

**UNIVERSITY OF RAJASTHAN,**  
**JAIPUR**

**M.A./M.SC./M.COM**

*(Information Technology)*

**2013-2014 (PREVIOUS)-I/II SEMESTER**

**2014-2015 (FINAL)- III/IV SEMESTER**  
*(awarded)*

*Prepared by .*

*21/9*  
*16/9*

*Checked by*

*24/9*

2. Eligibility:

All the graduate from recognized University situated in Rajasthan having 50% marks or CGPA of 3.0 in the UGC. Seven Point scale for general category (45% marks or CGPA 2.5 in the UGC Seven point Scale for SC/ST/ Non-creamy layer OBC) in aggregate and min. 60% marks for Non- Rajasthan candidate. Reservation as per University Rules.

3. Scheme of Examination:

- (1) Each theory paper EoSE shall carry 100 marks The EoSE will be of 3 hours duration. Part 'A' of theory paper shall contain 10 Short Answer Questions of 20 marks, based on knowledge, understanding and applications of the topics/texts covered in the syllabus. Each question will carry two marks for correct answer.
- (2) Part "B" of paper will consist of Four questions with internal choice (except in cases where a different scheme is specifically specified in the syllabus) of 20 mark each. The limit of answer will be five pages.
- (3) Each Laboratory EoSE will be of four/six hour durations and involve laboratory experiments/exercises, and viva-voce examination with weightage in ratio of 75:25.

4. Course Structure:

The details of the courses with code, title and the credits assign are as given below.

Abbreviations Used

Course Category

CCC: Compulsory Core Course

ECC: Elective Core Course

OEC: Open Elective Course

SC: Supportive Course

SSC: Self Study Core Course

SEM: Seminar

PRJ: Project Work

RP: Research Publication

Contact Hours

L: Lecture

T: Tutorial

P: Practical or Other

S: Self Study

Relative Weights

IA: Internal Assessment (Attendance/Classroom Participation/Quiz/Home Assignment etc.)

ST: Sessional Test

EoSE: End of Semester Examination

Part-B of the paper shall contain four questions. One question will be set from each unit. Each question will have three parts. Candidates are required to attempt all four units by taking only two parts from each question of the unit. Each question carry 20 marks.

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**First Semester**

S. No.	Subject Code	Subject Title	Course Category	Credit	Contact Hours per Week			EoSE Duration (Hrs.)	
					L	T	P	Thy	P
1	MIT 101	Fundamentals of Information Technology	CCC	4	3	1	-	3	-
2	MIT 102	Data Structures and Programming with C	CCC	4	3	1	-	3	-
3	MIT 103	Data Communication and Computer Networks	CCC	4	3	1	-	3	-
4	MIT 104	Operating Systems	CCC	4	3	1	-	3	-
5	MIT 105	Data Base Management Systems	CCC	4	3	1	-	3	-
6	MIT 106	Office Automation and Management	CCC	4	3	1	-	3	-
7	MIT 111	Programming in C & DS Lab	CCC	4	-	-	6	-	4
8	MIT 112	DBMS Lab	CCC	4	-	-	6	-	4
9	MIT 113	Office Management Lab	CCC	4	-	-	6	-	4

**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 201	Computer graphics and Multimedia Technology	CCC	4	3	1	-	3	-
2	MIT 202	Web Site Development	CCC	4	3	1	-	3	-
3	MIT 203	Management Information System	CCC	4	3	1	-	3	-
4	MIT 204	Object Oriented Technology Using C++	CCC	4	3	1	-	3	-
5	MIT 205	Software Engineering	CCC	4	3	1	-	3	-

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6	MIT 206	Programming in VB	CCC	4	3	1	-	3	-
7	MIT 211	Event Driven Programming (VB) Lab	CCC	4	-	-	6	-	4
8	MIT 212	Programming in C++ Lab	CCC	4	-	-	6	-	4
9	MIT 213	Web Authoring Tools Lab	CCC	4	-	-	6	-	4

**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 301	Principles of Management	CCC	4	3	1	-	3	-
2	MIT 302	Programming in Java	CCC	4	3	1	-	3	-
3	MIT 303	Data Warehousing & Data Mining	CCC	4	3	1	-	3	-
4	MIT 304	E-Commerce Technologies	CCC	4	3	1	-	3	-
5		Core Elective - 1	ECC	4	3	1	-	3	-
6		Core Elective - 2	ECC	4	3	1	-	3	-
7	MIT 311	Programming in Java Lab	CCC	4	-	-	6	-	4
8		Core Elective - 3	ECC	4	-	-	6	-	4
9	MIT 323	Mini Project	CCC	4	-	-	6	-	4

**Fourth Semester**

S.No.	Subject Code	Subject Title	Course Category	Credit	Contact Hours per Week			EoSE Duration (Hrs.)	
					L	T	P	Thy	P
1	MIT 421	Major Project : Minimum Four Months in an Organization approved by the Director/Head of the Centre/Department	PRJ	36	-	-	54	-	4

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## ELECTIVE CORE COURSES

Elective Course Code	Specialization	Paper Title	Prerequisite	Semester
MIT A01	ECC	Artificial Intelligence		III
MIT A02	ECC	Information Security and Cryptography		III
MIT B01	ECC	Advanced Java Programming		III
MIT B02	ECC	Application Development Using .NET Framework		III
MIT C01	ECC	Advanced Java Programming	MScIT B01	III
MIT C02	ECC	Application Development Using .NET Framework	MScIT B02	III

**Note:**

1. Tutorial activities include problem solving, quizzes, tests, projects, seminar or lecture by guest speakers.
2. Not more than two elective papers be started keeping in view of the feasibility.
3. There are six compulsory papers in M.S.(IT) I & II Semesters and four compulsory papers in M.Sc.(IT) III Semester. There is Two elective papers in M.Sc.(IT) III Semester. The one elective paper may be chosen from each group of two elective papers. The minimum 15 students be required to choose a elective.
4. The examination in each practical paper shall be conducted by a Board of two examiners (one Internal Examiner appointed by the Director/Head/Principal and another External Examiner appointed by the University). If the external examiner does not come in time or refuse to come on the day of examination, then the Director/Head/Principal will take name of an eligible external examiner in consultation with Convener, COC in CS & IT. The Director/Head/Principal will coordinate and control for smooth conduct of the examination of all practical papers/project work/practical training/Seminar etc. The Director/Head/Principal will under the facsimile of his/her signature forward the same to the University.
5. Internal assessment will be done on the basis of Test(s), Quiz, Home Assignment, regularity in the class and performance of the candidate. Maximum marks in Internal Assessment of each paper is 30. Minimum passing marks in Internal Assessment of each paper is 10.
6. The students have to qualify in internal assessment but the marks obtained in the internal assessment will not be counted for determining the credits.

**MIT 101: Fundamentals of Information Technology****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.

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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 680xO 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, HD, 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).

### 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<sup>rd</sup> edition;Prentice Hall of India,2008.
2. John D. Carpinell: Computer Systems Organization & Architecture, 3<sup>rd</sup> edition;Pearson Education Asia., 2008.
3. Peter Norton's Introduction to Computers, Third Edition, McGraw Hill
4. Sinha PK; Computer Fundamentals;BPB, 2002.

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5. Malvino B.; Digital Computer Electronics; III Edn;TMH.
6. Albert Paul Malvino, Electronic Principles, McGraw Hill
7. P.Pal Chaudhuri, Computer Organization and Design, Prentice Hall of India.

## MIT 102: Data Structures and Programming with C

### Unit- I

Algorithm: Basic concepts and notation, Understanding the Problem, Plan the Logic, Code the Program, Pseudo code and Flowchart, efficiency of algorithms, complexity measures, basic time analysis of an algorithm, space complexity.

Abstract data types: Data abstraction and basic data structures, data types, abstract data types. Conditionals: Control structures & Looping structures. Recursion: Concepts, Characteristics of Recursive functions.

### Unit- II

C Language : Data types, Operators, Expressions, Data Input and Output, Assignment Statements, Conditional Structures, Looping structures, Arrays and String handling, Functions, Parameter passing, Library function and Directives, structures, Union, user-defined type types, Pointers, Pointers & arrays, Pointers & functions and file handling : File organization, Text and Binary files, Opening and closing files.

### Unit- III

Stacks and Queue structures, types of queues, Arrays: Storage allocation functions, hashed allocation techniques.

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.

String manipulations : representations of strings in contiguous storage, string conversions, representations of variable-length strings. Dynamic memory allocation.

### Unit – IV

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

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

Sorting and Searching: Use various data structures for searching and sorting, Internal and

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external sorting techniques, Binary search, Hash tables & Hashed searching, Bubble sort, Insertion sort, Selection sort, Merge sort, Radix sort, Quick sort.  
Language: C (Examples using C wherever required).

**Suggested 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, 3<sup>rd</sup> Edition; Pearson Education Asia, 2008.
3. Salaria R.S.; Data Structure and Algorithms Using C/C++; 4<sup>th</sup> Edition; Khanna.
4. Patel R.B.; Expert Data Structures with C; 2<sup>nd</sup> Edition; Khanna.
5. R. Johnsonbaugh, Discrete Mathematics, Pearson education Asia
6. Jean-Paul Tremblay and Paul G. Sorenson, An Introduction to Data structures with applications, TMH Publishing Co. Ltd.
7. D.P. Friedman, M. Wand and CT Haynes, Essentials of Programming Languages, Prentice Hall of India, 2008.
8. Gottfried B.; Programming with C : Schaum Outlines; Tata Mc Graw Hill Edition.
9. Balagurusamy E.; Programming in ANSI C ;Fifth Edn; Mc Graw Hill, 2011.
10. Kanetkar Y.; LET US C; X Edition; BPB, 2010.
11. Deitel HM & Deitel JP; C How to Program; 5<sup>th</sup> Edn; Pearson Pub.

**MIT 103: Data Communication and Computer Networks**

**Unit – I**

Data transmission : Basic Concepts. Data Communication Systems, DTE-DCE 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, 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 (OSI) reference model, Examine a

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number of TCP/IP application such as FTP, Telnet, DNS, DHCP etc. Examine addressing and sub-netting, super-netting, and details of TCP messaging and signaling.

### Unit – III

Internet : Internet Architecture, Internet protocol 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 802.1Q VLAN standard, X.25 protocols, ATM (architecture, layers, classes, services).

### Unit – IV

Networking and Internetworking 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 RMONv2, 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; 3<sup>rd</sup> Edition; Tata McGraw Hill., 2004.
2. Behrouz A Foruzan, TCP/IP Protocol Suite; 2<sup>nd</sup> Edition; Tata McGraw Hill., 2003.
3. Stalling William ;Data and Computer Communication; 8<sup>th</sup> Edition; Pearson, 2009.
4. Tannenbaum ; Computer Networks;4<sup>th</sup> edition; PHI, 2008.
5. Wayne Tomasin Electronic Communications Systems, Pearson, Education Asia.
6. M.A. Miller, Data and Network Communications, Thomson Learning.
7. Gilbert Held, Understanding Data Communication, Techmedia.
8. Fred Harshal, Data Communications Communications Networks, Pearson Education Asia.

## MIT 104: Operating Systems

### Unit – I

Necessity of an Operating system, Operating system structure, Evolution of Operating Systems (multiprogramming systems, batch systems, timesharing system, distributed systems 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.

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**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.

**Unit - III**

**Storage management:** Memory Management-Logical 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. William Stallings; Operating Systems : Internal & Design Principles; Sixth Edn; Pearson., 2009.
3. Gary Nutt: Operating Systems-A Modern Perspective (Second Edition), Pearson Education, 2008.
4. Tanenbaum A.S., Modern Operating Systems, 2<sup>nd</sup> Edn., PHI Publ,2003.
5. Forouzan B; Unix and Shell Programming; 9<sup>th</sup> Reprint; Cengage, 2009.
6. Sumitabha Das; Unix Concepts & Applications; 4<sup>th</sup> edition; TMH, 2008.
7. D.M. Dhamdhare: 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

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# MIT 105: Database Management Systems

## 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 constrains, E-R diagram, reduction E-R diagrams to tables, aggregation, design of an E-R database scheme.

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, QBE I, 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 Hill,2006.
2. Navathe S.B., Elmasri R.; Fundamentals of Database Systems, Fifth Edition;

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- Pearson. 2009.
3. Leon, and Leon, SQL, Tata McGraw Hill Pub. Co. Ltd.
  4. Ivan Bayross; SQL, SQL/PL ; 4<sup>th</sup> Edn; BPB, 2009
  5. Ramakrishan and Gharke, Database Management Systems, 3<sup>rd</sup> 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.

## MIT 106: Office Automation and Management

### UNIT- I

The Need and Importance of Office Automation, Role of computer in Office automation and management, Office automation software.

Word Processing Software : Creating and Saving documents, Entering, Editing, Moving, Copying and Formatting Text, Page formatting, Finding and replacing text, Spell checking and Grammar checking, enhancing documents, Indexing, Columns, Tables and feature there in, Inserting (Objects, picture, files etc.), Using Graphics, templates and wizard, using mail merge, using WordArt, customizing, MS Word. Designing pages with MS Publisher, Inserting and Manipulating Objects, Editing Fills and re-coloring pictures.

### UNIT- II

Spreadsheet Software : Spreadsheet terminology, organization of the worksheet area, entering information, editing cells using commands and functions, moving copying, inserting and deleting rows and columns, formatting worksheet, printing worksheet, creating charts, modifying and enhancing charts, using date, time and addressing modes, naming range and using statistical, mathematical and financial functions, database in a worksheet, creating, sorting, querying and maintaining the database, multiple worksheets and Macros, working with objects.

### UNIT- III

Data Base Management Software : Planning a database (tables, queries, forms, reports), Creating and editing database, customizing tables, linking tables, designing and using forms, modifying database structure, maintaining database, Sorting and Indexing database, Querying a database and generating Reports, modifying a Report, exporting a Report to another format.

### UNIT- IV

Presentation Software : Anatomy of a PowerPoint Presentation, Creating and Viewing a presentation, Managing Slide Shows, Navigating through a presentation, Using hyperlinks, advanced navigation with action setting and action buttons, organizing formats with Master Slides, applying and modifying designs, adding graphics, multimedia and special effects, creating presentation for the web.

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Office System user interface, Managing security and privacy in the MS Office System, Sharing documents between Office System Components and different versions of the office System.

**Reference Books :**

1. Microsoft; 2007 Microsoft Office System; PHI
2. Microsoft; Microsoft Office 2003 : Plain & Simple; PHI
3. Microsoft; Microsoft Office XP: Plain & Simple; PHI
4. Sanjay Saxena; A First Course in Computers 2003 Edition; Vikas Pub.
5. Joe Habraken; Microsoft Office 2003; Que; Techmedia.

**MIT 111 : Programming in C and DS Lab**

Examination : Practical

Exercises to be framed so as to cover the topics and tools covered in theory paper MScIT 102.

**MIT 112 : 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 MScIT 105.

**MIT 113: Office Management Lab**

Practical Lab :

Examination : Practical Examination

Exercises to be framed so as to cover the topics and tools covered in theory paper MScIT 106. Word processing, Spread sheet program, data processing, Presentation Program, Web Surfing and other Internet services.

**MIT 201: Computer Graphics and Multimedia Technology**

**Unit- I**

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

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.

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**Unit- II**

Geometric Transformations : Matrix representation and Homogeneous coordinates; Composite transformations, 2D and 3D Transformations - 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:**

1. Hearn D., Baker P.D.; Computer Graphics; 2<sup>nd</sup> edition; Pearson, 2003.
2. Foley J.D.; Van D.A.; Fundamentals of Interactive Computer Graphics; 2<sup>nd</sup> Edition; Addison-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. Ralf Steinmetz & narhtedt; Multimedia; Pearson; 2007.

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## MIT 202: Web Site Development

### 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, Bloge 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, Colour, 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<sup>nd</sup> Edition; Tata Mc Graw 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. G. Robertson: Hands on HTML, BPB Publications.
6. D.A. Tauber, B. Kienan: Microsoft From Page ; BPB Publications.
7. Joel Sklar: Principles of Web Design, BPB Publications.

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# MIT 203: MANAGEMENT INFORMATION SYSTEM

## Unit – I

Introduction to MIS : Meaning and role of MIS, Definition of MIS, Systems approach to MIS, MIS organization within a company. Effectiveness and efficiency criteria.

Overview of system analysis and design, feasibility analysis, design, implementation, testing and evaluation. Introduction to Systems Development Life Cycle and its phases.

## Unit – II

MIS Planning : MIS structure and components, MIS features, Problem and Derivation of MIS plans, Prioritization and developmental strategies.

Conceptual Design of MIS : Definition of the problem, System objectives and system constraints. Analysis of information source. Alternative system design and selection of optimal system. conceptual system design document.

## Unit – III

Detailed System Design and Implementation : Application of basic system design concepts to MIS, Involvement of end-user and role of MIS department and System Analyst, Role of Top Management during design an implementation. System evaluation review and update. Management and control of MIS function.

## Unit – IV

Advanced MIS-System Concept and Controls, , Transaction processing systems, Office automation systems, Decision Support System, Executive information system, AI and Expert systems. Pitfalls in MIS Planning, Designing and Implementation.

MIS in Operation : (see note at end): MIS for Accounting and Finance Function, MIS for Personnel Systems, MIS for Marketing Systems, Production & Inventory system.  
Note: A STANDARD LAYOUT IS TO BE ADOPTED FOR ALL MIS.

### Reference Books :

1. Murdick R.G. Ross J.E. & Claggett J.R. : Information System for Modern Management, 3rd Edn., PHI, 2009.
2. Jawadekar W.S; MIS; Third Edition, TMH,2008.
3. Prasad ML; Prasad Usha; MIS; First edition;Sultan Chand & Sons,2007.
4. Awad Elias M.: System Analysis and Design; 2<sup>nd</sup> edition; Galgotia Pub., 2004.
5. James A.O Brien : Management Information Systems, Galgotia Pubn..
6. Wigarders K., Svensson A., Sehong L.: Structured Analysis & Design of Information Systems,Mcgraw-Hill Book Co..
7. Locus: Anlaysia, Design and Implementation of Information System, 3rd Edn., McGraw-Hill Book Co.
8. Newman: Designing Integrated Systems for the Office Environment, McGraw-Hill Company.

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## MIT 204: OBJECT ORIENTED TECHNOLOGY USING C++

### 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.

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<sup>th</sup> Edn; TMH, 2003.
2. Robert Lafore; Object Oriented Programming in C++; 4<sup>th</sup> Edition; Techmedia
3. Balagurusamy E.; Object Oriented Programming C++; 4<sup>th</sup> Edition; TMH, 2009.
4. Venugopal, Rajkumar; Mastering C++; Tata Mcgrow Hill, 2006.
5. Kanetkar Y.; LET US C++; BPB; 2009.

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6. Deitel and Deitel: How to Program C++, Addison Wesley, Pearson Education Asia
7. John R. Hubbard, Programming with C++, McGraw Hill International.

## MIT 205: Software Engineering

### 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.

### 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 Yourdon 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 Practitioner's Approach; 6<sup>th</sup> Edition; Tata McGraw Hill, N, Delhi, 2005.
2. Jalote Pankaj: An Integrated Approach to Software Engineering; 3<sup>rd</sup> Edn; Narosa, New Delhi, 2009.
3. Sommerville Ian; Software Engineering ; 8<sup>th</sup> Edition; Pearson Education; 2007.
4. Girdhari Singh; Shalini Puri; Software Engineering ; First Edition; Genius Pub.; 2010.
5. Fairley, R.E. : Software Engineering Concepts, McGraw-Hill.
6. Shooman, M.: Software Engineering, McGraw-Hill

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## MIT 206: Programming in VB

### Unit – I

Introduction : Need of Visual languages, Integrated Development Environment (IDE), Advantage of Visual BASIC, Characteristics and features of Visual BASIC -IDE, Projects, User Interface, Objects Oriented, Visual Development and Event-Driven Programming, Forms /Graphic controls, Data processing, sharing with Windows and Internet applications.

### Unit – II

Visual BASIC Programming and Tools: An Introduction of Visual BASIC Programming Simple program construction, Statements, Input/Outputs, Preprocessors, Comments, Editor Codes, Variables, constants and Data types, Arrays Collections Procedures, Arguments, Functions, Subroutines, Control Flow Statements, Loop Statements, Objects and variants. Visual BASIC debugging tools. Runtime errors handling.

Object Oriented Programming-Create Objects and Classes, Creating special properties of classes, Enhancing the simple and object classes. Collections, Working with Objects and Collections.

### Unit – III

Designing User Interface-Elements of User Interface, Forms, Menus and Toolbars, Designing Menus and Tool-bars; Building Dynamic Forms, Drag-and-Drop Operations, working with menus, customizing the toolbars. ActiveX Controls - TextBox, Listbox, ComboBox, ScrollBox and Slider Controls Operations.

Generating Timed Events. Drawing with Visual Basic using Graphics controls, and Pixels with Visual Basic. Operations with Common Dialogs Control, TreeView and ListView Controls.

### Unit – IV

Recursive Programming-Binary Search, Scanning folders and Building a Custom Explorer. Creating Printed Outputs using the printer object and reports. Integrating with Microsoft Windows and MS Office 2007.

Database Programming with Visual Basic- Data access methods, Data Controls (OLE, ODBC, ADO), Creating, reading and writing text files. Data controls creating Queries.

#### Reference Books :

1. Petroustos Evangelos : Mastering Visual Basic 6.0; BPB Publications, 2002.
2. Norton's Peter: Guide to Visual Basic 6.0; Techmedia.

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- 3. Kurata Deborah: Doing Objects in Visual Basic; Techmedia.
- 4. Mastering database Programming with Visual Basic 6 by Petroutsos.

### MIT 211: Event Driven Programming (VB) Lab

Practical Lab)  
Examination : Practical Examination –

Exercises to be framed so as to cover the topics and tools covered in theory paper MScIT 206.

### MIT 212: 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 MScIT 204.

### MIT 213: Web Authoring Tools

Practical Lab  
Examination : Practical Examination

Exercises to be framed so as to cover the topics and tools covered in theory paper MScIT 202.

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## Course Content in Detail- M.Sc.(IT) III Semester (~~2012-2013~~)

### Note :

1. Papers I to IV are all compulsory and paper V and paper VI are elective core courses. Each elective core course will be chosen out of two elective core courses.
2. Internal assessment will be done by teacher concerned on the basis of test papers, regularity in the class and performance of the candidate. Maximum marks in internal assessment of each paper is 100.

### MIT 301 : 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 consist 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.

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**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 & Serlaker; Principles of Management.

### MIT 302 : 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 consist 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, API. 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.

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**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 .

**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.

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

**Reference/Text Books:**

1. Patrick Naughton, Herbert Schildt., Java, The Complete Reference: 7<sup>th</sup> Edition Osborne/McGraw-Hill 2006.
2. E. Balagurusamy :Programming with Java - Tata McGrawhill Publishers , II Edition.
3. Khalid A. Mughal, Rolf W. Rasmussen; A programmer's Guide to Java Certification(2<sup>nd</sup> 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 , Orielly
7. Bruce Eckel: Thinking in Java, 4th Edition

**MIT 303 : 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 consist 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.

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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, Kmeans, 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, Pearson 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 PONNAIAH WILEY STUDENT EDITION.

**MIT 304 : 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 consist 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**

**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 EDI, EDI model; EDI Implementation, MIME and Value-Added Network, Internet-based EDI.

**Unit II**

**E-Commerce Models**: B2C, B2B, C2C, C2B, other models – Brokerage Model, Aggregator Model, Info-mediary 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 Corporates, 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 – Frameroork 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.

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- (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.

## MIT 305A : 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 consist 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 AI. 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.

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**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

OR

### MIT 305B : 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 consist 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.

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## 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-Hellman 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.

**MIT 306 A : Advance 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 consist 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

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**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, ServerSocket, IPAddress, URL connections;

**Java Applets:** Introduction, Applet Architecture The java.applet.Applet Class, The Five Stages of an Applet's 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 – IIOP implementation – CORBA – IDL 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, PreparedStatement and CallableStatement); ResultSet, ResultSetMetaData; 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

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Session Beans, Stateful vs. Stateless Session Beans, Working with Entity Beans, Message Driven Beans

**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 Servlets and JSP", Shroff Publishers and Distributors, Mumbai, 2007.
6. Marty Hall and Larry Brown, "Core Servlets and JavaServer Pages: volume 1: core technologies", Pearson Education, USA, 2008.
7. Marty Hall, "Core Servlets 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.

**OR**

**MIT 306B : Application Development Using .NET Frame Work**

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 consist 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 Studio .NET, Using the .NET Framework.

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

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

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

### 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, showDialog() 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:** Applications 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 Intrinsic Controls, 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 Fundamentals-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:**

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1. Matthew MacDonald : Beginning ASP.NET 4.0 in C# 2010 , 3<sup>rd</sup> Edition , APres.
2. Bill Eyjen, Scott Hanselman, Devin Rader : Professional AS P.NE T 4 , 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 Programmer 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.

### MIT 311 Programming in Java Lab

Practical Lab : 6 Hours per Week (4 Credits)  
 Examination : Practical Examination – 4 Hours Max. Marks- 100

Lab Exercises based on Theory Paper MIT 302

### MIT 312 Advanced Java Programming Lab

Practical Lab : 6 Hours per Week (4 Credits)  
 Examination : Practical Examination – 4 Hours Max. Marks- 100

Lab Exercises based on Theory Paper MIT 306A

OR

### MIT 312 Application Development Using .NET Frame Work Lab

Practical Lab : 6 Hours per Week (4 Credits)  
 Examination : Practical Examination – 4 Hours Max. Marks- 100

Lab Exercises based on Theory Paper MIT 306B

### MIT 323 Mini Project

Practical Lab : 6 Hours per Week (4 Credits)  
 Examination : Practical Examination – 4 Hours Max. Marks- 100

Technology : Use .NET /Java/Web Technology.

*P. Khan*      *PSD* ~~30/6/12~~      *30/6/12*