach to Software Egineering; 3 Edn; Narosa, New Delhi, 2009.
3. Sommervilie Lan; Software Engineering; 8 Edition; PearsonEducation; 2007.
4. Girdhari Singh; Shalini Pun; Software Engineering; First Edition; Genius Pub.; 2010.
5. Fairley, R.E. : Software Engineering Concepts, McGraw-Hill.
6. Shooman, M.: Software Engineering, McGraw-Hill.
7. Shere,: Software Engineering & Management, Prentice-Hall.

MIT 804: Computer Graphics and Multimedia Technology

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit- I

Graphic Application and Hardware: Need of Graphics, Applications. Display and Input devices. Raster Scan system, Random Scan system, Graphic software.

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Out put Primitives: Line drawing algorithms — DDA algorithm, Bresenham's algorithm; Circle Drawing Midpoint Algorithm, Ellipse Generating Midpoint Algorithm; Scan line polygon fill algorithm, Inside Outside tests, Boundary fill algorithm, Flood fill algorithm. Colour tables, Gray Scale levels, Fill attributes.

Unit-II

Geometric Transformations : Matrix representation and Homogeneous coordinates; Composite transformations, 2D and 3DTransforniations Translation, Scaling, Rotation, Reflection and Shear. transformations and its characteristics.

2D Viewing : The Viewing pipeline, Windows to View Port coordinate transformation. Clipping operation — Point, Line, Polygon, surface clippings. Sutherland-Cohen Line Clipping Algorithm, Cyrus Beck Algorithm.

Unit- III

3D Concepts, 3D Display methods, Parallel Projections, Perspective projections, Visible surface identification. Hidden Surface Removal - Back Face Detection, Depth Buffer, Depth Sorting, Scan Line and A Buffer Techniques.

Curves and Surface: Hermit Curves, Bezier Curves, B-Spline Curves. Properties and Continuity concepts.

Unit- IV

Image Processing: Capture and Storage of digital images; file formats, basic digital techniques like convolutions the holding and histogram manipulations, image enhancements, geometric manipulation and their applications the automatic identification and extraction of objects of interest.

Multimedia: Introduction: Hardware, Software Application. Non Temporal. Media: Text, Hypertext, images Cameras, Scanner, frames Grabbers, formats.

Audio: Digital Audio, Music, MIDI wave files. Video : Analog Video operations, Compression, Digital Video MPEG, JPEG. Graphics Animation: Tweaking, Morphing Motion Specification, Simulating Acceleration.

References Books:

1. Hearn D., Baker P.O Computer Graphics; 2 edition;Pearson, 2003.
2. Foley .I.D.; Van D.A.; Fundamentals of interactive Computer Graphics; 2' Edition; Addision Wiley, 2000.
3. Ronger D.F.; Elements of Computer Graphics;
4. Giloi W K; Interactive Computer Graphics; PHI
5. Mewman W, Sproul R.F.; Principles of Interactive Computer Graphics; Mc Graw Hill.
6. Mukherjee DP; Fundamentals of Computer Graphics and Multimedia; PHI,2002.
7. RalfSteinmetz & narhtedt; Multimedia; .Pearson;2007

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MIT 805: System Analysis and Design

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit-I

System Concepts and the information systems Environment: The System concept Definition, System Central Objectives, Elements of a system, Environment, Boundaries and interfaces. Types of systems- Physical or Abstract systems, Open or Closed systems, Role, Need and Responsibility of System Analyst, Introduction to system Development approaches- Data Oriented and Object Oriented.
System Development Life Cycle : Linear or Waterfall Cycle, Linear cycle, phases of SW Development Life Cycle.
System planning and Analysis : Strategies for determining information requirement, Problem definition & Project initiation, Background analysis, Data and Fact Gathering Techniques, Feasibility Studies-Technical, Operational, economic, cost benefit analysis, Interface design tools, user interface evaluations.

Unit-II

System Design: Process modeling, Physical and logical design. Conceptual Data modeling, Entity Relationship analysis, ER modeling, Context diagram. Tools of structured analysis (DFD, Data dictionary, Decision Tree, Decision tables, Structured English). Structure Charts, Modules, Parameter passing. Execution sequence, Structured Design, Conversion from Data Flow Diagrams to Structure Charts.
Input/Output Forms Design : Requirement of forms design, User Interface Design, Input design, CRT Screen forms design, Output design.
Files organization and Database Design : Designing to Fields, Physical records, Physical files, Database design, Data Structures, Normalization, Introduction to CASE Tools, Features, advantages, and limitations of CASE tools.
System Implementation, Maintenance and documentation, testing, evaluation, maintenance Activities, Documentation, Document configuration, maintaining a configuration.

Unit-III

Introduction to MIS : Meaning and Role of MIS, Definition of MIS, System Approach to MIS, MIS Organization within a company. Concept of Balanced MIS, effectiveness and efficiency criteria.
MIS Planning : MIS structure and components, MIS features, problem and Derivation of MIS Plans, Prioration and development strategies.

Conceptual Design of MIS : Definition of problem, system objectives and system constraints, Analysis of information source, alternative system design and selection optimal system.
Detailed System Design and Implementation; Application of basic design concepts of MIS, Involvement of end-user and role of MIS department and System Analyst, Role of Top Management during design and implementation.

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Unit-IV

System Evaluation : System evaluation review and update, Management and control of MIS function, Advanced MIS concept, Pitfalls in MIS development.

Decision Support System:- DSS Definition, Characteristics, Application Case Study. Expert System : Concept Structure, Application and Case Study.
Applications of MIS : Applications of MIS to E-Business, Applications in Manufacturing sector, Service sector, DSS, Decision Support System, Enterprise Management Systems.

Recommended Books

1. Awad E.M.; System Analysis and Design; Second Edition; Galgotia Publication.
2. Igor Hawryzkiewyez, Introduction to System Analysis and Design, 4th edition. Prentice-Hall
3. Jain Mdhulika, Jain Satish; Strucutred system Analysis and Design;2nd Edition, 2007.
4. Jeffrey L. Whittren, and Lonnie D. Bentey, Systems analysis and Design Methods 4th edition, Tata McGraw-Hill.
5. Philip L Weaver, Practical SSADM wer 4+A Complete Tutorial Guider, Pitman Publishing.
6. Don Yeates, Maura Shields and David Helmy. System Analysis and Design Longman group limited.
7. Robert Mudrick; Management Information System; PHI.
8. W.S. Jawadkar; Management Information System;McGraw-Hill.

MIT 8O6: Application Development Using .NET Framework (ASP)

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit-I

Introduction to .Net framework: Managed Code and the CLR, Intermediate Language, Metadata and JIT Compilation, Automatic Memory Management

Language Concepts and the CLR: Visual Studies .Net, Using the .Net Framework

The Framework Class Library: .Net objects- ASP .NET, .NET web services, Windows Forms.

Elements : Variable and constants, data types, declaration. Operators, types, precedence, Expressions. Program flow, Decision statements, if...then..else, select..case, Loop statements, while... and while, do...loop, for...next, for...each...next.

Types. Value data types, Structures, Enumerations, Reference data types, Single dimensional, Multi dimensional arrays, jagged arrays and dynamic arrays.

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Unit-II

Windows Programming: Creating windows forms, windows controls, Button, Check box, Combo box, Label, List box, Radio Button, Text box, Events, Click, close deactivate, Load, mousemove, mousedown, mouseup.

Menus and Dialog Boxes : Creating menus, menu items, context menu, Using dialog boxes, show dialog() method.

ADO.NET : Architecture of ADO.NET, ADO.NET providers, Connection, Command, Data Adapter, Dataset, Connecting to Data Source, Accessing Data with Data set and Data reader, Create an ADO.NET application, Using Stored Procedures.

Unit-III

ASP.NET Features: Application of States and Structure; Change the Home Directory in IIS- Add a Virtual Directory in IIS- Set a Default Document for IIS – Change Log File Properties for IIS-Stop, Start, or Pause a Web Site.

Creating Web Controls: Web Controls, HTML Controls, Using Internist Control, Using Input Validation Controls, Selecting Controls for Applications, Data Controls and Adding web controls to a page.

Creating Web Forms: Server Controls, Types of Server Controls, Adding ASP.NET Code to a page.

Unit-IV

Overview of XML : XML Serialization in the .NET Framework-SOAP Fundamental-Using SOAP with the .NET Framework.

Web Services and WCF : Web Services protocol and standards – WSDL Documents-Overview of UDDI – Calling a Web Service from a Browser-Calling a Web Service by Using a proxy – Creating a simple web service – Creating and Calling a Web Service by Using Visual Studio.NET Architecture of WCF, WCF Client

Reference Books:

1. Mathew Mac Donald: Beginning ASP.NET 4.0 in C# 2010, 3rd Edition, A Pres.
2. Bill Evjen Scott Hanselman, Devin Rader: Professional ASP.NET4, 2010, Willey.
3. George Shepherd: Microsoft ASP.NET Step by step, 2010 Microsoft Press.
4. Imar Spaanjaars: Beginning ASP.NET 4: in C# and VB (Wrox Programming to Programmer), 2010 Wiely Publishing.
5. Steven Holzner; ASP.NET 4.0 (Cover C# & VB) Black Book; Dreamtech Press.
6. Steven Holzner: .NET Programming Black Book; Dreamtech Press.

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Practical Examination

Each practical paper shall be of 4 hours duration on one day and carry 100 marks for the practical examination. The practical examination will involve 3 exercises, each of 20 marks, practical record of 15 marks and viva-voce examination of 25 marks.

MIT 811: Programming in C++ Lab

Practical Lab

Examination: Practical Examination

Exercises to be framed so as to cover the topics and tools covered in theory paper MIT 801.

MIT 812: Data Structure with C++ Lab

Practical Lab

Examination : Practical Examination

Exercises to be framed so as to cover the topics and tools covered in theory paper MIT 802.

MIT 813: .NET (ASP) Lab

Practical Lab

Examination: Practical Examination — Exercises to be framed so as to cover the topics and tools covered in theory paper MIT 806.

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Course Contents in Detail – M.Sc.(IT) III Semester-

Note:

1. Papers MIT 901, MIT 902, MIT 903, MIT 911 and MIT 922 are compulsory(CCC) and Papers MIT 904, MIT 905, Elective-I, Elective-II and Elective-III are elective(ECC).
2. Continuous assessment(Internal) will be done by the concerned teacher on the basis of test papers, regularity in the class and performance of the student. Maximum marks in continuous assessment of each paper is 100.

MIT 901 : Programming in Java

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit—I

Introduction to OOP: Paradigms of Programming Languages - Basic concepts of Object Oriented Programming , Objects and Classes, Data abstraction and Encapsulation, Inheritance, Polymorphism, Dynamic binding, Message communication; Benefits of OOP; Application of OOPs.

Introduction to Java : History, Java features, Java Environment- JDK, APL Types of Java program, Creating and Executing a Java program; Java Tokens: Keywords, Character set, Identifiers, Literals, Separator; Java Virtual Machine (JVM); Command Line Arguments; Comments in Java program.

Elements: Constants, Variables, Data types, Scope of variables, Type casting. Operators- Arithmetic, Logical, Bit wise operator, Increment and Decrement, Relational, Assignment, Conditional, Special operator; Expressions, Evaluation of expressions.

Unit-II

Decision making and Branching: If statement and its types,; switch statement; Decision making and Looping-While loop, do — While, for loop, break, labeled loop, continue Statement.

Arrays: One Dimensional Array, Multidimensional Array, Vectors, Wrapper classes; String Array, String Methods, String Buffer Class.

Class and objects :Defining a class, Methods, Creating objects, Accessing class members, Constructors, Method overloading, Static members: Nesting of Methods, this keyword, command line input

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Inheritance: Defining a subclass, deriving a sub class, Single Inheritance, Multilevel Inheritance, Hierarchical Inheritance, Overriding methods, Final variables and methods, Final classes, Finalizer methods, Abstract methods and classes, Visibility Control- Public access, Private access, friend, protected. Interfaces- Multiple Inheritance, Defining interface, Extending interface, Implementing Interface, Accessing interface variables.

Unit — III

Packages: Java API Packages — System Packages, Naming Conventions, Creating & Accessing a Packages Finding Packages and CLASSPATH, Adding Class to a Packages, Hiding Classes.

JAVA Streams: Data Flow with Java Streams, Input Streams, Output Streams.

Exception Handling: Limitations of Error handling, Advantages of Exception Handling, Types of Errors, Basics of Exception Handling, try blocks, throwing an exception, catching an exception, finally statement. declaring and throwing custom Exceptions.

Multithreading: Creating Threads, Life of a Thread, Defining & Running Thread, Thread Methods, Thread Priority, Synchronization, Implementing run-able interface, Thread Scheduling.

Unit—IV

Collections : The Collection Framework, The Collection Classes, implementation of List, Set and Map Interface, Accessing a Collection via an Iterator, Object Ordering, The SortedSet and SortedMap Interface, Comparators.

GUI in Java : Aplet and its uses; Abstract window tool kit, Event Handlers , Event Listeners. AWT Controls and Event I landling — Labels, TextComponent, ActionEvent, Buttons, CheckBoxes, ItemEvent, Choice, Scroilbars, Layout Managers, Input Events, Menus; Introduction to Swing

Reference/Text Books:

1. Patrick Naughton, Herbert Schildt:, Java. The Complete Reference 7 Edition Osborne/McGraw-Hill 2006.

2. E. Balagurusamy :Programming with Java - Tata McGrawhill Publishers, II Edition.

3. Khalid A. Mughal, RolfW. Rasmussen; A programmer's Guide to Java Cettification(2t Edn).

4. Cay S Horstmann, Gary Cornell; Core Java Vol I & II; The Sun Micro systems Press.

5. Ken Arnold , James Gosling:Core Java Fundamentals (Volume 1 and Volume 2). 2nd Edition-, Addison Wesley

6. Kathy Sierra , Head First Java, 2nd Edition, Oriely

7. Bruce Eckel: Thinking in Java, 4th Edition.

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MIT 902 : Data Warehousing & Data Mining

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit-I

Introduction to Data Warehousing :Introduction, Data Warehouse, importance and functions, Multidimensional Data Model, Data Marting and it's usage, Cost of data marting, Metadata, Data Warehouse Architecture, Building a Data warehouse Implementation, Further Development. Planning and Project Management of Data Warehouse.

Unit -II

Data Mining : Data Warehousing to Data Mining, Evolution Analysis, Classification of Data Mining Systems, Architecture of data mining system, Major Issues in Data Mining. Data Preprocessing Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation. Data Reduction, Discretization and Concept Hierarchy Generation; Analysis of Attributes Relevance, Discriminating between Different Classes. Data Warehouse and OLAP Technology for Data Mining.

Unit -III

Association Rules : Association Rule Mining, Single-Dimensional Boolean Association Rules from Transactional Databases, Multi-Level Association Rules from Transaction Databases. Issues regarding classification & prediction, Different Classification Methods, Prediction.

Unit -IV

Clustering and Applications of Data Mining Cluster Analysis, Types of Data, Categorization of Major Clustering Methods. Partitioning Methods, Hierarchical Methods, Density-Based Methods. Model-Based Clustering Methods, Clustering High Dimensional Data. Data Mining Applications.

Future Trends :Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Web Mining, Spatial Data Mining, Temporal Mining, Applications and Trends in Data Mining.

Text/Reference Books:

1. Data Warehousing in the Real World-SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.
2. Data Mining- Concepts and Techniques - JIAWEI HAN & MICHELINE KAMBER Harcourt india.
3. Data Warehousing; Reema Thareja; Oxford
4. Data Mining introductory and advanced topics —MARGARET H DUNHAM, PEARSON EDUCATION.
5. Data Warehousing in Real World - Anahory, Pearse Education.
6. Data Mining Techniques ARUN K PUJARI, University Press.
7. Building the Data Warehouse W H Inmon 3rd Edition Wiley, 2003.
8. Data Warehousing Fundamentals PAULRAJ PONNIAH WILEY STUDENT EDITION.

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MIT 903 : E-Commerce Technologies

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit-I

Basic Concepts : Introduction, Definition, Objectives, Advantages and disadvantages, Forces driving E-Commerce, Traditional commerce Vs E-Commerce, E-Commerce opportunities for industries, Growth of E-Commerce.

Electronic Data Interchange : Concepts of EDI and Limitation, Application of EDI, Disadvantages of EDT, EDI model; EDI Implementation, MIME and Value-Added Network, Internet-based EDT.

Unit-II

E-Commerce Models: B2C,B2B, C2C, C2B, other models — Brokerage Model, Aggregator Model, Info-mediatory Model, Community Model and value chain Model, Advertise Model.

Electronic Payment Systems: Special features required in payment systems, Types of E-payment systems, E-Cash, E-cheque, credit card, Smart Card, Electronic Purses, e-Billing.

Unit-III

E-Transition Challenges in Indian Corporate, E-Commerce and WWW, e- Marketing, E-Customer Relationship Management, E-CRM Problems and Solutions, CRM Capabilities and Customer life cycle, E-Supply Chain Management. E-Strategy Planning the E-Commerce Project, E-Business Strategy and Data Warehousing & . Mining. Customer-effective Web Design — Requirement, Strategy and Model.

Unit- IV

M-Commerce: Overview of mobile-Commerce, Mobile Delivery Technology & Switching Methods, m-Commerce Security issues, Mobile ATM(ICICI Bank Case Study). Applications of M-Commerce: Mobile Financial Applications, m-wallet, Mobile Shopping. Case-Study of an e-commerce application.

Security Issues in E-Commerce: Security risk of E-Commerce, Types of threats, Security tools and risk management approach. Cyber laws, Business Ethics, IT Acts.

Suggested Books:

(1) Bharat Bhaskar, Electronic Commerce - Framework Technologies and Applications, Tata McGraw Hill.
(2) Ravi Kalakota & A.B. Whinston, Frontiers of Electronic Commerce, Pearson Education.
(3) Ravi Kalakota & A.B. Whinston, Electronic Commerce — A Manager's Guide, Pearson Education.
(4) Agarwala Kamlesh, N and Agarwala Deeksha, Business on the Net Introduction to the E-Com., Macmillan India
(5) P. T. Joseph, E-Commerce: A Managerial Perspective, PHI, 2002.

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MIT 904 : Principles of Management

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit—I

Management : Meaning and Nature, Management Process, Functions and Skill, Management and Administration, Managerial Roles and Responsibilities. Historical Development of Management, Environmental Influences, Business ethics and Business morale.

Principles of management : Meaning. Definition, Principles. Development of Management Thought; Objective of Management. Management by Objective, management by Exception. Modern Techniques of Management.

Unit -II

Coordination : Nature, Importance, Types and Techniques of Coordination.
Planning: Approaches to Planning, Techniques of Planning, Planning Process, Types of plans, Types and Formulation of Strategy, Advantages and Limitations of Planning.
Decision making: Classification of Decision, Process of Decision Making, Techniques of Decision Making, Creativity in Decision Making.

Unit-III

Organizing: Concept and Process of Organization, Organizational Structure, Delegation of Authority, Centralization and Decentralization of Authority, Formal and Informal Organizations. Commitment towards Organization and Society.

Communication: Principles and Techniques of Communication. Process, Importance, Channels and Barriers of Communication.

Unit—IV

Motivation : Principles of Directing, Theories of Motivation, Financial and Non financial Incentives, Motivation and Performance.

Leadership : Theories, Traits of Leaders, Styles, Quality of Leadership, Transformational of Leaders. Leadership and Management.

Control: Process of Control, Principles of Control, Techniques of Control, Limitations of Control. Process of Management Change and its effects.

Reference/ Text Books

1. Prasad M L ; Principles and Practice of Management, Sultan Chand & Sons.
2. Nolakha R L ; Principles and Practice of Management; Ramesh Book Depot.
3. Chandan J S; Principles of Management.
4. Serlaker & Kalaker; Principles of Management

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MIT A01: Artificial Intelligence

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit-I

Foundations of AI :, scope, problems, and approaches of AT. Intelligent agents, reactive, deliberative, goal-driven, utility-driven, and learning agents ,Artificial Intelligence programming techniques

Problem-solving through Search: forward and backward, state-space, blind, heuristic, problem-reduction, A, A*, AO*, minimax, constraint propagation, neural, stochastic, and evolutionary search algorithms, sample applications.

Unit-II

Knowledge Representation and Reasoning: ontologies, foundations of knowledge representation and reasoning, representing and reasoning about objects, relations, events, actions, time, and space; predicate logic, situation calculus, description logics, reasoning with defaults, reasoning about knowledge, sample applications.

Planning: planning as search, partial order planning, construction and use of planning graphs

Unit-III

Representing and Reasoning with Uncertain Knowledge: probability, connection to logic, independence, Bayes rule, bayesian networks, probabilistic inference, sample applications.

Decision-Making: basics of utility theory, decision theory, sequential decision problems, elementary game theory, sample applications. Expert System- Need, Components, Categories, Stages of Expert System Development.

Unit -IV

Machine Learning and Knowledge Acquisition: learning from memorization, examples, explanation, and exploration, learning nearest neighbor, naive Bayes, and decision tree classifiers, Q-learning for learning action policies, applications.

Brief Survey of selected additional topics: perception, communication, interaction, and action; multi-agent systems. Sample Applications of AI, student project presentations

Reference Text Books:

1. Artificial Intelligence: A Modern Approach, 3rd Edition by Stuart Russell and Peter Norvig. , ISBN-13: 978-0-13-604259-4.
2. Artificial Intelligence, Rich & Knight, TMH
3. Introduction to AI & Expert Systems, Patterson, PHI
4. Neural Networks, Fuzzy Logic & Genetic Algorithms, Rajsekharan, PHI

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MIT A02 : Information Security And Cryptography

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit- I

Introduction to Concept of Security : Need, Principles, Type of attacks, Security services & mechanisms. Definition & Goal of Cryptography, Encryption and decryption. Classical Encryption techniques — Symmetric Cipher Model, Substitution ciphers, Transposition ciphers, Stenography.

Modern techniques: Simplified DES, Block cipher principles, DES Standards, DES Strength, Differential & Linear Cryptanalysis, Block Cipher Design Principles, Block Cipher Modes of Operation.

Unit -II

Mathematical Foundation - Pseudorandom Number Generation and Stream Cipher, Prime number, Random Number Generation, Fermat's & Euler's theorem, The Chinese Remainder Theorem. Advanced Encryption Standard. Algorithms: Principles of Public-Key Cryptosystem, RSA Algorithm, Diffie-Heliman Key-Exchange algorithm.

Unit -III

Data Integrity Algorithms: Authentication Requirements, Authentication Functions, Hash Function, Security of hash function & Secure hash algorithm(SHA). Message Authentication Codes, MACS, MD5 Message Digest algorithm. Digital Signature, Authentication Protocol, Digital Signature Standard(DSS), proof of digital signature algorithm.

Unit -IV

Web Security: Key Distribution techniques, Authentication Services, Electronic mail Security- Pretty Good Privacy(PGP), S/MIME, Domain Keys Identified mail. Secure socket layer & Transport layer security, Secure electronic transaction (SET). Authentication: User Authentication, Password Based Authentication, Certificate based authentication, Bio-metric authentication, Authentication Model, Kerberos and Public Key Cryptography, Application of Kerberos, X.509 Authentication Service. System Security: Intruders, Malicious Software, firewall, Trusted Systems.

Reference/Text Books:

1. William Stallings; Cryptography and Network Security; Fifth Edition; Pearson Education.
2. Atul Kahate; Cryptography and Network Security; Tata McGrawHill.
3. Pachghare VK; Cryptography and Information Security; PHI Learning.
4. Bishop Matt Satyanarayana, introduction to Computer Security, Pearson.

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MIT B01: Advanced Java Programming

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit -I

Introduction to Advance Java Application: Networking with Java - Networking basics, Socket, port, Proxy servers, Internet addressing and URL, java.net --networking classes and interfaces, Implementing TCP/IP based Server and Client. Classes to be covered Socket, Server Socket, IP Address, URL connections;

Java Applets: Introduction, Applet Architecture, The java.applet Class, The Five Stages of an Applets Life Cycle, Methods for Adding UI Components, Methods for Drawing and Event Handling.

Unit —II

Applications in distributed environment : Remote method Invocation — activation models — RMI custom sockets — Object Serialization RMI — hOP implementation — CORBA — IDI, technology — Naming Services — CORBA programming Models JAR file creation.

Database Application : The JDBC Connectivity Model, Database Programming, Connecting to the Database Types of JDBC Drivers, Writing JDBC applications using select, insert, delete, update; Types of Statement objects (Statement, Prepared Statement and Callable Statement); ResuitSet, ResuitsetMetaData; Inserting and updating records, Connection Pooling.

Unit- III

Introduction to J2EE : J2EE Overview, Nee of J2EE, J2EE Architecture, J2EE APIs J2EE Containers.

Servlet :Web Application Basics, Architecture and challenges of Web Application , Introduction to Servlet, Servlet life cycle, Developing and Deploying Servlets ,Exploring Deployment Descriptor (web.xml) ,Handling Request and Response , Initializing a Servlet ,Accessing Database , Servlet Chaining , Session Tracking & Management Dealing with cookies, Transferring Request.

Java Server Pages Technology: Basic JSP Architecture, Life Cycle of JSP (Translation, compilation) ,JSP Tags and Expressions , Role of JSP in MVC-2 ,JSP with Database ,JSP Implicit Objects ,Tag Libraries ,JSP Expression Language (EL), Using Custom Tag,.

Unit —IV

Java Beans :Introduction to Java Bean ,Rules for writing a Simple Bean, Java Naming Directory Interface API ,Java Naming Directory Interface concept.

Enterprise JAVA Beans : Enterprise Bean overview, Types of enterprise beans, Advantages of enterprise beans, The Life Cycles of Enterprise Beans, Working with Session Beans, Statefull vs. Stateless Session Beans, Working with Entity Beans, Message Driven Beans

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List of Reference/Text Books:

1. Cay S Horstmann and Gary Cornell, "Core Java 2, Volume I - Fundamentals", Pearson Education, USA, 2005.
2. Cay S Horstmann and Gary Cornell, "Core Java 2, Volume II - Advanced Features", Pearson Education, USA, 2005.
3. Nicholas C Zakas, Jeremy McPeak and Joe Fawcett, "Professional Ajax", Wrox, USA, 2006.
4. Steve Holzner, "Inside XML", Techmedia, New Delhi, 2001.
5. Kathy Sierra and Bryan Basham, "Head First Serviets and JSP", Shroff Publishers and Distributors, Mumbai, 2007.
6. Marty Hall and Larry Brown, "Core Serviets and JavaServer Pages: volume 1: core technologies", Pearson Education, USA, 2008.
7. Marty Hall, "Core Serviets and JavaServer Pages: volume 2 Advanced technologies",Pearson Education,USA, 2008.
8. Steve Graham, Doug Davis, Simeon Simeonov, Glen Daniels, et.al, "Building Web Services with Java", Pearson Education, USA, 2004.
9. Enterprise JavaBeans (3rd Edition), O'Reilly' by Richard Monson-Haefel,
10. Developing Java Beans, O'Reilly Media By Robert Englander.

MIT B02: Wireless Technology

Theory & Tutorial: 4 hours per week (4 Credits)
Examination: Theory Paper – 3 hours; Max. Marks – 100

Note:

1. Candidate has to attempt five questions in all. All questions carry equal marks.
2. Question No. 1 covering whole syllabus will consists of 10 short answer questions carrying 2 marks each.
3. Question No. 2 to 5, each of 20 marks, will be framed by taking one question from each unit. There will be an internal choice within the unit.

Unit I

Introduction of wireless communication: Overview, Frequencies for Radio transmission, Evolution of Cellular System, Cellular System Architecture & Operation, Performance criteria. Multiple access schemes for wireless communication- TDMA, FDMA, CDMA, CSMA, SDMA.

Unit II

Wireless Network Planning And Operation: Frequencies Management, Channel assignments, Frequency reuse, System Capacity & its improvement, Handoffs & its types, roaming, Co-Channel & Adjacent Channel Interference

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Digital Cellular Networks: GSM Architecture & Interfaces, Signal Processing in GSM, Frame Structure of GSM, Channels used in GSM.

Unit III

Wireless LAN Technology: Overview, WLAN Technologies, Infrared LANs, Spread Spectrum LANs Narrowband, Microwave LANs IEEE 802.11- Architecture, Protocols, MAC layer, MAC frame, MAC Management.

Bluetooth : Overview, Architecture of Bluetooth Systems, Radio Specifications, Base Band Specification, Link Manager specification, Logical Link Control & Adaptation Protocol.

Unit IV

Mobile Data Networks: Introduction, Data oriented CDPD Networks, GPRS.
Wireless Access Protocol: WAP Architecture, Wireless Datagram, Wireless Transport Layer Security, Wireless Transaction, Wireless Session, Wireless Application Environment, WML.

Text/ Reference Books:

1. Mobile communication Engg- Lee W.C.Y
2. Wireless Communication, Principles & Practice-T.S.Rappaport
3. Mobile Communication, Pearson Education- Schiller
4. Wireless Communication & Networking-William Stalling
5. Mobile communication –Rampantly
6. Wireless digital communication", PHI, 1999- KamiloFeher
7. Principles of Wireless Networks-Kaveshpahlavan & P.Krishna Murthy

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