

2016-  
17

# Multani Mal Modi College

Unit Planning of M.Sc(IT)



**MULTANI MAL MODI COLLEGE, PATIALA**

**UNIT PLAN**

**Class – M.Sc. (IT)-1st year, Sem(I)**

**MS-111: Introduction to Information Technology**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

**TILLMST-I**

- **Computer Fundamentals:** Block structure of a computer, characteristics of computers, problem solving with computers, generations of computers, classification of computers on the basis of capacity, purpose, and generation.
  - **Number System:** Decimal, hexadecimal, and octal systems, conversion from one system to the other.
  - **Binary Arithmetic:** Addition, subtraction and multiplication.
- Assignment-1**
- **Memory types:** Magnetic core, RAM, ROM, Secondary, Cache,
  - **Input and Output Units:** functional characteristics; Overview of storage devices: floppy disk, hard disk, compact disk, tape;
  - **Printers:** Impact, non-impact. Graphical I/O devices: Light pen, joystick, Mouse, Touch screen; OCR, OMR, MICR

**TILLMST-II**

- **Computer languages:** Machine language, assembly language, high level language, 4GL. Compiler, Interpreter, Assembler, System Software, Application Software.
  - **Operating system:** Functions of an operating system, Batch, multi-programming, time sharing, multi-processor, Multi-tasking.
- Assignment-2**
- **Data Network and Communication:** Network types, Transmission Modes, Network topologies,
  - **Internet:** Evolution of Internet, E-mail WWW, FTP, TELNET, IRC, Video Conferencing.
  - **Information Technology and Society:** Applications of Information Technology in Railway, Airline, Banking, Insurance, Inventory Control, Hotel Management, Education, Mobile Phones, Information Kiosks, Weather Forecasting, Scientific Application,

**TILLFINAL EXAM**

- **E-Commerce:** Meaning, its advantages & limitations, Types of E-Commerce.
- **Multimedia:** Concepts, Components and Application, Entertainment Marketing.

**Mode of Assessment**

Sr. No.	Component	Weightage
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

**MS-112: Computer Programming using C**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

<b>TILLMST-I</b>		
<ul style="list-style-type: none"> <li>• Problem Solving with Computers, c character set, identifier, constants, variables, rules for defining variables, Data types,</li> <li>• <b>operators:</b> arithmetic, relational, logical, comma, conditional, assignment, arithmetic expressions, input and output statements, assignment statements.</li> <li>• <b>Decision statement:</b>if,if ---else, nested if, switch statement, break statement, continue statement, go to statement.</li> <li>• <b>Assignment-1</b></li> <li>• <b>Loops and control statements:</b> While loop, for loop and do-while loop, nested loops</li> <li>• <b>Arrays:</b> one dimensional Array, multi-dimensional arrays, array initialization.</li> </ul>		
<b>TILLMST-II</b>		
<ul style="list-style-type: none"> <li>• <b>Pointers:</b> Pointer data type, pointers and arrays, pointers and functions.</li> <li>• <b>Functions:</b> definition, declaration, function prototype, types of functions, call by value, call by reference, recursion, processing character strings.</li> <li>• <b>Assignment-2</b></li> <li>• <b>Structures:</b> Using structures, arrays of structures and arrays in structures, union</li> </ul>		
<b>TILLFINAL EXAM</b>		
<ul style="list-style-type: none"> <li>• <b>Files in C:</b> Sequential files, random access files , Unformatted files, Text files, binary files</li> </ul>		
<b>Mode of Assessment</b>		
Sr. No.	Component	Weightage
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

**MS-113 :Computer Organisation and Architecture**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

## TILLMST-I

- Concepts about bits, bytes and word, Number System: Number conversions, Arithmetic operations, Integer and floating-point representation.
- Character codes (ASCII, EBCDIC, BCD, 8421, Excess-3). Boolean expression - Minimization of Boolean expressions -- Minterm - Maxterm - Sum of Products (SOP) - Product of Sums (POS) - Karnaugh map Minimization - Don't care conditions - Quine-McCluskey method of minimization.

### Assignment-1

- Basic Gates, Combinational logic design: half-adder, full adder, half subtractor, full subtractor, binary parallel adder, Multiplexer/ Demultiplexer, decoder, encoder.
- Sequential circuits: concept, flip-flops (D, RS, JK, JK-Master-Slave, T), counters (Ripple, Asynchronous, Synchronous, Decade, Mod-5),
- Instruction codes, Instruction formats, Instruction cycle, Addressing modes.

## TILLMST-II

- Register Transfer Language, Arithmetic, Logic and Shift micro-operations, Arithmetic Logic Shift unit.
- Control Memory: Design of control unit, Microprogrammed and Hardwired control unit (overview only), Features of RISC and CISC.

### Assignment-2

- Memory organisation: Concepts of semiconductor memory, CPU- memory interaction, organization of memory modules, Cache memory and related mapping and replacement policies, Virtual memory.

## TILLFINAL EXAM

- I/O organization: I/O interface, Modes of data transfer: Programmed I/O, Interrupt initiated I/O, DMA.

### Mode of Assessment

Sr. No.	Component	Weightage
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

**MS-114 :Mathematical Foundation of Computer Science**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

**TILLMST-I**

- Logic: Propositions, Implications, Precedence of Logical Operators, translating English Sentences, System Specifications. Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Order of Quantifiers, Sets, Power Set, Set Operations, Functions, One-to-One Functions and Onto Functions, Inverse and Composition of Functions, Floor Function, Ceiling Function.

**Assignment-1**

- Algorithms, Searching Algorithms, Sorting, Growth of Functions, Big-O Notation, Big-Omega and Big-Theta Notation, Complexity of Algorithms, Mathematical Induction, The Basic of counting, The Pigeonhole Principle.

**TILLMST-II**

- Recurrence Relations, solving recurrence relations, Divide and Conquer Algorithms and Recurrence Relations, Generating functions for sorting recurrence relations, Inclusion-Exclusion.

**Assignment-2**

- Relations and their properties, n-ary relations and their applications, representing relations, closure of relation, equivalence relations, partial ordering.

**TILLFINAL EXAM**

- Graphs: Introduction, terminology, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamiltonian Paths, Shortest Path Problems, Planar Graphs.

**Mode of Assessment**

<b>Sr. No.</b>	<b>Component</b>	<b>Weightage</b>
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

**MS-115: Operating System**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

## TILLMST-I

- **Introduction to Operating System:** Definition, Types of Operating system, Operating system components, Operating system services.
  - **Process Management:** Process concept, Process cs. threads, CPU scheduling criteria, Scheduling algorithms, and Algorithm evaluation
- Assignment-1**
- **Memory Management:** Background, logical vs. physical address space, Contiguous memory management schemes using Multi partition memory allocation using fixed number of tasks and variable number of tasks, paging and segmentation.
  - **Virtual Memory management:** Concept, demand paging and demand segmentation.

## TILLMST-II

- **File Management:**File concept, Access methods, directory structure, Allocation methods – contiguous, linked and indexed.
  - **Mass storage structure:** Disk structure, disk scheduling algorithms.
- Assignment-2**
- **Deadlocks:** Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, avoidance, detection and recovery.
  - **Protection:** Goals of protection, Access matrix.

## TILLFINAL EXAM

- **Security:** Security problem, Program threats, system threats, User Authentication, Cryptography.

### Mode of Assessment

Sr. No.	Component	Weightage
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

## M.Sc(IT)-1st year, Sem.- II

### MS-121: Object Oriented Programming Using C++

Max Marks: 75

Maximum Time: 3 Hrs.

#### TILLMST-I

- **Evolution of OOP:** Procedure Oriented Programming, OOP Paradigm, Advantages and disadvantages of OOP over its predecessor paradigms. Characteristics of Object-Oriented Programming,
- **Introduction to C++:** Identifier, Keywords, Constants,
- **Operators:** Arithmetic, relational, logical, conditional and assignment. Size of operator, Operator precedence and associativity. Type conversion, Variable declaration, expressions, statements, manipulators. Input and output statements, stream I/O, Conditional and Iterative statements, breaking control statements.
- Storage Classes, Arrays, Arrays as Character Strings, Structures, Unions, Bit fields, Enumerations and User defined types.

##### Assignment-1

- **Pointers:** Pointer Operations, Pointer Arithmetic, Pointers and Arrays, Multiple indirections, Pointer to functions. Functions: Prototyping, Definition and Call, Scope Rules. Parameter Passing: by value, by address and by reference, Functions returning references, Const functions, recursion, function overloading, Default Arguments, Const arguments, Pre-processor, Type casting.
- **Classes and Objects:** Class Declaration and Class Definition, defining member functions, making functions inline, Nesting of member functions, Members access control. this pointer. Objects: Object as function arguments, array of objects, functions returning objects, Const member.
- Static data members and Static member functions, Friend functions and Friend classes

#### TILLMST-II

- **Constructors:** properties, types of constructors, Dynamic constructors, multiple constructors in classes.
  - **Destructors:** Properties, Virtual destructors. Destroying objects. Rules for constructors and destructors.
  - Array of objects. Dynamic memory allocation using new and delete operators, Nested and container classes, Scopes: Local, Global, Namespace and Class.
- ##### Assignment-2
- **Inheritance:** Defining derived classes, inheriting private members, single inheritance, types of derivation, function redefining, constructors in derived class, Types of inheritance, Types of base classes, Code Reusability.
  - **Polymorphism:** Methods of achieving polymorphic behavior.

- Operator overloading: overloading binary operator, overloading unary operators, rules for operator overloading, operator overloading using friend function. Function overloading: early binding,
- **Polymorphism** with pointers, virtual functions, late binding, pure virtual functions and abstract base class
- Difference between function overloading, redefining, and overriding.

## TILLFINAL EXAM

- **Templates:** Generic Functions and Generic Classes, Overloading of template functions.
- Exception Handling catching class types, handling derived class exceptions, catching exceptions, restricting exception, rethrowing exceptions, terminate and unexpected, uncaught exceptions.
- **Files and streams:** Classes for file stream operations, opening and closing of files, stream state member functions, binary file operations, structures and file operations, classes and file operations, I/O with multiple objects, error handling, sequential and random access file processing

### Mode of Assessment

Sr. No.	Component	Weightage
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%



MS-122 :DATA & FILE STRUCTURES

Max Marks: 75

Maximum Time: 3 Hrs.

## TILLMST-I

- **Data Structure:** Introduction to data structure and algorithm Algorithm analysis: Time space trade off algorithms and Big O notation Arrays: Introduction, one dimensional and multidimensional arrays, memory representation of arrays, operations on arrays, sparse arrays and sparse matrices and their implementation, Advantages and limitation of arrays.
- **Stacks:** Introduction; Operation on stacks; Implementation of stacks Application of stacks: matching parenthesis, evaluation of arithmetic expressions, conversion from infix to postfix, recursion.
- **Assignment-1**
- **Queues:** Introduction, operation on queues, circular queue, memory representation of queues, dequeues, priority queues, application of queues.
- **Linked List:** Introduction; operation on linked list, circular linked list, doubly linked list, header linked list, implementation of linked list, application of linked lists.
- **Trees:** Introduction; Binary Tree; Threaded Binary Trees; Binary Search Tree; Balanced Trees; B-Trees; Heap

## TILLMST-II

- **Graphs:** Introduction Graph: Graph terminology Memory Representation of Graphs: adjacency matrix representation of graphs, adjacency list or linked representation of graphs Operations performed on graphs Application of graphs
- **Sorting:** Selection Sort, Insertion Sort, Merge Sort, Bucket Sort, Radix Sort, Quick Sort and Heap Sort
- **Assignment-2**
- **Hashing:** Hashing techniques; Collision resolution; Deleting items from a hash table; Application of hashing
- **File Organization:** Introduction
- **External Storage Device:** Sequential Access Storage Device (SASD), Direct Access Storage Device (DASD) Sequential File Organization: processing sequential files, operations on sequential files, advantages and disadvantages of sequential file organization Direct File Organization: introduction, processing of direct files, advantages and disadvantages of direct organization

## TILLFINAL EXAM

- **Indexed Sequential Organization:** introduction, processing of indexed sequential files, advantages and disadvantages of indexed sequential organization.

<b>Mode of Assessment</b>		
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1	Mid Semester Test (MST)	40% (Average of 2 MST)
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**MS-123 : Visual Basic**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

**TILLMST-I**

- Introduction to Visual Basic: - Creating User Interfaces with Windows Common Controls, Creating Menus for Programs, Advance Design Features, Working with Collections, Creating Classes in a Program, Working with Active Data Objects.
- Working with forms, drawing with VB, Multiple document interface, basic Active X controls, advanced active X controls.

**Assignment-1**

- Extending the Capabilities of Visual Basic: - Declaring and using External Functions,
- Creating ActiveX Control with Visual Basic
- Communicating with Other Programs: - Using ActiveX Server, Creating ActiveX Client Applications.

**TILLMST-II**

- Integrating Visual Basic with the Internet: - Writing Internet Application with Visual Basic, Web Browsing objects, using document object, Active Server Pages, using web browser controls, using history objects.

**Assignment-2**

- Creating Database Applications: - Accessing Data with Data Control.

**TILLFINAL EXAM**

- Using visual data manager, validating data, selected data with SQL, advanced data bound controls, active data objects, ADO data objects.

**Mode of Assessment**

<b>Sr. No.</b>	<b>Component</b>	<b>Weightage</b>
1	Mid Semester Test (MST)	40% (Average of 2 MST)
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3	Attendance	20%

**MS-124 : RDBMS & Oracle**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

## **TILLMST-I**

- Introduction: Database Approach, Characteristics of a Database Approach, Database System Environment.
- Roles in Database Environment: Database Administrators, Database Designers, End Users, Application Developers.
- Database Management Systems: Definition, Characteristics, Advantages of Using DBMS Approach, Classification of DBMSs.
- Architecture: Data Models, Database Schema and Instance, Three Schema Architecture, Data Independence – Physical and Logical data Independence.

### **Assignment-1**

- Database Conceptual Modelling by E-R model: Concepts, Entities and Entity Sets, Attributes, Mapping Constraints, E-R Diagram, Weak Entity Sets, Strong Entity Sets.
- Relational Data Model: Concepts and Terminology
- Constraints: Integrity Constraints- Entity and Referential Integrity constraints, Keys- Super Keys, Candidate Keys, Primary Keys, Secondary Keys and Foreign Keys.
- Relational Algebra: Basic Operations, Additional Operations, Example Queries.
- Relational Calculus: Tuple and Domain Relational Calculus, Example Queries.
- Database Design: Problems of Bad Database Design,
- Normalization: Functional Dependency, Full Functional Dependency, Partial Dependency, Transitive Dependency, Normal Forms– 1NF, 2NF, 3NF, BCNF, Multi-valued Dependency, Join Dependency and Higher Normal Forms- 4NF, 5NF.

## **TILLMST-II**

- Transaction Processing Systems: Batch, On-line, Real time, Transaction ACID Properties
- Database Protection: Security Issues, Discretionary Access Control-Granting and Revoking Privileges
- Database Concurrency: Problems of Concurrent Databases, Serializability and Recoverability, Concurrency Control Methods-Two Phase Locking, Time Stamping,
- Database Recovery: Recovery Concepts, Recovery Techniques-Deferred Update, Immediate Update, Shadow Paging.

### **Assignment-2**

- Overview of the following:
- Data Mining, Data Warehousing and OLAP, Mobile Databases, Multimedia Databases, Temporal Database, Spatial Database
- Technical Introduction to Oracle: Structure of Oracle, Background Processes.

## TILLFINAL EXAM

- Data Objects: Tables, Views, Synonyms, Indexes, Snapshots, Sequences, Creation and Manipulation of Data Objects. SQL Queries. Applying Integrity Constraints. Functions, Procedures and Packages. Using Cursors and Triggers

Mode of Assessment		
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1	Mid Semester Test (MST)	40% (Average of 2 MST)
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**MULTANI MAL MODI COLLEGE, PATIALA**

**UNIT PLAN**

**Class – M.Sc. (IT)-IIInd year, Sem.- III**

**MS-211 :Web Technology**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

**TILLMST-I**

- Introductory:
  - Internet Basics: Networks, Protocols, TCP/IP, Internet Addresses, Ports, Sockets, Name Resolution, Firewalls, Protocol Tunneling, Proxy Servers, Internet Standards, governing the web HTTP, MIME, Inside URLs, Web applications, Overview of clients/servers web communication, comparison of web servers, Common Gateway Interface CGI.
- Assignment-1**
- Web Page Designing:
  - Introduction to markup languages;
  - HTML: list, table, images, frames, forms, pages style sheets CSS;
  - XML: DTD, XML Namespaces, XML schemes, Presenting XML with CSS and XSLT, XML-DOM, what is XHTML?

**TILLMST-II**

- Client-Side Scripting:
  - Java script: Introduction, documents, forms, statements, functions, objects;
  - Event and event handling; Browsers and the DOM, J Query: Syntax, Selectors, Events and AJAX methods.
- Assignment-2**
- Server-Side Programming
  - PHP: Introduction, requirements, PHP syntax, datatype, variables, strings, operators, if-else, control structure, switch, array, function, file handling, form, sending email, file upload, session/state management, error and exception, PHP Database for dynamic Web pages.

**TILLFINAL EXAM**

- Introduction to Servlets: Servlet Basic Servlet Structure, Servlet Lifecycle, Servlet APIs. Writing thread safe Servlets. Setting Cookies and Session Management with Servlet API.

**Mode of Assessment**

<b>Sr. No.</b>	<b>Component</b>	<b>Weightage</b>
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

**MS-212 :Java Programming**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

**TILLMST-I**

- Introduction to Java, Why java is important to the Internet, Object Oriented Programming, Data types, Variables, Arrays, the Simple types, Floating Point Types, Operators, Arithmetic Operators. The Bit wise operators, Relational Operator's, Boolean, Logical Operators, Control Statements.

**Assignment-1**

- Introducing Classes : Class fundamentals, declaring objects, Assigning object Reference, Variables, Introducing Methods, Constructors, this keyword, Garbage collection, Overloading Using Objects and parameters, Argument Passing, Returning Objects, Recursion, Access Control, Static, Nested & Inner Classes. Exploring String class using command line Arguments. Inheritance.

**TILLMST-II**

- Packages : Defining a package, CLASSPATH, Access protection, Importing Packages, Defining an interface, Implementing Interface.

**Assignment-2**

- Exception handling fundamentals, Exception types, using try & catch, throw, throws, Java's Built in Exceptions, Creating your own Exception subclasses.

**TILLFINAL EXAM**

- Threading, Multithreading, Applets, Event handling, Introduction of AWT.

**Mode of Assessment**

<b>Sr. No.</b>	<b>Component</b>	<b>Weightage</b>
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

**MS-213 :Software Engineering**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

**TILLMST-I**

- **Software Engineering:** History, Definition, Goal; The role of the Software Engineer, The Software Life Cycle, The relationship of Software Engineering to other areas of Computer Science, Classification of Software Qualities, Representative Qualities, Software process models: Waterfall model, prototyping, spiral; Tools and techniques for process modeling, Management of software engineering management functions, project planning and organization.  
**Assignment-1**
- **Requirement Analysis:** The requirement process, types of requirements, Characteristics and components of SRS, Data flow Diagrams, Data Dictionary, UML diagrams for specifying behaviors, metrics, verification of SRS.
- **Design and Software architecture:** The Software design activity and its objectives, Abstraction, Modularity, Coupling-Cohesion criteria, Object-Oriented Design: generalization and specialization, associations and aggregations.

**TILLMST-II**

- Coding: Programming standards and procedures, programming guidelines, documentation, and Code verification techniques.
- **Verification and validation:** Approaches to verification, testing goals, principles,  
**Assignment-2**
- Equivalence class partitioning, Boundary value analysis, mutation testing, graph-based testing, cyclomatic complexity, test planning, automated testing tools, features of Object-Oriented testing.

**TILLFINAL EXAM**

- **Software maintenance:** The nature of maintenance, maintenance problems, maintenance techniques and tools.

<b>Mode of Assessment</b>		
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1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%



**MS-214 :Computer Networks**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

<b>TILLMST-I</b>		
<ul style="list-style-type: none"> <li>• <b>Computer networks:</b> uses of computer networks, Goals and applications of networks, computer network structure and architecture, reference models: OSI model, TCP/IP model, Comparison of TCP/IP and OSI models, Introduction to Novell Netware, and ARPANET.</li> <li>• <b>Medium Access Sublayer :</b> Static and dynamic channel allocation for LAN and MAN ALOHA Protocols, <b>Assignment-1</b></li> <li>• <b>LAN Protocols :</b> CSMA, CSMA/CD, Collision Free protocol, BRAP, MLMA, Binary countdown, Limited contention protocol, Urn Protocol, Adaptive tree walk protocol.</li> <li>• <b>Networking and Internetworking devices:</b> Repeater, bridges, routers, gateways, switches.</li> </ul>		
<b>TILLMST-II</b>		
<ul style="list-style-type: none"> <li>• <b>High speed LAN:</b> FDDI, Fast Ethernet, HIPPI, Fiber channel.</li> <li>• <b>LAN IEEE 802.x standards.</b></li> <li>• Routing: Static vs. Dynamic Routing, various Routing Algorithms.</li> <li>• Congestion Control: Causes of Congestion, Various Congestion Control Strategies and Algorithms <b>Assignment-2</b></li> <li>• Mobile telephone, mobile telephone switching office.</li> <li>• <b>Internet protocols:</b> Principles of Internetworking, connectionless internetworking, Internet protocols, IPv6.</li> </ul>		
<b>TILLFINAL EXAM</b>		
<ul style="list-style-type: none"> <li>• <b>Network Security:</b> Security requirements and attacks, encryption Public key encryption and digital Signatures. distributed applications: SNMP, SMTP, HTTP.</li> </ul>		
<b>Mode of Assessment</b>		
<b>Sr. No.</b>	<b>Component</b>	<b>Weightage</b>
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

**M.Sc. (IT)-IIInd year, Sem.-IV**

**MS 221 :Computer Graphics**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

**TILLMST-I**

- Graphics Hardware: The Functional characteristics of the systems are emphasized.
- Input devices: Keyboard, Touch panel, Light pens, Graphic tablets, Joysticks, Trackball, Data glove, Digitizer, Image scanner, Mouse, Voice Systems.
- Hard copy devices: Impact and non impact printers, such as line printer, dot matrix, laser, ink-jet, electrostatic, flatbed and drum plotters.
- Video Display Devices: Refresh cathode -ray tube, raster scan displays, random scan displays, colour CRT-monitors, direct view storage tube, flat-panel displays, 3-D viewing devices, virtual reality, raster scan systems, random scan systems, graphics monitors and workstations

**Assignment-1**

- Scan conversion algorithms for line, circle and ellipse, Bresenham's algorithms, area filling techniques, character generation.
- 2-dimensional Graphics: Cartesian and Homogeneous co-ordinate system, Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Composite transformations, affine transformation, Two dimensional viewing transformation and clipping (line, polygon and text).

**TILLMST-II**

- 3-dimensional Graphics: Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Composite transformations, Mathematics of Projections (parallel & perspective). 3-D viewing transformations and clipping.

**Assignment-2**

- Hidden line and surface elimination algorithms, z-buffer, scan-line, sub-division, Painter's algorithm.
- Illumination Models: Diffuse reflection, Specular reflection, refracted light, texture surface patterns, Halftoning, Dithering

**TILLFINAL EXAM**

- Surface Rendering Methods: Constant Intensity method, Gouraud Shading, Phong Shading.

**Mode of Assessment**

<b>Sr. No.</b>	<b>Component</b>	<b>Weightage</b>
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

## MS-222 : Linux Administration

Max Marks: 75

Maximum Time: 3 Hrs.

### TILLMST-I

- **Introduction:** Overview of Linux, Linux's History, Advantages of Linux, Minimum System Requirements; **Installing Linux:** Choosing Text or Graphics Installation, Setting up your Hard Drive, Understanding the Swap Space, Creating the Linux File-system partition, Setting up the mouse, root password and Ethernet, Configuration X, Selecting packages to Install, Creating the Boot Disk.
- **Using LILO boot manager:** Installing LILO, LILO make-file, Updating LILO, Removing or Disabling LILO, Troubleshooting LILO. The Boot Process, Startup Scripts, Shutdown, Halt and reboot, Creating a New Login, Virtual Terminals, Running as root.
- **Basic Linux Commands :** How Linux Commands Work, Command Options & Parameters, Input and Output Redirection, Mian pages, Wildcards : \* and ?, Environment Variables, The process status Commands : ps, termination command : kill, the su command, the grep command.  
**Assignment-1**
- **Linux File System :** Common types of files, filenames, Inodes, The root directory, How directories are named, Navigating the Linux file System : pwd command, Absolute and relative filenames; cd command, Creating and Deleting files : Cat, Creating Directories, Moving and Copying files, Moving Directories, Removing files and directories, Important directories in the Linux file System : / , /home, /bin, /usr, /usr/bin, /var/spool, /dev, /sbin, /etc.
- File and Directory ownership, Groups, Changing group ownership, File Permissions, UMASK Setting, Changing File Permission, Changing directory permissions; Bash : What is Shell ? How the Shell gets Started, The most common Shells;

### TILLMST-II

- **Shell Scripting:** Creating and Executing Shell Programs, Using variables : Assigning a value to a variable, Accessing the value of a variable, Positional Parameters and other Built-In Shell Variables; Special Characters, Conditional Statements : if Statement , case Statement; Iteration Statements : for Statement, while Statement, until Statement, shift Command, select Statement, repeat Statement, Functions.  
**Assignment-2**
- **Editing and Typesetting:** Text Editors vi, The vi Editor, Starting vi, vi modes, Inserting Text, Quitting vi, Moving the Cursor, Deleting Text, Copying and Moving Text, Searching and Replacing Text, Setting Preferences.
- **Configuring the X Window:** Xfree86 Software Distribution, Choosing an X Server, Installing Xfree86 Manually, Installing Xfree86 using a Script, Path Environment Variable; Configuring Xfree86; The xconfig and XF86Config Files in Detail: Pathnames, Keyboard Setting, Mouse Definition, Monitor Model, Video Cards, The Xfree86 Server, Testing Xfree86 Configurations, The .xinitrcFile.
- **Linux for System Administrators:** System Administration Basics, The root Account, Starting and Stopping the System, Booting from a Floppy, Using LILO to Boot, Shutting Down Linux; Mounting

- File Systems : Mounting a Floppy, CD-ROM, Creating a New file System, Un-mounting file Systems, Backup and restore: Compressing files with gzip, Using tar and cpio; Setting up your System : Setting the System Name, Using a Maintenance Disk, Forgetting the root Password, Setting the Login Message.

## TILLFINAL EXAM

- **Networking & Network Services:** What is TCP/IP? IP Address, Ports, Sockets, Subnets, Routing, Hardware Requirements, Configuring the Network, Configuration Files, Testing and Troubleshooting, The net start Command, ping, traceroute, Mail, News, NFS, www, FTP, Telnet, DNS.
- Network Security: Firewalls.

### Mode of Assessment

Sr. No.	Component	Weightage
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

## MCA-223: Modern Information Systems

Max Marks: 75

Maximum Time: 3 Hrs.

### TILLMST-I

- Introduction to Systems and Basic Systems Concepts, Types of Systems, Information Systems: Definition and Characteristics, Types of Information, Role of Information in Decision Making, Types of an Information system: Operations Support Systems and Management Support Systems, Comparison of EDP/MIS/DSS.
- An overview of Management Information System: Definition and Characteristics, Components of MIS, Frame Work for Understanding MIS: Robert Anthony's Hierarchy of Management Activity, Information requirements and Levels of Management, Simon's Model of decision- Making.  
**Assignment-1**
- Functional Information Systems: A Study of Marketing, Personnel, Financial and Production information systems, Input transaction documents, applications and reports of Marketing, Personnel, Financial and Production information systems.

### TILLMST-II

- Models for functional information systems.
- Concept of Knowledge: Definition and characteristics of knowledge, Difference between data, information and knowledge, Knowledge versus experience.  
**Assignment-2**
- Types of knowledge: Explicit and Tacit knowledge. Nonaka and Takeuchi theory of knowledge creation: Socialization, Externalization, Combination and Internalization (SECI) Model

### TILLFINAL EXAM

- Introduction to knowledge management and knowledge management systems. The process of knowledge management: Creation/ capture, storage and retrieval, transfer and application.

#### Mode of Assessment

Sr. No.	Component	Weightage
1	Mid Semester Test (MST)	40% (Average of 2 MST)
2	Written Assignments	40%
3	Attendance	20%

**MS- 224 : Artificial Intelligence**

**Max Marks: 75**

**Maximum Time: 3 Hrs.**

<b>TILLMST-I</b>
<ul style="list-style-type: none"> <li>• <b>Introduction to AI</b> :Definition, Nilsson's Onion Model explaining basic Elements of AI and AI application Areas.</li> <li>• <b>Introduction to Propositional Logic</b>: Syntax, Semantics, Inference methods in Propositional Logic.</li> <li>• <b>Introduction to Predicate Logic</b>: Syntax, Semantics of Predicate Logic, Clausal form, Resolution, Unification, Inference Mechanisms.</li> <li>• <b>Knowledge Based Systems</b> : Meaning of Knowledge, Types of Knowledge, Components of Knowledge Base System.</li> </ul> <p><b>Assignment-1</b></p> <ul style="list-style-type: none"> <li>• <b>Knowledge Representation</b> : Approaches to Knowledge representation, Issues in Knowledge representation, Knowledge representation using rules. Semantic Nets, Frames, Conceptual Dependencies, Scripts, CYC.</li> <li>• <b>Knowledge Acquisition</b> :Definition, General Learning Model, Types of Learning, Factors affecting Learning.</li> <li>• <b>Knowledge organization &amp; Manipulation</b>: Introduction, Issues in organization and manipulation.</li> </ul>
<b>TILLMST-II</b>
<ul style="list-style-type: none"> <li>• <b>Dealing with uncertainty</b>: Symbolic reasoning under uncertainty-Introduction and logics for Non-monotonic reasoning, Implementation issues.</li> <li>• <b>Prolog Programming</b>: Features of Prolog, Elementary Data Types, Compound objects in Prolog, Writing simple program in Prolog, Understanding Default flow control of the Prolog Program, Controlling Program Flow with cut and fail, List Manipulation, String manipulation, Arithmetic operators, Input /Output statement.</li> </ul> <p><b>Assignment-2 Expert systems</b>: Basic Components &amp; architecture of Expert systems, representing and using domain knowledge, ES-Shells.</p>
<b>TILLFINAL EXAM</b>
<ul style="list-style-type: none"> <li>• <b>Applications of AI</b> : Game Playing-The minmax Search Procedure, Adding Alpha-beta Cutoff's Planning-Overview, Components of Planning System, Natural Language processing : Overview, Syntactic processing, Semantic analysis, Morphological, Discourse and Pragmatic processing</li> </ul>

<b>Mode of Assessment</b>		
<b>Sr. No.</b>	<b>Component</b>	<b>Weightage</b>
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2	Written Assignments	40%
3	Attendance	20%