# Punjab Technical University Jalandhar

# Syllabus Scheme

**(1st to 4th Semester)**

**For**

**Master of Science**

# Information Technology (M.Sc.- IT)

**Implemented**

**From Aug. 2005 and onward**

# PUNJAB TECHNICAL UNIVERSITY, JALANDHAR

## SCHEME OF TEACHING FOR M. Sc. (IT)

### *SEMESTER-I*

| COURSE NO. | SUBJECT | L | P | TOTAL | MARKS INT. | Marks EXT. | TOTAL MARKS |
|---|---|---|---|---|---|---|---|
| MSIT-101 | Computer Fundamentals | 24 | 24 | 48 | 25 | 75 | 100 |
| MSIT-102 | Programming in C | 24 | 24 | 48 | 25 | 75 | 100 |
| MSIT-103 | C++ & data structures | 24 | 24 | 48 | 25 | 75 | 100 |
| MSIT-104 | Web Tecnologies | 24 | 24 | 48 | 25 | 75 | 100 |
| MSIT-105 | Operating Systems | 48 | 0 | 48 | 25 | 75 | 100 |
| MSIT-106 | Communication & Soft Skills | 30 | 0 | 30 | 50 | - | 50 |
| MSIT-107 | Software Lab-I        (C & C++) | - | - | - | 25 | 75 | 100 |
| **TOTAL** | | **174** | **96** | **270** | **200** | **450** | **650** |

### *SEMESTER-II*

| COURSE NO. | SUBJECT | L | P | TOTAL | MARKS INT. | Marks EXT. | TOTAL MARKS |
|---|---|---|---|---|---|---|---|
| MSIT-201 | Computer Networks | 48 | 0 | 48 | 25 | 75 | 100 |
| MSIT-202 | RDBMS | 36 | 36 | 72 | 25 | 75 | 100 |
| MSIT-203 | Software Engineering & Project Management | 48 | 0 | 48 | 25 | 75 | 100 |
| MSIT-204 | Visual Basic Programming | 36 | 36 | 72 | 25 | 75 | 100 |
| MSIT-205 | Project (RDBMS & VB) & Viva | - | - | - | 25 | 75 | 100 |
| **TOTAL** | | **168** | **72** | **240** | **125** | **375** | **500** |

### *SEMESTER-III*

| COURSE NO. | SUBJECT | L | P | TOTAL | MARKS INT. | Marks EXT. | TOTAL MARKS |
|---|---|---|---|---|---|---|---|
| MSIT-301 | C# with .net | 24 | 24 | 48 | 25 | 75 | 100 |
| MSIT-302 | Operating System Administratin with Windows 2000 | 24 | 24 | 48 | 25 | 75 | 100 |
| MSIT-303 | Advanced Web Development | 24 | 24 | 48 | 25 | 75 | 100 |
| MSIT-304 | WAP & WML | 24 | 24 | 48 | 25 | 75 | 100 |
| MSIT-305 | Java Programming | 24 | 24 | | 25 | 75 | 100 |

| MSIT-306 | Software Lab-II (C# & Java) | - | - | - | 25 | 75 | 100 |
| MSIT-307 | Software Lab-III (Web Design & WML) | - | - | - | 25 | 75 | 100 |
| TOTAL | | 120 | 120 | 192 | 175 | 525 | 700 |

*SEMESTER-IV*

| COURSE NO. | SUBJECT | L | P | TOTAL | MARKS INT. | Marks EXT. | TOTAL MARKS |
|---|---|---|---|---|---|---|---|
| MSIT-401 | Linux Administration | 36 | 36 | 72 | 25 | 75 | 100 |
| MSIT-402 | Database Administration | 24 | 24 | 48 | 25 | 75 | 100 |
| MSIT-403 | Management Information Systems | 48 | 0 | 48 | 25 | 75 | 100 |
| MSIT-404 | Advanced Java Programming | 36 | 36 | 72 | 25 | 75 | 100 |
| MSIT-405 | Project (Advanced Java) & Viva | - | - | - | 25 | 75 | 100 |
| MSIT-406 | Software Lab-IV (Network Administration) | - | - | - | 25 | 75 | 100 |
| TOTAL | | 144 | 96 | 240 | 150 | 450 | 600 |

**Guidelines for Internal Assessment :**

The internal marks will be based on a continuous assessment and the following is to be adhered to :

- Test/Quiz's (15 Marks). Best 2 out of 3.
- Presentation/Reports/Home assignments  (5 Marks)
- Class attendance/General behaviour (5 marks)

**Guidelines for External Practical / Viva-Voce :**

The external practical /viva-voce will be conducted as per the details mentioned above in study scheme by an external examiner appointed by the University.

| MSIT-101 | COMPUTER FUNDATMENTALS |
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**INSTRUCTIONS FOR PAPER-SETTER**

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions (80-120 words) of 5 marks each.

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**INSTRUCTION FOR CANDIDATES**
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

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**Section-I**

**Introduction :** Characteristics of Computers; The Evolution of Computers; The Computer Generations  (First Generation(1942-1955), Second Generation (1955 – 1964), Third Generation (1964 – 1975), Fourth Generation (1975 – 1989), Fifth Generation (1989 – Present)).

**Basic Computer Organization :** Input Unit; Output Unit; Storage Unit; Arithmetic Logic Unit; Control Unit; Central Processing Unit; The  System Concept.

**Number Systems:** Non-Positional Number Systems; Positional Number Systems (Binary Number System, Octal  Number System, Hexadecimal Number System); Converting One number System to Another (Converting to Decimal from Another Base, Converting from Decimal to Another  Base (Division-Remainder Technique), Converting from a Base Other Than 10 to a Base Other Than 10, Shortcut  Method for Binary to Octal Conversion, Shortcut Method for Octal to Binary Conversion, Shortcut Method for Binary to  Hexadecimal Conversion, Shortcut Method  for Hexadecimal to Binary Conversion); Fractional Numbers.

**Processor and Memory :** The Central Processing Unit (CPU) (The Control Unit, The Arithmetic Logic Unit (ALU), Instruction Set, Registers, Processor Speed, Types of Processors); The Main Memory (Storage Evaluation Criteria, Main Memory Organization, Main Memory Capacity, RAM, ROM,  PROM and  EPROM, Cache Memory.

**Secondary Storage Devices :** Sequential and Direct-Access Devices; Magnetic Tape (Basic Principles of Operation, Types of Magnetic Tapes, Advantages and Limitations of Magnetic Tapes, Uses of Magnetic Disks); Optical Disk (Basic Principles of Operation,

Types of Optical Disks, Advantages and Limitations of Optical  Disks, Uses of Optical Disks); Mass Storage Devices (Disk Array, Automated Tape Library, CD-ROM Jukebox); Storage Hierarchy.

**Input-Output Devices :** Input Devices (Keyboard Devices, Point-and-Draw  Devices, Data Scanning Devices, Digitizer, Electronic Card Reader, Voice  Recognition Devices, Vision-Input System); Output Devices (Monitors, Printers, Plotters, Screen Image Projector, Voice Response Systems).

## Section-II

**Computer Languages :** Analogy with Natural Languages; Machine Language (Advantages and Limitations of Machine Language); Assembly Language (Assembler, Advantages of Assembly Language over Machine Language, Limitations of Assembly Language, Assembly Languages with Macro Instructions); High-Level Language (Compiler, Linker, Interpreter, Advantages and Limitations of High-Level Languages); Object-Oriented Programming Languages; Some High-Level Languages (FORTRAN, COBOL, BASIC, Pascal); Some More  High-Level Languages (C and C++, Java, RPG, LISP, SNOBOL); Characteristics of a Good Programming Language; Selecting a Language for Coding an Application; Subprogram.

**Application Software Packages :** Word-Processing Package (What it is?, Commonly Supported Features); Spreadsheet Package (What it is?, Commonly Supported Features); Graphics Package (What it is?, Commonly Supported Features); Personal Assistance Package (What it is?, Commonly Supported Features).

**The Internet :** Definition (What it is?); Brief History; It's Basic Services (Electronic Mail, File Transfer Protocol, Telnet. Usenet News, The  World Wide Web); WWW Browsers; Uses of the Internet.

**Classification of Computers :** Notebook Computers; Personal Computers (PCs); Workstations; Mainframe Systems; Supercomputers;  Clients and Servers.

## Section-III

### MICROSOFT OFFICE 2000

**Microsoft Office 2000 :** Introduction; Microsoft  Word  2000; Microsoft Excel 2000; Microsoft Access 2000; Microsoft Powerpoint 2000,  Microsoft Outlook 2000; Internet Explorer 5.0; Microsoft FrontPage 2000; Microsoft Publisher 2000; Microsoft PhotoDraw 2000; Microsoft Office Bar; Using the Mouse (To Click, To double-click, To select, To drag, To scroll, To choose  from a menu, To move a window, To resize a  window,  To minimize  a  window,  To restore a minimized window, To maximize a  window, To switch windows, To close a window, Remember); Microsoft Office 2000 and Web (Microsoft  Word 2000, Microsoft Excel 2000,  Microsoft Access 2000, Microsoft Powerpoint 2000,  Microsoft Outlook 2000, Microsoft FrontPage 2000); Common Keyboard Commands.

**Creating Your Document in Word 2000  :** Introduction; Saving the file; Formatting the text, Alignment of Text; Applying  Fonts; Spell Checking; Consulting Thesaurus; Assign

Character Styles (Assign a Character Style, Create a character style); Borders and Shading (Apply Borders and Shading); Closing of the File; Save as option; Open File (From File menu, From Open Icon); Printing Your Document.

**Proofing Your Document in Word 2000 :** Introduction; Editing Tools; AutoCorrect (Add AutoCorrect Entries Without Formatting, Add New AutoCorrect Entries with Formatting); Auto Text (Creating an AutoText Entry, AutoComplete Option); AutoFormat (AutoFormat as You Type, AutoFormat on Command, AutoFormatting Text); Find and Replace; Find; Replace Text; Page Numbering; Header and Footer (Adding a Header or Footer in Your Document); Footnotes and Endnotes (Add a Footnote or Endnote).

**Creating a Worksheet in Excel 2000 :** Introduction; Copying Formula.

**Advanced Techniques of Excel 2000 :** Introduction; Auditing a Workbook (To Trace the Precedents for a Formula); Comment Inserting (To Insert a Comment); Formulas That Make Decisions (How the If function works); Headers and Footers; Merging Workbooks (To merge workbooks); Outlines (Outline a Worksheet Automatically, Clear Entire Outline, Show or Hide Outline Symbols, Group Rows or Columns in an Outline, Ungroup Rows or Columns in an Outline, Remove Group from Outline, Set Outline Options); Printing Column and Row Labels on Every Page; Protecting a Workbook (To unlock cells so that others can edit the cell contents, To protect a workbook, To share a workbook); Ranges, Naming (To name a range); References (Absolute references, Mixed references); Seeking Goals (To seek a goal); Sheets Naming (To Name a Sheet); Working with Workbooks (Copying Entries Between Workbooks, Moving Sheets Between Workbooks, Deleting Sheets).

**Creating Presentation Using AutoContent Wizard, Creating New Presentation, Creating Presentation from Template, Changing views.**

| MSIT -102 | PROGRAMMING IN C |
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**INSTRUCTIONS FOR PAPER-SETTER**

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**INSTRUCTION FOR CANDIDATES**
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

**Section-I**

**Origin & Introduction to C** : About C, Evolution of C, Programming languages, Structure of a C program, Compiling a C program, Compiler & interpreters, Pseudocodes, Simple C program, Character set in C, Keywords in C, Hierarchy of operators, Basic data types, Qualifiers used with basic data types, Variables in C, Type declaration, Output function, Input function and format specifiers, arithmetic operators, Unary operators, Relational and logical operators, Constraints in C.

**Decision Making, Branching & looping:** Why control statements, The if statement, if else statement, for statement, while loop, do while statements, break statements, continue statements, switch statement, goto statement, ternary operators.

## Section-II

**Arrays & String Handling :** Introduction to arrays, advantages of arrays, types of arrays, array declaration, array initialization, accessing data from array, array inside the memory, multidimensional arrays, Character arrays, Array overflow, String Variables, Reading & writing strings, string handling functions.

**User Defined Functions :** Introduction to functions, advantages of functions, declaring a function, calling a function, variables, passing arguments to a function, nested functions, passing array to functions, recursion in functions, Call by value and Call by reference.

## Section-III

**Pointers :** Introduction to pointers, pointer variations, dynamic memory allocation, pointers and arrays, pointers to pointers, functions returning pointers, 2 dimensional arrays and pointers, array of pointers.

**Structures & Unions :** Structure definition, Structure initialization, arrays of structures, arrays within structures, structures & functions, Unions.

**File Management in C :** Defining & opening a file, closing a file, I/O operations on file, error handling during I/O operations, Random Access Files.

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MSIT -103 C++ & DATA STRUCTURES

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**INSTRUCTIONS FOR PAPER-SETTER**

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The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each section and Part B will carry 4 questions from each section.

**INSTRUCTION FOR CANDIDATES**
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

**Section-I**

**DATA TYPES, OPERATORS AND STATEMENTS :** Identifiers and Keywords, Constants (String constants, Numeric constants, Character constants), C++ Operators (Arithmetic operators, Assignment operators, Comparison and logical operators, Bitwise logical operator, Special operators), Type Conversion.

**WRITING A PROGRAM IN** C++ : Declaration of Variables, Statements, Simple C++ Programs, Features of iostream.h, Keyboard and screen I/O, Manipulator Functions, Predefined manipulators, Input and Output (I/O) Stream Flags.

**CONTROL STATEMENTS :** Conditional Expressions (if statement, if - e1se statement), switch Statement, Loop Statements( for loop, while loop, do-while loop), Breaking Control Statements(break statement, continue statement, goto statement).

**FUNCTIONS AND PROGRAM STRUCTURES :** Defining a Function, return Statement, Types of Functions, Actual and Formal Arguments, Local and Global Variables, *Default Arguments,* Multifunction Program, Storage Class Specifiers (Automatic variable, Register variable, Static variable, External variable), *Recursive Function, Preprocessors ( Simple macro definitions, Macro with parameters, Other Processing Techniques, Conditional Compilation),* Header Files, Standard Functions.

**ARRAYS :** Array Notation, Array Declaration, Array Initialization, Processing with Array, Arrays and Functions, Multidimensional Arrays, Character Array.

**POINTERS :** Pointer Declaration (Pointer operator, Address operator, Pointer expressions), Pointer Arithmetic, Pointers and Functions (Call by value, Call by reference, Pointers to functions, Passing a function to another function), Pointers and Arrays, Pointer and one dimensional array, Pointer and multidimensional array, Pointers and Strings, Array of Pointers, Pointers to Pointers.

**Section-II**

**CLASSES AND OBJECTS :** Structures and Classes, Declaration of Class, Member Functions, Defining the Object of a Class, Accessing a Member of Class, Array of Class Objects, Pointers and C]asses, Unions and Classes, Classes within Classes {Nested Class), Constructors (Copy constructors, Default constructors), Destructors, Inline Member Functions, Static Class Members (Static data member, Static member functions), Friend Functions, Dynamic Memory Allocations, this Pointer.

**INHERITANCE :** Single Inheritance, Types of Base Classes (Direct base classes, Indirect base classes), Types of Derivation (Public inheritance, Private inheritance, Protected inheritance), Ambiguity in Single Inheritance, Array of Class Objects and Single Inheritance, Multiple Inheritance (Array of class objects and multiple inheritance, Ambiguity in the multiple inheritance), Container Classes, Member Access Control (Accessing the public data, Accessing the private data, Accessing the protected data, Accessing private member by friend class).

**OVERLOADING :** Function Overloading (Function overloading with various data types, Function overloading with arguments, Scoping rules for function overloading, Special features of function 0verloading), Operator Overloading, Overloading assignment

operator, Overloading of Binary Operators, Overloading arithmetic operators, Overloading of comparison 0perators, Overloading of Unary Operators).

**POLYMORPHISM :** Polymorphism, Early Binding, Polymorphism with Pointers, Virtual Functions, *Late Binding,* Pure Virtual Functions, Abstract Base Classes, Constructors under Inheritance, Destructors under Inheritance, Virtual Destructors, Virtual Base class.

Section-III

**DATA FILE OPERATIONS :** Opening & closing of files (Opening a file, Closing a File), Stream State Member functions, reading/Writing a character from a file, Binary file operations, Classes & file operations, Array of class objects & file operations, Nested classes & file operations, Random Access File processing.

**IMPLEMENTING DATA STRUCTURES :** Linked Lists (Introduction, Traversing, Insertion, Updation & Deletion), Stacks (Introduction, Push, Pop), Queues (Introduction, Addition, deletion), Introduction to Trees, Binary Trees (Introduction, Traversal, Deletion, Addition).

| MSIT -104 | WEB TECHNOLOGIES |
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**INSTRUCTION FOR CANDIDATES**
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**Section-I**
**INTRODUCTION TO HTML :** Information Files Creation; Web Server; Web Client/Browser (Understanding how a Browser communicates with a Web Server); Hyper Text Markup Language (HTML) (HTML Tags, Paired Tags); Commonly used HTML Commands (The structure of an HTML program, Document Head, Document Body); Titles and Footers; Text Formatting (Paragraph Breaks, Line Breaks); Emphasizing Material in a Web Page (Heading Styles, Drawing Lines); Text Styles (Bold, Italics, Underline); Other Text Effects (Centering (Text, Images etc.); Spacing (Indenting Text).

**Lists :** Types of Lists (Unordered List (Bullets), Ordered Lists (Numbering), Definition Lists).

**Adding Graphics to HTML Documents :** Using the Border attribute; Using the Width and Height Attribute; Using the Align Attribute; Using the ALT Attribute.

**Tables :** Introduction (Header, Data rows, The Caption Tag); Using the Width and Border Attribute; Using the Cellpadding Attribute; Using the Cellspacing Attribute; Using the BGCOLOR Attribute; Using the COLSPAN and ROWSPAN Attributes.

**Linking Documents :** Links (External Document References, Internal Document References); Images as Hyperlinks (Image Maps).

**Frames :** Introduction to Frames (The <FRAMESET> tag, The <FRAME> tag, Targeting Named Frames.

 **Section-II**

**INTRODUCTION TO JAVASCRIPT :** JavaScript in Web Pages (Netscape and JavaScript, Database Connectivity, Client side JavaScript, Capturing User Input); The Advantages of JavaScript (An Interpreted Language, Embedded within HTML, Minimal Syntax - Easy to Learn, Quick Development, Designed for Simple, Small Programs, Performance, Procedural Capabilities, Designed for Programming User Events, Easy Debugging and Testing, Platform Independence/Architecture Neutral); Writing JavaScript into HTML; Building Up JavaScript Syntax; Basic Programming Techniques (Data Types and Literal, Type Casting, Creating Variables, Incorporating variables in a Script, The JavaScript Array, The Elements of an Array, The JavaScript Array and its length Property); Operators and Expressions in JavaScript (Arithmetic Operators, Logical Operators, Comparison Operators, String Operators, Assignment Operators, The Conditional Expression Ternary Operator, Special Operators); JavaScript Programming Constructs; Conditional Checking (If - then - else, Immediate If (Conditional expression); Super Controlled - Endless Loops (For Loop); Functions in JavaScript (Built-in Functions, User Defined functions, Declaring functions, Place of Declaration, Passing Parameters, Variable Scope, Return Values, Recursive Functions); Placing text in a Browser; Dialog Boxes (The Alert dialog box, The Prompt dialog box, The Confirm dialog box).

 **Section-III**

**The JavaScript Document Object Model :** Introduction (Instance, Hierarchy); The JavaScript Assisted Style Sheets DOM (JSSS DOM); Understanding Objects in HTML (Properties of HTML objects, Methods of HTML objects); Browser Objects (The Web Page HTML Object Hierarchy, Access to Elements of a Web Page, How a Web Page Element is Manipulated); Handling (WEB PAGE) Events Using JavaScript (Named JavaScript Event handlers).

**Forms Used by a Web Site :** The Form Object; The Form Object's Methods (The Text Element, The Password Element, The Button Element, The Submit (Button) Element, The Reset (Button) Element, The Checkbox Element, The Radio Element, The TextArea Element, The Select and Option Element, The Multi Choice Select Lists Element); Other Built-In Objects in JavaScript (The String Object, The Math Object, The Date Object);

User Defined Objects (Creating a User Defined Object, Instances, Objects within Objects).

**Cookies :** What are Cookies; Setting a Cookie.

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**MSIT -105 OPERATING SYSTEMS**

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**Section-I**

**History of Operating Systems :** Zeroeth Generation : Mechanical Parts; First Generation (1945-1955): Vaccum Tubes; Second Generation (1955 – 1965): Transistors; Third Generation (1965 – 1980) : Integrated Circuits; Fourth Generation (1980 – 1990) : Large Scale Integration.

**Computer Architecture :** Introduction; 4GL Program; 3GL (HLL) Program; 2GL (Assembly) Program; 1GL  (Machine Language) Program; 0GL (Hardware Level); The Context of a Program; Interrupts.

**Section-II**

**Operating System Functions :** What is an Operating System?; Different Services of Operating Systems; Uses of System Calls; The Issue of Portability; User's view of Operating Systems; Graphical User Interface (GUI); The Kernel; Booting.

**Information Management :** Introduction; The File System; Device Driver (DD).

**Process Management :** Introduction; What is a Process?; Evolution of Multi-Programming; Context Switching; Process States; Process States Transitions; Process Control Block (PCB); Suspend/Resume Operations; Process Scheduling; Multitasking.

**Inter-Process Communication  :** The Producer – Consumer Problems; Solutions; Classical IPC Problems.

**Section-III**

**Dead-locks :** Introduction; Graphical Representation of a Dead-lock; Deadlock pre-requisites; Deadlock Strategies.

**Memory Management :** Introduction; Single Contiguous Memory Management; Fixed Partition Memory Management; Variable Partitions; Non-Contiguous Allocation – General Concepts; Paging; Segmentation; Combined Systems; Virtual Memory Management Systems.

## MSIT-106 COMMUNICATION & SOFT SKILLS

**Essentials of Grammar:** Parts of Speech, Punctuation, Vocabulary Building, Phonetics

**Office Management :** Types of Correspondence, Receipt and Dispatch of Mail, Filing Systems, Classification of Mail. ,Role & Function of Correspondence, MIS, Managing Computer

**Letter & Resume Writing:** Types of Letters-Formal / Informal, Importance and Function, Drafting the Applications, Elements of Structure, Preparing the Resume, Do's & Don'ts of Resume, Helpful Hints

**Presentation Skills:** Importance of Presentation Skills, Capturing Data, Voice & Picture Integration, Guidelines to make Presentation Interesting, Body Language, Voice Modulation, Audience Awareness, Presentation Plan, Visual Aids, Forms of Layout, Styles of Presentation.

**Interview Preparation:** Types of Interview, Preparing for the Interviews, Attending the Interview, Interview Process, Employers Expectations, General Etiquette, Dressing Sense, Postures & Gestures

**Group Discussion & Presentation:** Definition, Process, Guidelines, Helpful Expressions, Evaluation


(Note: Every student shall be given 15 minutes. of presentation time & 45 minutes of discussion on his/ her presentation.)

**The student will be evaluated on the basis of :**

- his / her presentation style
- Feedback of Faculty & Students
- General Etiquette
- Proficiency in Letter Drafting / Interview Preparation
- The paper is internal and at least 3 tests will be taken. Best 2 of 3 shall account for final grades (70% Test & 30% Presentation)

# SEMESTER - 2

| MSIT -201 | COMPUTER NETWORKS |
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### Section-I

**DATA COMMUNICATIONS :** Multiplexing, Signaling,  Encoding & Decoding, Error Detection & Recovery, Flow Control, Sliding Window, Congestion Management.

**COMMUNICATION NETWORKS :** Introduction to networking, OSI Model for Networking, Internet, ATM, Network Components ( Cables, Hubs, Bridges, Switches, Routers), Network Topologies, Shared Medium, Peer to Peer, Hybrid Technology.

### Section-II

**NETWORK TECHNOLOGIES :**   Local Area Network Technologies, Ethernet Technologies, Ethernet Versions,  Token Ring Technologies,  Wide Area Network Technologies (Frame Relay, SMDS, ISDN, SONET, PPP, HDLC, LLC), Wireless Networks (Radio Frequencies, Microwave Frequencies, Infrared Waves.

**MULTIPLE ACCESS :** Design Issues, Distributed & Centralized Design, Circuit Mode & Packet Mode Design, Implementation Issues, Performance Considerations,  Base Technology (FDMA, TDMA, CDMA, Centralized Access, Circuit Mode Access, Poling or Packet Mode Access, Reservation Based Access), Distributed Access (decentralized polling, CSMA, CSMA/CA, CSMA/CD, Busy Tone Multiple Access & Multiple Acccess Collision Avoidance, Token Passing, ALOHA, Slotted ALOHA, Reservation ALOHA), Hardware Addressing

### Section-III

**SWITCHING :** Circuit Switching (Time Division switching, Space division switching, time space switching, time space time switching),  Packet Switching (Port Mappers, Blocking, ATM Switching, Switching Fabric (Crossbar, Broadcast, Switching Fabric Elements), Bridges (Transparent bridges, Spanning Tree Algorithm, Virtual LANS), Switches.

**NAMING & ADDRESSING :** Hierarchical Naming, Addressing, Telephone Networks, Internet, IPv4, Subnetting Ipv4 Networks, Private Networks, Asynchronous Transfer Mode, Name Resolution, Address Resolution Protocol (Arp), RARP

**ROUTING :** Routing Information, Routing Protocols, Hierarchical Routing, Multicast Routing.

**SERVICES & APPLICATIONS :** File transfer protocol, TFTP, Domain Name System, DHCP, SNMP, Electronic Mail, WWW, HTML, HTTP, RPC & Middleware.

**SECURITY :** Threats, Encryption/Decryption, Firewalls, IP Security, Web Security, E-Mail Security.

| MSIT -202 | RDBMS |
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**Section I**


**An Overview of DBMS and DB Systems Architecture :** Introduction to Database Management systems; Data Models; Database System Architecture; Relational Database Management systems; Candidate Key and Primary Key in a Relation; Foreign Keys; Relational Operators; Set Operations on Relations; Attribute domains and their Implementation.

**The Normalization Process :** Introduction; first Normal Form; data Anomalies in INF Relations; Partial Dependencies; Second Normal Form; data Anomalies in 2NF Relations; Transitive Dependencies; Third Normal Form; data Anomalies in 3NF Relations;

**The Entity Relation Ship Model :** The Entity Relationship Model; Entities and Attributes; Relationships; One-One Relationships; Many-to-one Relationships; Normalizing the Model; Table instance charts.

**Section-II**

**Interactive SQL :** SQL commands ; Data Definition Language Commands; Data Manipulation Language Commands; The Data types a cell can hold; insertion of data into the tables; Viewing of data into the tables; Deletion operations; updating the contents of the table; modifying the structure of the table; renaming table; destroying tables; Data Constraints; Type of Data Constraint; Column Level Constraint; Table Level Constraint; Null value Concepts; The UNIQUE Constraint; The PRIMARY constraint; The FOREIGN key constraint; The CHECK Constraint; Viewing the User Constraints

**Viewing The Data :** Computations on Table Data; Arithmetic Operators; Logical Operators;  Comparison Operators; Range Searching; Pattern Searching; ORACLE FUNCTIONS; Number Functions; Group Functions; Scalar Functions; Data Conversion Functions;  Manipulating Dates in SQl ; Character Functions;

**Sub queries and Joins :** Joins; Equi Joins; Non Equi Joins; Self Joins; Outer Joins; SubQueries; Correlated Queries; Using Set Operators:- Union , Intersect; Minus ;

**Views and Indexes :** Definition and Advantages Views; Creating and Altering Views; Using Views; Indexed Views; Partitioned views; Definition and Advantages of Indexes; Composite Index and Unique Indexes; Accessing Data With and without Indexes; Creating Indexes and Statistics.

**Section-III**

**Introduction to PL/SQL :** Advantage of PL/SQL; The Generic PL/SQL Block; The Declaration Section; The Begin Section; The End Scction; The Character set; Literals; PL/SQL Data types; Variables; Constants; Logical Comparision; Conditional Control inPL/SQL; Iterative Control;

**Advanced PL/SQL :** Types of Cursors; Implicit Cursor; Explicit Cursor; Explicit Cursor attributes; Cursor For Loop; Parameterized Cursor; Error Handling in PL/sql;Internal Exceptions; User Defined Exceptions

**Database Objects :** Sequences, Creating Sequences; Referencing Sequences; altering a Sequence; Dropping a Sequence, Stored Procedures and Functions:- Advantages of using a Procedure or Function; Procedure Versus Functions; Creating stored Procedures and Functions; Parameters to Procedures and Functions; Deleting a Stored Procedure or a Functions; Packages:- Components of a Package; Package Objects; Private and Public ; Package state; Package Dependency; Triggers:- Use of Database Triggers; Database Triggers V/s Procedures; Database Triggers V/S Integrity constraints; RAISE_APPLICATION_ERROR PROCEDURE; Types of Triggers:- Row Triggers, statement Triggers; Before V/S After Triggers; Deleting a Trigger;

**Object Types and Varrying Arrays :**User Defined Data Types, Creating a Type, Varrying Array, Creating and Using a Varrying array, Nested Tables.

**Objects/Basic Database Administration :** Basic Data Base Administration; Creating User; Using Tables in Another schema; Creating roles for Applications; Granting and Revoking previliges;System and Object Priviliges;

| MSIT -203 | SOFTWARE ENGINEERING AND PROJECT MANAGEMENT |
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**INSTRUCTIONS FOR PAPER-SETTER**

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**INSTRUCTION FOR CANDIDATES**
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## Section-I

**Introduction   :** The Software Problem (Software is Expensive, Late, Costly and Unreliable, Problem of Change and  Rework); Software Engineering Problem (The Problem of Scale, Cost, Schedule and Quality, The Problem of Consistency); The Software Engineering Approach (Phased Development Process, Project Management and Metrics).

**Software Processes :** Software Process (Processes, Projects, and Products, Component  Software Processes); Characteristics of a  Software Process (Predictability, Support Testability and Maintainability, Early Defect  Removal and Defect Prevention, Process Improvement); Software Development Process (A Process Step Specification, Waterfall Model, Iterative Enhancement, The Spiral Model); Project Management Process (Phases of Management Process, Metrics, Measurement and Models); Software  Configuration Management Process (Configuration Identification, Change Control, Status Accounting and Auditing); Process Management Process (Building Estimation Models, Process Improvement and Maturity).

**Software Requirements Analysis and Specification :** Software Requirements (Need for SRS, Requirement Process); Problem Analysis (Analysis Issues, Informal Approach, Structured Analysis, Object-Oriented Modeling, Other Modeling Approaches, Prototyping, Requirement Specification (Characteristics of an SRS, Components of an SRS, Specification Languages, Structure of a  Requirement Document); Validation (Requirement Reviews, Other Methods); Metrics (Size Measures, Quality Metrics).

## Section-II

**Planning a Software Project :** Cost Estimation (Uncertainties in Cost Estimation, Building Cost Estimation Models, On Size Estimation, COCOMO Model, An Example); Project Scheduling  (Average Duration Estimation, Project  Scheduling and Milestones, Example Continued); Staffing and Personnel Planning (Rayleigh Curve, Personnel Plan, Example  Continued, Team Structure); Software Configuration Management Plans;

Quality Assurance Plans (Verification and Validation (V&V), Inspections and Reviews); Project Monitoring Plans (Time Sheets, Reviews, Cost-Schedule-Milestone Graph, Earned Value Method, Unit Development Folder); Risk Management (Risk Management Overview, Risk Assessment, Risk Control).

**Function-Oriented Design :** Design Principles (Problem Partitioning and Hierarchy, Abstraction, Modularity, Top-Down and Bottom-Up Strategies); Module-Level Concepts (Coupling, Cohesion); Design Notation and Specification (Structure Charts, Specification); Structured Design Methodology (Restate the Problem as a Data Flow Diagram, Identify the Most Abstract Input and Output Data Elements, First-Level Factoring, Factoring the Input, Output, and Transform Branches, Design Heuristics, Transaction Analysis, Discussion); Verification (Design Reviews, Automated Cross-Checking); Metrics (Network Metrics, Stability Metrics, Information Flow Metrics).

**Detailed Design :** Module Specifications (Specifying Functional Modules, Specifying Classes); Detailed Design (PDL, Logic/Algorithm Design, State Modeling of Classes), Verification (Design Walkthroughs, Critical Design Review, Consistency Checkers); Metrics (Cyclomatic Complexity, Data Bindings, Cohesion Metric).

**Section-III**

**Coding :** Programming Practice (Top-Down and Bottom-Up, Structured Programming, Information Hiding, Programming Style, Internal Documentation, Law of Demeter for OO Programs); Verification (Code Reading, Static Analysis, Symbolic Execution, Proving Correctness, Code Inspections or Reviews, Unit Testing); Metrics (Size Measures, Complexity Metrics, Style Metrics).

**Testing :** Testing Fundamentals (Error, Fault and Failure, Test Oracles, Top-Down and Bottom-Up Approaches, Test Cases and Test Criteria, Psychology of Testing); Functional Testing (Equivalence Class Partitioning, Boundary Value Analysis, Cause-Effect Graphing, Special Cases); Structural Testing (Control Flow – Based Criteria, Data Flow – Based Testing, An Example, Mutation Testing, Test Case Generation and Tool Support); Testing Object-Oriented Programs (Issues in Testing Classes, State-Based Testing, Incremental Testing for Subclasses); Testing Process (Comparison of Different Techniques, Levels of Testing, Test Plan, Test Case Specifications, Test Case Execution and Analysis);

| MSIT -204 | VISUAL BASIC PROGRAMMING |
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**INSTRUCTIONS FOR PAPER-SETTER**

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**INSTRUCTION FOR CANDIDATES**
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## Section-I

**Introduction to Visual Basic :** The Visual Basic Program Development Process; The Visual Basic Environment; Opening a Visual Basic Project; Saving a Visual Basic Project; Running a Visual Basic Project;

**Visual Basic Fundamentals :** Numeric Constants; String Constants; Variables; Data Types and Data Declarations; Operators and Expressions; Hierarchy of Operations; String Expressions; Library functions , Branching and Looping Statements, Relational Operators and Logical Expressions; Logical Operators; Branching with the if-Then Block; Branching with if-Then -Else Blocks; Selection: Select-case; Looping with for-Next; Looping With Do-Loop; Looping with While-Wend

**Visual Basic Control Fundamentals :** Visual Basic Control Tools; Control tool Categories; Working with controls; Naming Forms and Controls; Assigning Property Values to Forms and Controls; Executing Commands(Event Procedures and Command Buttons); Display Output Data (Labels and Text Boxes);Entering Input data(Text Boxes); selecting Multiple Features(Check Boxes); selecting Exclusive Alternatives(Option Button and Frames);Assigning Properties Collectively(The With Block); Generating Error Messages(The MsgBox Function);Creating Times Events; Scrollbars;

## Section-II
**Menus and Dialog Boxes :** Building Drop-down Menus; accessing a Menu from the Keyboard; Menu Enhancements; Submenus; Pop-up Menus; Dialog Boxes; Input Box;

**Executing and Debugging a New Project :** Syntax Errors; Logical Errors; Setting break Points; Defining Watch Values; Stepping Through a Program; User- Induced Errors; Error Handlers;

**Procedures :** Modules and Procedures; Sub Procedure; Event Procedures; Function Procedures;  Scope; Optional Arguments

**Arrays :** Array Characteristics; Array declarations; Processing Array Elements;  Passing Arrays to Procedures; Dynamic Arrays; Array-Related Functions; Control Arrays;

## Section-III

**Using Class Modules :** Object Oriented Principles; Creating Class Modules; Using Class Modules Adding Properties and Events and Methods.

**Using COM Components :** Introduction to ActiveX Components  and Component Object  Model; Benefits of COM; Clients and Servers; Types of ActiveX Components Available in  Visual Basic; Creating user defines ActiveX Components; Managing

Components; The Visual Component Manager; Registering and UnRegistering Components.

**ActiveX Controls :** Creating an ActiveX Control; Benefits of ActiveX Control; Adding Properties; Methods and Events to the Control; Managing and Distribution of the Control; Built-in Active X Controls.

**ActiveX EXE and ActiveX DLL :** Introduction to ActiveX DLL and EXE; Creating ActiveX EXE Component; Creating ActiveX DLL Component

**Data Access using ADO :** Data Access Technology with VB ; The ActiveX Data Object Model; Advantages of ADO and OLEDB; Connecting to a Data Source; Retrieving from a Data Source; Sorting and Searching Data; Updating Data; Creating Dynamic Record Sets; Using Cursors; Cursor Types; Locking; Accessing ADO Data Control.

**Data Environment and Data Report :** Introduction; Data Environment Designers; Working with Data Reports; Cut different types of Data Reports.

**SEMSTER III**

| MSIT-301 | C# WITH .NET |
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**INSTRUCTIONS FOR PAPER-SETTER**

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**Section – A**

**Introduction:** What is C#, Why C#,, Evolution of C#, Chracteristics of C#, Applications of C#, How does C# differs from C++, How does C# differs from Java.

**Overview of C# :** Namespaces, Adding comments, Main returning a value, Using aliases for Namespace classes, Passing String objects to WriteLine method, Command line arguments, Main with a Class, Providing interactive input, Using mathematical functions, multiple main methods, compile time errors, program structure, program coding style.

**Literals, Variables & Data Types :** Literals, variables, data types, value types, reference types, declaration of variables, initialization of variables, default values, constant variables, boxing & unboxing.

**Operators and Expressions :** Introduction; Arithmetic Operators; Relational Operators; Logical Operators; Assignment Operators; Increment and Decrement Operators; Conditional Operator; Bitwise Operators; Special Operators; Arithmetic Expressions; Evaluation of Expressions; Precedence of Arithmetic Operators; Type Conversions; Operator Precedence and Associativity; Mathematical Functions.

**Decision Making and Branching :** Introduction; Decision Making with if Statement; Simple if Statement; The if…else Statement; Nesting of if …..else Statements; The else if Ladder; The Switch Statement; The ? : Operator.

**Decision Making and Looping :** Introduction; The while Statement; The do Statement; The for Statement; The foreach Statement; Jumps in Loops.

**Section-II**

**Methods in C # :** Introduction; Declaring Methods; The Main Method; Invoking Methods; Nesting of Methods; Method Parameters; Pass by Value; Pass by Reference; The Output Parameters; Variable Argument Lists; Methods Overloading.

**Handling Arrays :** Introduction; One-Dimentional Arrays; Creating an Array; Two-Dimentional Arrays; Variable-Size Arrays; The System.Array Class; ArrayList Class.

**Manipulating Strings :** Introduction; Creating Strings; String Methods; Inserting Strings Using System; Comparing Strings; Finding Substrings; Mutable Strings; Arrays of Strings; Regular Expressions.

**Structures and Enumerations :** Introduction; Structures; Structs with Methods; Nested Structs; Difference between Classes and Structs; Enumerations; Enumerator Initialization; Enumerator Base Types; Enumerator Type Conversion.

**Section-III**
**Classes and Objects :** Introduction; Basic Principles of OOP; Defining a Class; Adding Variables; Adding Methods; Member Access Modifiers; Creating Objects; Accessing Class Members; Constructors; Overloaded Constructors; Static Members; Static Constructors; Private Constructors; Copy Constructors; Destructors; Member Initialization; The this Reference; Nesting of Classes; Constant Members; Read-only Members; Properties; Indexers.

**Inheritance and Polymorphism :** Introduction; Classical Inheritance; Containment Inheritance; Defining a Subclass; Visibility Control; Defining Subclass Constructors; Multilevel Inheritance; Hierarchical Inheritance; Overriding Methods; Hiding Methods; Abstract Classes; Abstract Methods; Sealed Classes: Preventing Inheritance; Sealed Methods; Polymorphism.

**Interfaces : Multiple Inheritance :**
ntroduction; Defining an Interface; Extending an Interface; Implementing Interfaces; Interfaces and Inheritance; Explicit Interface Implementation; Abstract Class and Interfaces.

**Operator Overloading :** Introduction; Overloadable Operators; Need for Operator Overloading; Defining Operator Overloading; Overloading Unary Operators; Overloading Binary Operators; Overloading Comparison Operators.

**Delegates and Events :** Introduction; Delegates; Delegate Declaration; Delegate Methods; Delegate Instantiation; Delegate Invocation; Using Delegates; Multicast Delegates; Events.

**Managing Console I/O Operations :** Introduction; The Console Class; Console Input; Console Output; Formatted Output; Numeric Formatting; Standard Numeric Format; Custom Numeric Format.

**Managing Errors and Exceptions:** Introduction; Types of Errors; Exceptions; Syntax of Exception Handling Code; Multiple Catch Statements; The Exception Hierarchy; General Catch Handler; Using finally Statement; Nested Try Blocks; Throwing Our Own Exceptions; Checked and Unchecked Operators; Using Exceptions For Debugging.

| MSIT-302 | OPERATING SYSTEM ADMINISTRATION WITH WINDOWS 2000 |
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**INSTRUCTIONS FOR PAPER-SETTER**

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**Section-I**

**Evaluating Windows 2000 Professional  :** Understating the Windows 2000 Family, windows 2000 Professional, Windows 2000 Server, Windows 2000 Advanced Server, Windows 2000 Data Center, Comparing Windows 2000 Professional with Other Windows Operating Systems, Windows 2000 Professional versus Windows 3.1, Windows 2000 Professional versus Windows 95/98, Windows 2000 Professional versus Windows NT Workstation 4, Networking and Windows 2000 Professional

**Installing and Upgrading to Windows 2000 Professional :** Windows 2000 Professional Hardware Requirements, Checking Your Hardware Compatibility, Collecting Network Information, Making a Backup, Should You Upgrade or make a New Installation ?, Running Setup, Performing a New Installation, Upgrading to Windows 2000 Professional, Choosing a File System, NTFS, FAT and FAT32, A Quick Look at Disk Partitions, Setting up a Dual-Boot Configuration, Installing the Add-on Components, Creating a New User Account

**Exploring the Desktop :** Logging On, Using the Start Menu, Clicking Start, Right Clicking Start, Working with the Taskbar, The Quick Launch Toolbar, The Rest of the Taskbar, Hiding and Displaying the Taskbar, Using the Icons on the Desktop, My Documents, My Computer, My Network Places, Recycle Bin, Internet Explorer, Connect to the Internet, Creating Shortcuts

**Managing Files and Folders :**  Using Explorer, Opening Files and Folders, Creating a Folder, Creating a File, Sharing Files and Folders, Copying and Moving Files and Folders, Renaming Files and Folders, Deleting Files and Folders, Finding Files and Folders, Keeping Files Current with Synchronization Manager, Understanding and Using Folder Options, Handling Floppy Disks, Formatting a Floppy Disk, Copying a Floppy Disk

**Section-II**

**Customizing Your Desktop :** Opening Control Panel, Setting Up the Active Desktop, Making Windows 2000 Professional More Accessible, Specifying Accessibility Options, Using the Accessibility Accessories, Customizing the keyboard, Adjusting Your Mouse, Changing the Display, Customizing the Desktop Background, Choosing the Display, Choosing a Screen Saver, Adjusting the Power Settings, Changing the Appearance of Windows Elements, Enablilng Web Content on Your Desktop, Changing Desktop Icons and Effects, Modifying the Display of Colors and Resolution, Establishing Your Regional Settings, Adjusting the Date and Time, Personalizing the Start Menu

**Setting Object Properties :** Right-Clicking in Windows 2000 Professional, Using Properties Dialog Boxes, Changing File Properties, Compressing and Encrypting Files with NTFS, Changing Folder Properties, My Computer Properties Setting

**Installing and Running Your Applications :** Running Programs from the Start Menu, Running Programs from Explorer, Running Programs from Search, Running Programs from a Document, Starting Programs Automatically When you Start, Windows 2000 Professional, Running Programs Minimized, Using the Run Command, Working from the Command Prompt, Adding and Removing Programs, Adding New Programs, Changing or Removing Programs, Adding and Removing Windows Components, Looking at the Registry, Scheduling Tasks, Adding a New Scheduled Task, Modifying an Existing Scheduled Task, Using the Advanced Menu

**Printers and Printing :** Adding Printers, Installling a Local Printer, Installing a Network Printer, Printing Documents, Printing form the Desktop, Printing from an Application, Printing to a File, Managing the Printing Process, Customizing the Printer's Properties, The General Tab, The General Tab, The Ports Tab, The Advanced Tab, The Services Tab, The Device Settings Tab, The SecurityTab, The Color Management Tab, Understanding Fonts

**Section-III**

**Windows 2000 with ADS :** How Networks Develop, The General Goals of ADS, Enterprise Management, An Industry Standard, Vendor Acceptance, User Acceptance, Single Namespace, Namespace, Active Directory Names, Active Directory in the Windows 2000 Server Architecture, The Security Subsystem, The Directory Service Module, The Internal Architcturre of the Active Directory Module

**Creating and Managing User Accounts :** Use Computer Management for Local Accounts, Use Active Directory User And Computers for Domain Accounts, Where Do User and Group Accounts Live ?, Security Identifiers, Quick Tour of User and Group-Related Functions in Active Directory Users and Computers, Prebuilt Accounts: Administrator and Guest, Creating a New User Account, User Account Properties, Managing Accounts, Understanding Groups, Creating Groups, Group Types: Security Groups versus Distribution Groups, Group

Scope: Locals, Globals and Universals, Working with Security Groups, User Rights, How do Organizational Units Fit in Here ? Working with Group Policies, Group Policy Concepts, Local Policies and Group Policy Objects, Creating Group Policies, Filtering Group Policy, Delegating Group Policy Administration, User and Computer Configuration Settings, Managing Group Policies

| MSIT-303 | ADVANCED WEB DEVELOPMENT |
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**Section I**

**Getting Started with Active Server Pages :-** What are Active Server Pages ? (Understanding the Client Server Model, How ASP differs from Client-Side Scripting Technologies); Running ASP Pages (Setting Up Personal Web Server, Setting Up Internet Information Server, Using ASP without IIS or PWS); Creating You First ASP Pages.

**Dissecting You First ASP Script :-** Understanding ASP Scripts (What Does Response.Write Do ?, The <%=Shortcut, What's with the <%@ LANGUAGE=VBSCRIPT%>?, Writing ASP Code Without Using <%…%>, Comments, Line Continuation Character); What You ASP Script Returned to the Browser; The ASP Process.

**Working with Variables :-** What is a Variable?; Data Types; Integer; Floating-Point Numbers (String, Date, Boolean, Currency, Object, What Are Variant Variables?. What Does It Mean to Declare a Variable?, Why Use Explicit Declarations in VBScript?, How Do You Name a Variable?, Constants, Arrays, How Do You Determine Your Variable's Type?); VB Script Operators (Assignment Operators, Mathematical Operators, Subtraction, Multiplication , Division, Integer Division, Modulus, Exponentiation, Negation Concatenation, Comparison Operators, Logical Operators).

**Understanding VBScript Control Structures :-** What Is a Control Structures; Types of Controls (Conditional Logic, Looping Logic, Branching Logic); Control Structure

Examples (Conditional Logic  Controls, Looping Logic Controls, Branching Logic Controls).

**Using VBScript's Built-In Functions :-**  Typecasting Variables (What is Typecasting and Why Should I Typecast?, How to Typecast Your Variables); Formatting  Functions; Math Functions; Date Functions (Working with Date Values, Breaking Down Date Values); String Functions; Other Functions.

**Section-II**

**Working with Objects :-** What are objects?;  The Building  Blocks of Objects (Properties, Methods, Instances of Objects); Built-in ASP Objects (Response  Objects, Request Object, Application  Object, Session Object, Server Object, ObjectContext Object,  ASPError Object); Collections; Working with Objects; Events.

**Using the Response  Object :-** What is the Response Object; Dissecting the Response Object (Sending  HTML to the Browser, Buffering ASP Pages, Sending  the User to Another Page, Cookies, Caching Your  ASP Pages).

**Communicating with the User :-** Receiving Information from the User (What are Forms?, Creating Forms, Designing Forms, Submitting Forms, Reading Form Values from an ASP Page); Using Advanced Form Techniques (Revisiting the ACTION Property, Client-Side Form Validation); Using the Different Form Fields (Text Boxes, List Boxes, Check Boxes, Radio Buttons, Choosing  your  Checkboxes and Radio Buttons).

**Collecting the Form Information :-** Retrieving the Results of a Form (Using  the Request Object); Using the Querystring to Send Information,

**Working with the Request Object :-** Accessing the HTTP Headers (Useful HTTP Headers, Reading the HTTP Headers with Request. ServerVariables); Accessing the Environment Variables (Useful Environment Variables, Reading the Environment Variables Using Request. ServerVariables); Using Cookies (What are Cookies?, How to Read  Cookies Using the Request  Object, How to Write  Cookies Using the Response Object, Advantages and Disadvantages of Using Cookies.

**Maintaining Persistent Information on the Web :-** It's a Fact: The  Web Is Stateless (Ways to Maintain State); The Session Object (Using Session Variables, Pitfalls of Session Variables, Session Variables Without Cookies); The Application Object (Using Application Variables, Pitfalls of Application Variables); Initializing Application and Session Variables (Creating a  Global. asa File).

**Debugging You ASP scripts and Handling Errors :-**  Debugging Your ASP Scripts (Debugging Fatal Bugs, Debugging Nonfatal Bugs); Handling ASP Errors Gracefully (Using the Err  Object, Using the ASPError Object); Handling Non-ASP Errors Gracefully.

**Section-III**

**Using Databases :-** What Are Relational Databases ?(Common Relational Databases); Why Use Databases  ?; Working with Databases Using  ASP.

**Reading from a Database Using ASP :-** Databases and ASP (Communicating with a Database Using ActiveX Data Objects (ADO)); Connecting to a Database (The Connection Object, Using a System DSN, Using a DSN-less Connection, Opening the Connection, Closing the Connection, Properties of the Connection); Reading Data from a Database (The Recordset Object, Using adovbs.inc, Reading and Displaying the Contents of a Database Table).

**Inserting, Updating, and Deleting Database Records :-** Inserting Records (Lock Types, AddNew and Update); Updating Records; Deleting Records.

**Examining the Recordset Object :-** Enhancing Information Retrieval (Using the Fields Collection); Understanding the CursorType and CursorLocation Properties; Sorting Recordsets; Filtering Recordsets (Filtering Recordsets Bases on User Input).

**Using SQL Statements to Query Data :-** What is SQL ? (Executing SQL Statements Using ASP and ADO); The SELECT SQL Statement (Using the WHERE Clause, Iterating Through Recordsets Generated by SQL Statements); Allowing Users to Query Data.

**XML Basics :** The History Of XML;The Origins Of XML; Comparison Of XML And Html Components Of XML;

**Anatomy Of An XML Document :** A Sample XML Document,; XML Declaration; The Root Element ; An Empty Element; Attributes, Markup Delimiters; Element Mark Up; Attribute Mark Up; Naming Rules; Character References; Predefined Entities; Entity References; Cdata Sections; Processing Instructions.

**Creating Welformed And Valid Documents :** XML And Structured Information ; Document Type Declaration ; Welformed And Valid Document; DTD And Validation ;Internal DTD Subset ;External DTD; Developing The DTD ; Elements And Attributes Of DTDs; More About Elements ; Empty Element ; Element-Only Element; Mixed Elements; Any Element. ;More About Attributes; String Attributes; Enumerated Attributes; Tokenised Attributes; Creating A Valid Document From A DTD;

**Styling XML With CSS :** Cascading Style Sheet, XML , CSS And Web Browsers.; Specifying CSS Properties; Classes; Id Attributes; Embedding CSS In XML

**Rendering XML With XSL :** Comparing XSL And CSS; Template Rules; The Default Template Rules; Formatting Objects; Layout Formatting Objects And Content Formatting Objects; Exploring XSL Style Sheets ; Xslt Template Constructs

| MSIT-304 | WAP and WML |
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**INSTRUCTIONS FOR PAPER-SETTER**

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**Section-I**

**INTRODUCING WAP**  :- What is WAP, Importance & Benefits of WAP, History of WAP, WAP Architecture, WAP Services, Why WAP, Future of WAP.

**BASICS OF A GOOD WAP APPLICATION**  :- WAP Micro browsers, Generic WML Interface, Application design process, common design mistakes.

**THE USER INTERFACE**  :- User interface basics, Low bandwidth, Small Screen size, Text Entry, Using the Cache, Types of WML cards, The Back button.

**WAP DEVELOPMENT TOOLS & SOFTWARE**  Editors & emulators, Software Developer Kits and Integrated Development Environments, Converting Images, Specification of Well defined WBMP types.

**Section-II**

**WORKING WITH WML**  :- ML Basics, WAP & the Web, writing WML code, The document prologue, the Deck header, The First Card, the Second Card, The Deck Footer, Using Multiple decks, Graphics, Crating Links, Templates.

**INTERACTIVITY : FORMS & USER INPUT**  :- The Options Menu, Selection on the Nokia, Selection on Phone.com, Option Groups, Templates, the Do Element, Events, Orienterbackward, Orienterforward, Onpick, Ontimer, Variables, The Input Tag, Data Formatting.

**ADDING FUNCTIONALITY WITH WMLScript**  :- What is WMLScript, The rules of WMLScript, Variables, Operators, Control Constructs, Reserve Words, Functions, The Standard Libraries, Arrays, Pragmas, General coding principles.

**Section-III**

**DATABASE DRIVEN WAP**  :- Active Server Pages, ASP & WAP, The ASP Object Model, Activex Objects, Physically Connecting To Database, Querying The Database, Using The Returned Data, Tidying Up.

| MSIT-305 | CORE JAVA PROGRAMMING |
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**Section-I**

**FUNDAMENTALS OF OBJECT–ORIENTED PROGRAMMING** :- Introduction; Object-Oriented Paradigm; Basic Concepts of Object-Oriented Programming (Objects and Classes, Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic binding, Message communication); Benefits of OOP; Applications of OOP.

**JAVA EVOLUTION** :- Java History; Java Features (Compiled and interpreted, Platform-independent and portable, Object-oriented, Robust and secure, Distributed, Simple, small and familiar, Multithreaded and interactive, High performance, Dynamic and extensible); How Java Differs from C and C++ (Java and C, Java and C++); Java and Internet, Java and World Wide Web, Web Browsers (Hot Java, Netscape Navigator, Internet Explorer); Hardware and Software Requirements; Java Support Systems, Java Environment (Java development kit, Java standard library).

**OVERVIEW OF JAVA LANGUAGE** :- Introduction; Simple Java Program (Class declaration, Opening brace, The main line, The output line); More of Java (Use of math functions, Comments); An application with Two Classes; Java Program Structure (Documentation section, Package statement, Import statements, Interface statements, Class definitions, Main method class); Java Tokens (Java character set, Keywords, Identifiers, Literals, Operators, Separators); Java Statements; Implementing a Java Program (Creating the program, Compiling the program, Running the program, Machine neutral); Java Virtual Machine; Command Line Arguments; Programming Style.
**CONSTANTS, VARIABLES AND DATA TYPES** :- Introduction; Constants (Integer constants, Real constants, Single character constants, String constants, Backlash character constants); Variables; Data Types (Integer types, Floating point type, Character type, Boolean type); Declaration of Variables; Giving Values to Variables (Assignment statement, Read statement); Scope of Variable; Symbolic Constants (Modifiability, Understandability); Type Casting (Automatic conversion); Getting Values of Variables; Standard Default Values.

**OPERATORS AND EXPRESSIONS** :- Introduction; Arithmetic Operators (Integer arithmetic , Real arithmetic, Mixed-mode arithmetic); Relational Operators; Logical Operators; Assignment Operators; Increment and Decrement Operators; Conditional Operators; Bit-wise Operators; Special Operators (instance of operator, Dot operator); Arithmetic Expressions; Evaluation of Expressions; Precedence of Arithmetic Operator; Type Conversions in Expressions (Automatic type conversion, Casting a value); Operator Precedence and Associativity; Mathematical Functions.

**Section-II**

**DECISION MAKING AND BRANCHING** :- Introduction; Decision Making with if Statement; Simple if Statement; The if…..else Statement; Nesting of if…..else Statements; The else if Ladder; The switch statement; The ?: Operator.

**DECISION MAKING AND LOOPING** :- Introduction; The while Statement; The do Statement; The for Statement (Additional features of for loop, Nesting of for loops); Jumps in Loops (Jumping out of a loop, Skipping a part of a loop); Labeled Loops.

**CLASSES, OBJECTS AND METHODS** :- Introduction; Defining a Class; Adding Variables; Adding Variables; Adding Methods; Creating Objects; Accessing Class Members; Constructors; Methods Overloading; Static Members; Nesting of Methods; Inheritance: Extending a Class (Defining a subclass, Subclass constructor, Multilevel inheritance, Hierarchical inheritance); Overriding Methods; Final Variables and Methods; Final Classes; Finalizer Methods; Abstract Methods and Classes; Visibility Control (public access, friendly access, protected access, private access, private protected access, Rules of Thumb).

**ARRAYS , STRINGS AND VECTORS** :- Arrays; One-Dimensional Arrays; Creating an Array (Declaration of arrays, Creation of arrays, Initialization of arrays, Array length); Two-Dimensional Arrays (Variable size arrays); Strings (String arrays, String methods, StringBuffer class); Vectors; Wrapper Classes.

**INTERFACES**: Introduction; Defining Interfaces; Extending Interfaces; Implementing Interfaces; Accessing Interface Variables.

**PACKAGES:** Introduction; System Packages; Using System Packages; Naming Conventions; Creating Packages; Accessing a Package; Using a Package; Adding a Class to a Package; Hiding Classes.

**Section-III**

**MANAGING ERRORS AND EXCEPTIONS** :- Introduction; Types of Errors (Compile-time error, Run-time error); Exceptions; Syntax of Exception Handling Code; Multiple Catch Statements; Using finally Statement; Throwing Our Own Exceptions; Using Exceptions for Debugging.

**APPLET PROGRAMMING** :- Introduction; How Applets Differ from Applications; Preparing to Write Applets; Building Applet Code; Applet Life Cycle (Initialization state, Running State, Idle or stopped state, Dead state, Display state); Creating an Executable Applet; Designing a Web Page (Comment Section, Head Section, Body Section); Applet Tag; Adding Applet to HTML File; Running the Applet; More About Applet Tag; Passing Parameters to Applets; Aligning the Display; More about HTML Tags; Displaying Numerical Values; Getting Input from the User (Program analysis).

**GRAPHICS PROGRAMMING** :- Introduction; The Graphics Class; Lines and Rectangles; Circles and Ellipses; Drawing Arcs; Drawing Polygons; Line Graphs; Using Control Loops in Applets; Drawing Bar Charts.

## SEMESTER : 4

**MSIT-401 LINUX ADMINSTRATION**

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## INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions (80-120 words) of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each section and Part B will carry 4 questions from each section.

## INSTRUCTION FOR CANDIDATES
Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

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### Section-I

**INSTALLING LINUX AS A SERVER :** Linux and Linux Distributions ;Major differences between Windows 2000 and Linux; Single Users vs Multiusers vs Network Users; Separation of the GUI and the Kernel; Domains; Active Directory

**INSTALLING LINUX IN A SERVER CONFIGUARTION :** Before Installation; Hardware; Server Design ; Dual-Booting Issues; Methods of Installation; Installing Red Hat Linux; Creating a Boot Disk; Starting the Installation; Welcome of Red Hat Linux

**GNOME AND KDE :** The History of X Windows; The Downside; Enter KDE and GNOME; About KDE ; Licensing issues; Starting X Windows and KDE; KDE Basics; The KDE Control Center; About GNOME ; Starting X Windows and GNOME; GNOME Basics; The GNOME Configuration Tool.

### Section-II


**INSTALLING SOFTWARE :** The Red Hat Package Manager; Installing a New Package; Querying a Package; Uninstalling a Package; gnorpm; Compiling Software; Getting and Unpacking the Package; Looking for Documentation ;Configuring the Package; Compiling Your Package; Installing the Package

**MANAGING USERS:** Home Directories ;Passwords; Shells; Stratup Scripts; Mail; User Databases; The / etc /passwd File; The / etc / shadow File;
The / etc /group File; User Management Tools; Command-Line User Management; User LinuxConf to Manipulate Users and Groups; SetUID and SetGID Programs

**THE COMMAND LINE :** An Introduction to BASH; Job Control; Environment Variables; Pipes; Redirection; Command-Line Shortcuts; Documentation Tools;
The man Command; the text info System; File Listings; Owner ships and permissions; Listing Files; File and Directory Types; Change Ownership ;Change Group; Change Mode ; File Management and Manipulstion; Process Manipulation; Miscellaneous Tools;

## Section-III

**BOOTING AND SHUTTING DOWN :** LILO ;Configuring LILO; Additional LILO options; Adding a New Kernel to Boot ; Running LILO;The Steps of Booting; Enabling and disabling Services

**FILE SYSTEMS :** The Make up File Systems ; Managing File Systems; Adding and Partitioning a Disk; Network File Systems; Quota Management;

**CORE SYSTEM SERVICES :** The init Service ; The inetd and xinetd Processess;The syslogd Daemon;The cron Program

**PRINTING :** The Basic of lpd; Installing LPRng; Configuring /etc/printcap; The /ETC/lpd.perms File; Clients of lpd

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**MSIT-402** | **DATABASE ADMINISTRATION**

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## INSTRUCTION FOR CANDIDATES
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## Section-I

**Intro to Database and SQL Server 2000:** Client/Server Concept, Types of Databases, Relational Vs. Flat File Database. Background of SQL Server, Versions of SQL Server and Clients Supported by SQL Server. Installation & Configuring SQL Server: Installing SQL Server 2000, Unattended Installations, SQL Server Services. Configuring SQL Server Network Protocol Settings. Installing SQL Server Clients.

**SQL Server Tools and Utilities**: Managing SQL Server with Enterprise Manager, Query Analyser, SQL Server Groups. Tools Menu, Action Menu. Introduction to Transact – SQL(T-SQL)

### Section  II

**Managing Database:** Creating Database, Database File Placement(RAID 0, RAID 1 RAID 5), Creating Database using T-SQL and Enterprise Manager. Altering, Renaming, Dropping Database. Creating Objects in Database: Tables, Views, Constraints, Indexes.

**Managing Security:** Understanding Security Modes, Windows Authentication Modes, Mixed Mode, SQL Server Logins, Windows Logins, Fixed Server Logins, Creating Users, Database Roles, (Grant,Revoke ,Deny) N-Tier Security. Database Backups and Restore:   Copying Database with Copy Database Wizard. SQL Database Backup Modes(Full, Differential, Transactional Log Backup). Backing Up of the Database. Restoring Database. DTS: Its meaning, DTS Packages. DTS Storage and Designer.

### Section-III

**SQL Server Agent:** Configuring Understanding Alerts, Jobs and Events. Creating Jobs: Multi Server Jobs, Creating, Editing and Deleting of Jobs. SQL Server and IIS. Understanding the Static Page and Dynamic Pages of the Internet. Internet Database Connector. Replication and Performance Optimization: Overview of Replication. Installing. Types of Replication : Merge Replication, Snapshot Replication, Transactional Replication. Using Windows System Monitor: Monitor with SQL Profiler and Query Analyser. Optimization Techniques: Queries and Stored Procedure, Proper Indexing, Locks and Defragmentation.

| MSIT-403 | MANAGEMENT INFORMATION SYSTEM |
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### INSTRUCTIONS FOR PAPER-SETTER

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### INSTRUCTION FOR CANDIDATES
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### Section-I

**Management Information Systems : A Framework :** Importance of  MIS; Management Information System : A Concept ( Management, Information, System); MIS : A Definition

( Information Technology and MIS); Nature and Scope of MIS ( MIS Characteristics, MIS Functions).

**Structure and Classification of MIS :** Structure of MIS (MIS Structure Bases on Physical Components, Information System Processing Functions, Decision Support, Levels of Management Activities, Organisational Functions); MIS Classification (Transaction Processing System, Management Information System (MIS), Decision Support System (DSS), Executive Support System, Office Automation Systems (OASs), Business Expert Systems (BESs); Functional Information System (Financial Information System, Marketing Information System, Production/Manufacturing Information System, Human Resource Information System.

**Decision Making and MIS :** Decision-Making, Simon's Model of Decision-Making, Types of Decisions (Purpose of Decision-Making, Level of Programmability, Knowledge of Outcomes); Methods for Choosing Among Alternatives (Decision Theory or Decision Analysis, Utility, Decision Tree, Optimization Techniques); Decision Making and MIS.

### Section-II

**Information and System Concepts :** Information : A Definition; Types of Information (Strategic Information, Tactical Information, Operational Information); Information Quality; Dimensions of Information (Economic Dimension, Business Dimension, Technical Dimension); System : Definition (Multiple Meaning of the Word 'System'); Kinds of Systems (Abstract and Physical Systems, Deterministic and Probabilistic Systems, Open and Closed Systems, User-Machine Systems); System Related Concepts (Boundary, Interface and Black Box, System Decomposition, Integration of Sub-Systems); Elements of a System; Human as an Information Processing System (Information Filtering, Human Differences in Information Processing, Implications for Information Systems).

**System Development Approaches :** System Development Stages (System Investigation, System Analysis, System Design, Construction and Testing, Implementation, Maintenance); System Development Approaches (Waterfall Model, Prototyping, Iterative Enhancement Model, Spiral Model.

**System Analysis :** Introduction; Requirement Determination (Understand the Process, Identify Data Used and Information Generated, Determine Frequency, Timing and Volume, Know the Performance Controls); Strategies for requirement Determination (Interview, Questionnaire, Record Review, Observation); Structured Analysis Tools (Data Flow Diagram, Data Dictionary, Decision Tree and Structured English, Decision Table).

**System Design :** Design objectives; Conceptual Design (Define Problem, Set System Objectives, Identify constraints, determine information needs, determine information sources, develop various designs, documentation of the conceptual design, report preparation); Design Methods; Detailed System Design (Project Planning and Control, Involve the user, detailed sub-system definition, output/input design, feedback from the user, database design, procedure design, design documentation).

### Section-III

**Implementation and Evaluation of MIS :** Implementation process (planning and implementation, acquisition of facilities and space planning, MIS Organization and procedure development, User training, acquisition of hardware and software, Creation of forms and database, Testing, Change Over); Hardware and Software Selection (Requirements analysis, Preparation of Tender Specifications, Inviting Tenders, Technical scrutiny and short-listing, Detailed Evaluation, Negotiations and Procurement Decisions, Delivery and Installation, Post Installation Review); Evaluation of MIS (Evaluation Approaches, Evaluation Classes, Product Based MIS Evaluation, Cost/Benefit  Based Evaluation); System Maintenance (Corrective Maintenance, Adaptive Maintenance, Perfective Maintenance).

**Information System Planning :** Information System Planning; Planning Terminology (Mission, Objectives, Strategies, Policies); The Nolan Stage Model; The Four Stage Model of IS Planning (Strategic Planning, Information Requirement Analysis, Resource Allocation, Project Planning); Selecting a Methodology; Information Resource Management (IRM); Organization Structure and Location of MIS.

**Information System as an Enabler :** Introduction; Changing Concepts of IS (Information as a necessary Evil, Information for General Management Support, Information for decision making, Information as a Strategic Resource); IS as an Enabler (Competitive advantage, Organizational Change, Organizational Learning).

| MSIT-404 | ADVANCE JAVA DEVELOPMENT |
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**INSTRUCTION FOR CANDIDATES**
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**Section-I**

**JAVA AWT :** java AWT package Containers (Component, Container, Panel, Window, Frame, Canvas),  Basic User Interface components (Labels, Buttons, Check Boxes, Radio Buttons, Choice, Text Fields, Text Areas, Scrollbars), Layouts (Flow Layout, Grid Layout, Border Layout, Card Layout).

**EVENT HANDLING :** Event delegation Approach, ActionListener,  AdjustmentListener, MouseListener and MouseMotionListener, WindowListener, KeyListener

**Section-II**

**JAVA I/O HANDLING :** I/O File Handling(InputStyream & OutputStreams, FileInputStream & FileOutputStream, Data I/P and O/P Streams, Buffered I/P and O/P Streams, File Class, Reader and Writer Streams, RandomAccessFile).

**MULTITHREADING :** Overview of Multithreading, The Thread control methods, Thread life cycle, Newly created threads, Main thread, Creating a Thread (Implementing Runnable Interface, Extending the Thread Class), Thread Synchronization, Writing Applets with Threads.

**SOCKET PROGRAMMING :** Introduction, TCP/IP Protocol, UDP Protocol, Ports, Using TCP/IP Sockets, Using UDP Sockets.

**Section-III**

**JAVA DATABASE CONNECTIVITY (JDBC) :** JDBC/ODBC bridge, DriverManager Class, Java.SQL Package (Connection Interface, Statement Interface, Prepared Statement Interface, ResultSet Interface, ResultSetMetaData Interface), SQL Exception class.

**REMOTE METHOD INVOCATION :** N-tier Architecture, Distributed object technologies, Locating & loading Remote classes, Locating remote objects & providing references to them, Enabling remote method class, RMI Architecture(Application Layer, Proxy Layer, Remote Reference Layer, Trasport Layer),Naming, Remote Interface, Unicast Remote Object, Socket Vs RMI programming

**JAVA SERVLETS :** Introduction to Server Side Technologies, Servlet Life cycle, HttpServlets, GenericServlets, init(),service(), doGet(), doPost(), destroy() , Servlets & JDBC.