

**DETAILED SYLLABUS  
FOR  
MASTER OF SCIENCE (COMPUTER SCIENCE)**

**MSc (CS)**

**(EFFECTIVE FROM JULY 2019)**



**DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS  
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B-38 PRESS COMPLEX M.P. NAGAR ZONE-I BHOPAL-462011**

## MSC(CS) COURSE STRUCTURE

### SEMESTER I

Subject Code	Subject Name	L	T	P	C	Theory Marks	Internal Marks	Practical Marks	Total Marks
1MSC(CS)1	Information Technology	5	0	0	5	80	20	-	100
1MSC(CS)2	PC Packages	5	0	0	5	80	20	-	100
1MSC(CS)3	Digital Electronics and Computer Organization	5	0	0	5	80	20	-	100
1MSC(CS)4	Programming in C	5	0	0	5	80	20	-	100
1MSC(CS)5	Communicative English	5	0	0	5	80	20	-	100
1MSC(CS)6	Computer Lab 1	0	0	10	5	-	20	80	100
	<b>Total Credits and Marks</b>				<b>30</b>				<b>600</b>

### SEMESTER II

Subject Code	Subject Name	L	T	P	C	Theory Marks	Internal Marks	Practical Marks	Total Marks
2MSC(CS)1	Data Structures and Algorithms	5	0	0	5	80	20	-	100
2MSC(CS)2	Database Management System	5	0	0	5	80	20	-	100
2MSC(CS)3	Computer Networks	5	0	0	5	80	20	-	100
2MSC(CS)4	Object Oriented Programming with C++	5	0	0	5	80	20	-	100
	<b>Elective:</b>								
2MSC(CS)5(A)	Management Theory and Practice	5	0	0	5	80	20	-	100
2MSC(CS)5(B)	Numerical Methods								
2MSC(CS)5(C)	Computerised Accounting with Tally								
2MSC(CS)6	Computer Lab 2	0	0	10	5	-	20	80	100
	<b>Total Credits and Marks</b>				<b>30</b>				<b>600</b>

**SEMESTER III**

Subject Code	Subject Name	L	T	P	C	Theory Marks	Internal Marks	Practical Marks	Total Marks	
3MSC(CS)1	Web Technology	5	0	0	5	80	20	-	100	
3MSC(CS)2	Software Engineering	5	0	0	5	80	20	-	100	
3MSC(CS)3	Operating System	5	0	0	5	80	20	-	100	
3MSC(CS)4	Programming with Java	5	0	0	5	80	20	-	100	
3MSC(CS)5(A)	<b>Elective:</b> Multimedia Applications	5	0	0	5	80	20	-	100	
	3MSC(CS)5(B)									Data Warehousing and Mining
	3MSC(CS)5(C)									Cloud Computing
	3MSC(CS)5(D)									E-Commerce and E-Governance
	3MSC(CS)5(E)									Linux Server Administration
3MSC(CS)6	Computer Lab 3	0	0	10	5	-	20	80	100	
	<b>Total Credits and Marks</b>				<b>30</b>				<b>600</b>	

**SEMESTER IV**

Subject Code	Subject Name	L	T	P	C	Theory Marks	Internal Marks	Practical Marks	Total Marks	
4MSC(CS)1	Python Programming	5	0	0	5	80	20	-	100	
4MSC(CS)2	Dot Net Technology	5	0	0	5	80	20	-	100	
4MSC(CS)3(A)	<b>Elective:</b> Software Testing and Quality Assurance	5	0	0	5	80	20	-	100	
	4MSC(CS)3(B)									Big Data Analytics
	4MSC(CS)3(C)									Information Security
	4MSC(CS)3(D)									Artificial Intelligence and Machine Learning
	4MSC(CS)3(E)									Mobile Application Development
4MSC(CS)4	Computer Lab 4	0	0	10	5	-	20	80	100	
4MSC(CS)5	Project Work	0	0	20	10	-	40	160	200	
	<b>Total Credits and Marks</b>				<b>30</b>				<b>600</b>	

(\*L-Lecture T- Tutorial P-Practical C-Credit)

**General Instructions:**

1. For passing the subject examination minimum 40% marks must be separately scored in Theory Paper Practical Exams and Internal Evaluation in the subject.
2. Please refer concerned regulation for details

**SEMESTER I****1MSC(CS)1- INFORMATION TECHNOLOGY**

L	T	P	C	Theory Paper	Practical Exams	Internal Evaluation	Total Marks
5	0	0	5	80	--	20	100

**Course Objectives:**

- Identify all the parts and main functions of computers.
- Acquaint the students with the applications of computers and understanding latest trends in information technology.
- Learn Basics of software Systems and Linux operating systems

**Course Outcomes:**

1. Use and identify various part (input output devices) of computer system.
2. Explain functions of various parts and function of computer.
3. Use Linux operating system and create files and folders.
4. Explain Software Hardware Components of Computer system.

**Unit-wise Syllabus :****UNIT-1**

Introduction Evolution of Computers Computer Generations Classification of Computers Computer Applications Introduction : Historical evolution of computers Classification of computers Block Diagram along with its components and characteristics Applications of computers. Number Systems: Definition of Number system necessity of binary number system ,Decimal, Octal, and Hexadecimal number system interconversion of numbers, Representation of integers fixed and floating points BCD codes Error Detecting and Correcting Codes character Representation-ASCII EBCDIC Binary arithmetic

**UNIT-2**

Computer Organization Memory and Storage: Introduction Basic Computer Organization Input Devices Output Devices Central Processing Unit The System Bus Architecture Memory or Storage Unit Input/Output Devices: Keyboards mouse joysticks trackballs digitizer voice-recognition optical-recognition scanners terminals point-of-sale terminals machine-vision systems. Hard-copy devices: Impact printers -DMPs Daisy-wheel printers Line-printers. Non-impact printers - Inkjet Laser Thermal LED; Plotters. Monitors Memory & Mass Storage Devices: Characteristics of memory systems types of memory RAM ROM magnetic disks - floppy disk hard-disk; optical disks - CD; Magnetic tapes; Concepts of Virtual and Cache memory

**UNIT-3**

Software and its Need Types of Software - System software Application software System Software - Operating System Utility Program Programming languages Assemblers Compilers and Interpreter Introduction to operating system for PCs-DOS Windows Linux.

Programming languages- Machine Assembly High Level 4GL their merits and demerits Application Software and its types - Word-processing Spreadsheet Presentation Graphics Data Base Management Software characteristics Uses and examples and area of applications of each of them Virus working principles Types of viruses virus detection and prevention.

**UNIT-4**

Introduction Electronic Commerce (E-Commerce) Electronic Data Interchange (EDI Smart Cards Mobile Communication Internet Protocol TV  
Digital Marketing :E-Marketing in an Entrepreneurial Context The role of new media marketing in getting funds and support E models for revenue E-customers Social media marketing Developing New Products and Services E-CRM Managing digital marketing effort. Web Strategy Email marketing & Technology Internet marketing Consulting Affiliate marketing network creation and management Driving traffic through search engine marketing Search engine and directory submission services Signature based article marketing services Affiliate marketing network creation and management Paid Advertising (Banner Text adverts) Web Analytics based campaign management Customized internet Marketing Solution Social Media Optimization Services Brand Engagement Google Analytics Integration

**UNIT-5**

LINUX - Linux introduction Basic Features Advantages Installing requirement Basic Architecture of Unix/Linux system Kernel Shell start-up and shut-down process init and run levels. Essential Linux commands Understanding shells Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir pwd, file more less creating and viewing files using cat file comparisons – cmp & comm View files disk related commands checking disk free spaces. Batch commands kill ps who sleep Printing commands find sort touch file file related commands-ws,sat, cut,dd, etc. Mathematical commands- bc expr,factor,units Creating and editing files with vi, joe & vim editor

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**REFERENCE BOOKS:**

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1. Pradeep K Sinha Priti Sinha Computer Fundamentals Sixth Edn. BPB Publications
2. S.K.Basandra “Computers Today “ Galgotia Publications.
3. Alexis Leon & Mathews Leon “Fundamentals of Information technology “ Vikas Publishing House New Delhi.
4. V.Rajaraman Neeharika Adabala Computer Fundamentals PHI
5. Cristopher Negus "Red Hat Linux 9 Bible" IDG Books India Ltd.
6. Yashwant Kanetkar "Unix Shell Programming" BPB Publications
7. Red Hat Linux Unleashed Techmedia (Bpb Publications)
8. Jan Zimmerman and Deborah Ng -Social Media Marketing All-In-One for Dummies - 2017
9. Ryan Deiss and Russ Hennesberry Digital Marketing for Dummies- 2017

## 1MSC (CS) 2- PC PACKAGES

L	T	P	C	Theory Paper	Practical Exams	Internal Evaluation	Total Marks
5	0	0	5	80	--	20	100

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### *Course Objectives:*

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- To provide an in-Depth Training in use of office Automation Packages.
- To Understand the Basics of Windows Operating Systems
- To Understand How to use Software Packages in Day to Day Activities

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### *Course Outcome:*

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1. Creating Word Documents for office use Knowledge of Mail Merge.
2. Use of Formatting Techniques and Presentation Styles.
3. Provide Professional Services to the Society.
4. Create Presentation Using Animation and Transition and other features.
5. Construct Formulas Including the use of Built-in Functions and Relative and Absolute References and Create and Modify Charts and Preview and Print Worksheets.

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### *Unit-wise Syllabus :*

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#### **UNIT-I**

**MS Windows:** Introduction to Ms Windows; Features of Windows; Various Versions of Windows & its use; Working with Windows; My Computer & Recycle Bin ; Desktop Icons and Windows Explorer; Screen Description & Working Styles of Windows; Dialog Boxes & Toolbars; Working with Files & Folders; Simple Operations Like Copy Delete Moving of Files and Folders from One Drive to Another Shortcuts & Autostarts; Accessories and Windows Settings Using Control Panel-Setting Common Devices Using Control Panel Modem Printers Audio Network Fonts Creating Users Internet Settings Start Button & Program Lists; Installing and Uninstalling New Hardware & Software Program on Your Computer.

#### **UNIT- II**

**Office Packages:** office Activates and Their Software Requirements Word-Processing Spreadsheet Presentation Graphics Database Introduction and Comparison of Various office Suites Like Ms-office Lotus-office Star-office Open-office etc.

**Ms Word Basics:** Introduction to Ms office Introduction to Ms Word Features & Area of use. Working with Ms Word Menus & Commands Toolbars & Buttons Shortcut Menus Wizards & Templates Creating a New Document Different Page Views and Layouts Applying Various Text Enhancements Working with -Styles Text Attributes Paragraph and Page Formatting Text Editing Using Various Features ; Bullets Numbering Auto Formatting Printing & Various Print Options

#### **UNIT- III**

**Advanced Features of Ms-Word:** Spell Check Thesaurus Find & Replace; Headers & Footers Inserting - Page Numbers Pictures Files Autotext Symbols etc. Working with Columns Tabs & Indents Creation & Working with Tables Including Conversion to and from Text Margins & Space Management in Document Adding References and Graphics Mail Merge Envelops & Mailing Labels. Importing and Exporting to and from Various Formats.

#### **UNIT- IV**

**Ms Excel:** Introduction and Area of use Working with Ms Excel Concepts of Workbook & Worksheets Using Wizards Various Data Types Using Different Features with Data Cell and Texts Inserting Removing & Resizing of Columns & Rows Working with Data & Ranges Different Views

of Worksheets Column Freezing Labels Hiding Splitting etc. Using Different Features with Data and Text; use of Formulas Calculations & Functions Cell Formatting Including Borders & Shading Working with Different Chart Types; Printing of Workbook & Worksheets with Various Options.

**UNIT- V**

**Ms PowerPoint:** Introduction & Area of use Working with Ms PowerPoint Creating a New Presentation Working with Presentation Using Wizards; Slides & its Different Views Inserting Deleting and Copying of Slides; Working with Notes Handouts Columns & Lists Adding Graphics Sounds and Movies to a Slide; Working with PowerPoint Objects Designing & Presentation of a Slide Show Printing Presentations Notes Handouts with Print Options.

**Outlook Express:** Features and Uses Configuration and Using Outlook Express for Accessing E-Mails in office.

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**Reference Books:**

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1. Windows XP Complete Reference. BPB Publications
2. Ms Office XP Complete BPB Publication
3. Ms Windows XP Home Edition Complete BPB Publication.
4. Joe Habraken-Microsoft Office 2000 8 in 1 Prentice Hall of India
5. A. Mansoor I.T. Tools and Applications Pragma Publications Matura

## 1MSC (CS) 3-DIGITAL ELECTRONIC AND COMPUTER ORGANIZATION

L	T	P	C	Theory Paper	Practical Exams	Internal Evaluation	Total Marks
5	0	0	5	80	--	20	100

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### *Course Objectives:*

- Understand Data Representation for Digital Logic
- Understand the Basic Blocks of Digital Logic
- Understand the Fundamental Organization of a Digital Computer
- Design Simple Combination & Sequential Circuits
- Examine the Basics of General Programming
- Learn the Microprogrammed Controls
- Learn the Memory and I/O Organization.

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### *Course Outcome:*

1. Understand and Represent Data in Different Binary Formats
2. Design Simplify and evaluate Boolean Equations and Circuits
3. Explain and Analyse Basic Building Blocks of Digital Electronics and Computer
4. Design and Analyse Simple Combination & Sequential Circuits
5. Analyse the Basic Computer Organisation and Programming
6. Understand the Organisation of I/O Devices and Computer Memory Mapping.

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Data Representation Data Types and Number Systems Binary Number System Octal & Hexa-Decimal Number System Fixed Point Representation 1's & 2's Complement Binary Fixed- Point Representation Arithmetic Operation On Binary Numbers Overflow & Underflow Floating Point Representation Codes ASCII EBCDIC Codes Gray Code Excess-3 & BCD Error Detection & Correcting Codes Binary Storage and Registers.

#### **UNIT- II**

Boolean Algebra and Digital Logic Circuits -Logic Gates and OR NOT Gates and Their Truth Tables NOR, NAND & XOR Gates Boolean Algebra Basic Definition and Properties Basic Boolean Law's Demorgan's Theorem Map Simplification Minimization Techniques K Map – Two Three and More Variables Maps Sum of Product & Product of Sums Don't Care Conditions Combination Circuits Half Adder & Full Adder, Full Subtractor, and Decimal Adder Code Conversion Multilevel NAND and NOR Circuits Multiplexers and Demultiplexers, RAM and ROM Working & Circuit

#### **UNIT- III**

Sequential Circuits Flip-Flops - RS D JK & T Flip-Flop Triggering in Flip Flops Analysis of Clocked Sequential Circuits State Reduction and Assignment Flip Flop Excitation Tables Registers Counters and the Memory UNIT Shift Registers Ripple Counters and Synchronous Counters Design of Counters. Common Bus System Computer Instructions Timing and Control Instruction Cycle Memory-Reference Instructions Complete Computer Description



**UNIT- IV**

Design of Basis Computer Control Logic Gates Control of Registers and Memory Design of Accumulator Logic Control of Ac Register Adder and Logic Circuit Multiple Bus Organization of Computer Memory Addressing Micro Program Programming the Basis Computer Machine Languages Assembly Language.

**UNIT- V**

Input-Output Organizations- I/O Interface I/O Devices Isolated Vs Memory-Mapped I/O Synchronous & Asynchronous Data Transfer. Memory Organization - Auxiliary Memory Magnetic Drum Disk & Tape Semi-Conductor Memories Direct Memory Access (DMA) Memory Hierarchy Main Memory Auxiliary Memory Associative Memory Cache Memory Virtual Memory Address Space & Memory Space Address Mapping Page Table Page Replacement Segmentation Cache Memory Hit Ratio Mapping Techniques Memory Management Hardware.

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***Reference Books***

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1. M. Morris Mano-Computer System Architecture Revised 3rd Edition Pearson Publication.
2. Morris Mano-Digital Logic and Computer Design

## 1MSC(CS)4 -PROGRAMMING IN C

L	T	P	C	Theory Paper	Practical Exams	Internal Evaluation	Total Marks
5	0	0	5	80	--	20	100

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### *Course Objectives:*

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- To Make the Student Learn a C Programming Language.
- To Learn Problem Solving Techniques using C.
- To Teach the Student to Write Programs in C and to Solve the Problems.
- To Teach the Concepts of C Programming Like Control Structures Functions Learn About Arrays Structures and Union etc.

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### *Course Expected Outcome:*

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1. Explain the Basic Terminology Used in Computer Programming.
2. Explain the Process of Problem Solving Using C Programming Language.
3. Write Compile and Debug Programs in C Language.
4. Analyze and Solve Complex and Real Life Problems by Developing Application Programs using C Programming Language.

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### *Unit-wise Syllabus :*

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#### **UNIT-I**

Problem Identification Analysis Design Coding Testing & Debugging Implementation Modification & Maintenance; Algorithms & Flowcharts; Characteristics of a Good Program; Top Down Design; Bottom-Up Design.

#### **UNIT- II**

History of C; Structure of a C Program; Data Types; Constant & Variable Naming Variables, Operators & Expressions Priority & Associativity of Operators; Control Constructs; Case Switch Statement; Arrays and its Types; Formatted & Unformatted I/O; Type Modifiers & Storage Classes; Ternary Operator; Type Conversion & Type Casting.

#### **UNIT- III**

Functions Basics; Arguments; Return Value; Parameter Passing Techniques – Call by Value Call by Reference; Return Statement; Scope Visibility and Life-Time Rules for Various Types of Variable; Calling a Function; Recursion, Types of Recursion- Direct Indirect Tree and Tail Recursion When to Avoid Recursion.

#### **UNIT- IV**

Special Constructs: Break Continue Exit() Goto & Labels; Pointers: & and \* Operators Pointer Expression Pointer Arithmetic String; Pointer V/S Array; Pointer to Pointer; Array of Pointer & its Limitation; Function Returning Pointers; Pointer to Function ,Pointer as Function Parameter; Structure: Basics Pointer to Structure Referential Operator Self Referential Structures Structure Within Structure Array in Structure Array of Structures; Union: Basics Declaration and use; Difference B/W Structure and Union.

#### **UNIT- V**

DMA: Dynamic Memory Management Concept and its Functions; File Handling: File Handling Concept and its Related Functions; Types of File and Differences b/w Them; Command Line

Argument; File as Command Line Argument; C Preprocessor: Basics; Various Preprocessor Directives and Their use.

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***Reference Books:***

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1. Kerningham & Ritchie “The C Programming Language” PHI
2. Schildt “C: the Complete Reference” 4th Ed TMH.
3. Kanetkar Y. “Let Us C” BPB.
4. Kanetkar Y.: “Pointers in C” BPB
5. Gottfried : “Problem Solving in C” Schaum Series
6. Balagurusami “Programming in ANSI C” 7th Ed McGraw Hill Education.

## 1MSC (CS) 5 - COMMUNICATIVE ENGLISH

L	T	P	C	Theory Paper	Practical Exams	Internal Evaluation	Total Marks
5	0	0	5	80	--	20	100

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### *Course Objectives:*

- Learn and Develop the Skills of Writing Speaking Reading and Listening.
- Learn how to write Effectively SRS and Project Reports in English.
- Gain the Knowledge and Develop Personality through Participation in Group Discussion Mock Interview Group and Individual Presentation

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### *Course Outcome:*

1. Demonstrate the Competency in English Language through Understand ability and Practice in Four Skills of Language Such as Writing Speaking Reading and Listening.
2. Think Critically and Communicate Effectively in English and Prepare SRS and Project Reports.
3. Information Seeking Skills And Strategies Needed to be Conducted
4. Inculcate Soft Skills and Develop Personality through Participation in Group Discussion Mock Interview Group and Individual Presentation

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### *Unit-wise Syllabus :*

#### **UNIT-I**

The Process of Communication: Communication the Process of Communication Barriers of Communication Different Types of Communication Characteristics and Conventions of Conversation Conversational Problems of Second/Foreign Language Users Difference Between Conversation and Other Speech Events

#### **UNIT- II**

Telephone Techniques: Speaking and Listening Conference Calls Vocabulary Building Writing Grammar and Usage Pronunciation Job Applications and Interviews: Reading Curriculum Vitae Preparing for an Interview Listening and Speaking in the Interviews Group Discussions: Group-Discussion Study Skills Language Focus Speaking.

#### **UNIT- III**

Soft Skills Practice Personality Development Participating in Group Discussion and Job Interviews Time Management Presentation Skills Leadership Skills Assertiveness Lateral Thinking Team Work and Interpersonal Skills Emotional Intelligence Self-Confidence and Courage Attitude Presentation Skills: Presentation Skills Importance of Body Language in Presentations Pronunciation Visual Aids Podium Panic Speaking

#### **UNIT- IV**

Managing Organizational Structure: Role of a Manager Leadership Language Focus Writing Reports Pronunciation Meetings: Successful Meeting One to One Meeting Editing Criteria for Successful Meetings Reporting Verbs Memos Taking Notes and Preparing Minutes: Taking Notes Preparing Minutes Grammar

#### **UNIT- V**

Functional Grammar- Tenses: Simple Present Progressive Perfect Present Perfect Progressive Along-with Past Tense and Indications of Futurity Reported Speech Modals: Will Shall Should Would and Others Voice: Active and Passive

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***Reference Books***

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1. Darer. Shankar-Communication Skills in English Language
2. Dr. Uremia Rai and S.M.Rai - Business Communication
3. B. K. Das- an Introduction to Professional English and Soft Skills
4. Barun K. Mitra- Personality Development and Soft Skills
5. Shashikumar and Dhameja -Spoken English
6. Raymond Williams- English Grammar
7. Wren and Martin -English Grammar and Composition
8. Justin Seeley -Designing Presentation
9. Laura Bergelles- Public Speaking Foundations
10. M.A.K. Halliday- Spoken and Written Language
11. B Balasubriamianiam - Phonetics for Indian Students
12. R C Sharma- Business Correspondence
13. Dowel Jones- the Handbook of English Phonetics
14. Merriam Webster - Guide to Business Correspondence.
15. Ashish Singh - How to Communicate Effectively

**1MSC (CS) 6-COMPUTER LAB 1**

L	T	P	C	Theory Paper	Practical Exams	Internal Evaluation	Total Marks
0	0	10	5	--	80	20	100

**Linux Lab:** Experiment with each of these commands:

mkdir rmdir cd ls pwd cat head more rm cp who date cal man

1. Type the command whoami
2. Create a new directory named lab2
3. Change directories into lab2
4. List all files even hidden files (directory should be blank)
5. Create a new file that contains the calendar for this month
6. List all files again even hidden files (there should be just one file)
7. Display the entire contents of that new file
8. Delete the file
9. Ask the system when is easter in 2012
10. Ask the system for today's date

**PC PACKAGE LAB:****A. Experiment on Word Processing:**

1. Type the Following Paragraph as Given.

“My Dream Career”

My Ambition of Life is to Become a Doctor. I Have Taken Up Science and Hygiene as Optional Subjects. When I Joint College I Shall Take UP Medical Group. I Shall Appear in the P.M.T. Examination to Qualify for Joining a Medical College. After Passing the P.M.T. I Shall Join the Medical College to Become a Doctor.

I Would Like to Be a Doctor. My Country Has Become Free from Diseases Government Has Decided to Uproot the Diseases from the Country and Improve the Health of the People. Hospitals are Being Opened for This Purpose. There is Great Demand for Doctor. Taking All These Things into Consideration I Have Made Up Mind to Become a Doctor.

I Do Not Want to Be Clerk. This Line Does Not Suit Me. I Do Not Want to Be a Teacher. Law is Not a Paying Profession These Days So Becoming Lawyer is Not My Goal.

2. Correct any Spelling Errors Displayed in the Given Text.
3. Save the Document as <My Dream >\_W01.
4. Change the Layout of the Page as Given Below.  
>Page Size: A4 (8.27" X 11.69") >Page Orientation: Landscape
5. Change the Page Margins as Follows:  
>Top: 1.25">Bottom: 1.25">Right: 1.25">Left: 1.25"
6. Format the Entire Document as Given Below.  
>Line Spacing: 1.15" >Font: Times New Roman >Font Size: 14  
>Align: Justify
7. Select the Heading “Academy Award” and Format It as Given Below.  
>Font Color: Blue >Style: Bold and Underline >Align: Center

>Change All the Letters to Uppercase

8. Make the First Letter of the Paragraph Larger and Fall into Three Lines (Drop Cap).
9. Format the Heading "My Dream Career" with Style: Heading 2.
10. Create a Bulleted List for the Last Paragraph Lines of Document.
11. Enter "My Document Tutorial" Text as the Heading of the Table and Format It to Get the Following Output Using a Word Art. (Font: Arial Black Font Size: 16 Align: Center)
12. Insert Footer with the Following Formatting Options.
  - >Caption: <My First Document>>Font: Times New Roman >Font Size: 12
13. Insert the W01 Image Given in the "Resources" Directory to the Right Hand Side of the Bulleted List of the Document.
14. Prepare Your Class Time Table Using and Format the Entire Table as Given Below.
  - > Change the Cell Size of the Table to Auto Fit to Contents. >Align: Center
15. Select the Heading Row and Format It as Given Below.
  - > Convert All Text in to Capital Letters >Style: Bold >Align: Center
16. Insert a New Row Just Below the Last Row of the Table and Enter the Following Information into the New
  - Row: >Saturday : Special Lecture On Cloud Computing > Merging All the Column.
17. Send a Call Letter for All Applicants to Inform Interview Details Using Mail Merge Base
18. Preparing a Govt. Order / official Letter / Business Letter / Circular Letter
  - Covering Formatting Commands - Font Size and Styles - Bold Underline Upper Case Lower Case Superscript Subscript Indenting Paragraphs Spacing Between Lines and Characters Tab Settings etc.
19. Preparing a News Letter:
  - To Prepare a Newsletter with Borders Two Columns Text Header and Footer and Inserting a Graphic Image and Page Layout.
20. Creating and Using Styles and Templates
  - To Create a Style and Apply That Style in a Document
  - To Create a Template for the Styles Created and Assemble the Styles for the Template.
21. Creating and Editing the Table
  - To Create a Table Using Table Menu
  - To Create a Monthly Calendar Using Cell Editing Operations Like Inserting Joining Deleting Splitting and Merging Cells
  - To Create a Simple Statement for Math Calculations Viz. Totaling the Column.
22. Creating Numbered Lists and Bulleted Lists
  - To Create Numbered List with Different Formats (with Numbers Alphabets Roman Letters)
  - To Create a Bulleted List with Different Bullet Characters.
23. Printing Envelopes and Mail Merge.
  - a. To Print Envelopes with from Addresses and to Addresses
  - b. To use Mail Merge Facility for Sending a Circular Letter to Many Persons
  - c. To use Mail Merge Facility for Printing Mailing Labels.

24. Using the Special Features of Word
25. To Find and Replace the Text
26. To Spell Check and Correct.
27. To Generate Table of Contents for a Document
28. To Prepare Index for a Document.
29. Create an Advertisement
30. Prepare a Resume.
31. Prepare a Corporate Circular Letter Inviting the Share Holders to Attend the Annual Meeting

### **B. Spreadsheet Experiment:**

1. Create a Blank Spreadsheet in and Save It as "<Your Index No>\_E01".
2. Create a Table with 7 Rows and 8 Columns in the Cell Range A3:H9.
3. Insert a Title "Vivekananda College " and a Sub Title "Mark Sheet for a/L Biology- Class a" by Centering It with the Table Making the Text Bold and Changing the Font Size 16 for Main Title and 14 for Subtitle.
4. Enter Data of 6 Students Under the Columns "Roll No" "Name" "Physics" "Chemistry" "Biology" and "English".
5. use the Relevant Formula to Calculate the Total Marks and Average and Copy the Formula to the Relevant Cells.
6. Format the "Average" Column with Two Decimal Places.
7. use Conditional Formatting to Change the Color of the Cells of Which the Average Mark is More Than 60 into Green.
8. Select the Columns "Roll No" "Physics" "Chemistry" "Biology" and "English" Column and Draw a Column Chart.
9. Insert the Title "Vivekananda College " and the Sub Title "Mark Sheet for a/L Biology - Class a" to the Top of the Chart.
10. Set the X Axis Labels with the Index Numbers.
11. Label the X Axis Title as "Roll No" and Y Axis Title as "Marks".
12. Label the Legends for 4 Subjects "Physics" "Chemistry" "Biology" and "English".
13. Make Sure to Get a Graph Similar to the One Given Below.
14. Sorting Data Filtering Data and Creation of Pivot Tables.
15. Operating On the Sheets: Finding Deleting and Adding Records Formatting Columns Row Height Merging Splitting Columns etc. Connecting the Worksheets and Enter the Data.

### **C.Presentation Experiments**

1. Create a Presentation with Four Blank Slides.
  - a. Insert a Suitable Design Template.
  - b. Insert a Footer to Show Your Name and Your Student Id.
  - c. Insert Today's Date as a Fixed Date in the Date Area.
  - d. Make Necessary Changes to Appear Slide Numbers in the Slide Number Area.
  - e. Make Necessary Changes So That the Footer Date and the Slide Number Do Not Appear On the Title Slide (First Slide).
  - f. Add Content to the Title Slide (First Slide) by Following the Instruction Given Below.
  - g. Type "River" as the Slide Title and It's Format Should Be Font Type: Arial Style: Bold Size:96 Color: Black [10 Marks]



- h. Type "Our Life Support" as the Sub Title and Insert an Image from the Resources Directory to a Suitable Location.
- i. Add Content to the Second Slide By Following the Instruction Given Below.
- j. Type the Slide Title as "Rivers of North India" and Format It as
  - Font Type: Arial Style: Bold Size: 44 Color: Black
- k. Insert the Following Content as Shown Below.
  - The Ganga
  - The Indus
  - The Brahmaputra

In the Third Slide Add the Following Components.

- a. Type the Slide Title as "Tributaries"
- b. Insert Rivers and Their Tributaries of Slide 2 in a Table.
- c. Insert Few More Important Rivers of India with Their Regions.
- d. Add the Following Animation Effects to Your Presentation.
- e. Apply Emphasis Animation Effect to Each Main Point and Sub Point in the Second Slide.
- f. Apply Sound Effect When the Second Slide Appears in the Slideshow.
- g. Hide the Fourth Slide from the Slide Show.
- h. Save Your Presentation with the Following File Name <Rivers\_of\_North India>\_P01.

#### D. Additional Practicals

1. Creating a New Presentation Based On a Template – Using Auto Content Wizard Design Template and Plain Blank Presentation.
2. Creating a Presentation with Slide Transition – Automatic and Manual with Different Effects.
3. Creating a Presentation Applying Custom Animation Effects –
4. Applying Multiple Effects to the Same Object and Changing to a Different Effect and Removing Effects.

#### C Programming Lab:

1. Write a Program in C to Calculate Simple Interest When the Values of Principal Rate and Time are given.
2. Write a Program in C to Calculate Area of a Circle When its Radius is Input from Keyboard.
3. Write a Program in C to Calculate Temperature in Centigrade When Temperature in Fahrenheit is Input from Keyboard.
4. Write a Program in C to Calculate Area of a Triangle When its Three Sides are Input from Keyboard (by Hero's Formula).
5. Write a Program in C to Determine Whether an Input Year is Leap Year or Not.
6. Write a Program in C to Display the Table of a Number Input from Keyboard in the Following Format:  
 $N \times 1 = N$   
 Eg:    5 X 1 = 5  
       i. 5 X 2 = 10
7. Write a Program in C to Display the Table of Tables from 1 to 10.
8. Write a Program in C to Display the Following Patterns
9. Write a Program to Calculate the Factorial of a Number Input from Keyboard Using Recursive Method.
10. Write a Program in C to Show How to Pass an Array to a User Defined Function.

11. Write a Program in C to Display Largest Element of an Array When the Elements of the Array are Input from Keyboard.
12. Write a Program in C to Calculate Area of a Circle in a User Defined Function.
13. Write a Program in C to Swap Two Numbers Using Call by Value and Call by Address.
14. Write a Program in C to Reads Name Roll No Percentage of Five Students and Display Them Using Array of Structures.
15. Write a Program in C to Show How to Pass a Structure to a User Defined Function.
16. Write a Program to Calculate Total Marks Percentage and Grade of a Student. Marks Obtained in Each of the Five Subjects are to Be Input by the User. Assign Grades According to the Following Criteria:
  - a. Grade a: Percentage  $\geq 80$
  - b. Grade B: Percentage  $\geq 70$  and  $< 80$
  - c. Grade C: Percentage  $\geq 60$  and  $< 70$
  - d. Grade D: Percentage  $\geq 40$  and  $< 60$
  - e. Grade E: Percentage  $< 40$
17. Write a Menu-Driven Program Using User-Defined Functions to Find the Area of Rectangle Square Circle and Triangle By Accepting Suitable Input Parameters from User.
18. Write a Program in C to Display the First N Terms of Fibonacci Series.
19. Write a Program in C to Calculate the Sum of Two Compatible Matrices.
20. Write a Program in C to Calculate the Product of Two Compatible Matrices.
21. Group Assignment
  - I. Design Simple Calculators
  - II. Design Marksheet for MCA
  - III. Design Ludo Game

**SEMESTER II****2MSC (CS) 1-DATA STRUCTURES AND ALGORITHMS**

L	T	P	C	Theory Paper	Practical Exams	Internal Evaluation	Total Marks
5	0	0	5	80	--	20	100

**Course Objectives:**

- Learn Basic Data Structures Such as Linked Lists Stacks and Queues Tree and Graph.
- Learn Algorithm for Solving Problems Like Sorting Searching Insertion and Deletion of Data
- Understand the Complexity of Various Algorithms.
- Introduce Various Techniques for Representation of the Data in in Memory.

**Course Outcomes:**

1. Understand and explain Basic Data Structures Such as Linked Lists Stacks and Queues Tree and Graph.
2. Select and apply Appropriate Data Structures to define the particular Problem statement.
3. Implement Operations Like Searching/Sorting Insertion and Deletion Traversing on Various Data Structures.
4. Determine and Analyze the Complexity of Given Algorithms

**Unit-wise Syllabus :****UNIT-I**

Algorithm Analysis and Complexity Data Structure- Definition Types of Data Structures Recursion: Definition Linear and Binary Recursion Searching Techniques Linear Search Binary Search.

**UNIT- II**

Sorting Techniques: Basic Concepts Sorting by: Insertion (Insertion Sort) Selection (Heap Sort) Exchange (Bubble Sort Quick Sort) Distribution (Radix Sort) and Merging (Merge Sort) Algorithms.

**UNIT- III**

Stacks and Queues: Stacks: Basic Stack Operations Representation of a Stack Using Arrays Stack Applications: Reversing List Factorial Calculation Infix to Postfix Transformation Evaluating Arithmetic Expressions.

Queues: Basic Queue Operations Representation of a Queue Using Array Implementation of Queue Operations Using Stack. Circular Queues Priority Queues. Applications of Queues- Round Robin Algorithm

**UNIT- IV**

Linked Lists: Introduction Single Linked List Representation of a Linked List in Memory Operations on a Single Linked List Circular Linked List Double Linked List Advantages and Disadvantages of Linked List.

**UNIT- V**

Trees: Terms Related to Tree Binary Tree Binary Tree Traversals Creation of Binary Tree from in-Order Pre-Order and Post-Order Traversals. Threaded Binary Trees. Binary Search Tree BST Operations: Insertion Deletion.

Graphs: Basic Concepts Representations of Graphs: Using Linked List and Adjacency Matrix Graph Algorithms. Graph Traversals (BFS & DFS) Applications: Dijkstra's Shortest Path Minimum Spanning Tree Using Prim's Algorithm Warshall's Algorithm

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***Reference Books***

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1. R. S. Salaria- Data Structures and Algorithm-Khanna Publishing
2. G. a. V. Pai Data Structures and Algorithms-2008 TMH
3. Debasis Sarnanta- Classic Data Structures- 2/E PHI2009
4. E. Horowitz Sartaj Sahni and Susan anderson W. H. Freeman -Fundamentals of Data Structures in C
5. Schaum"S Series- Introduction of Data Structure-Prentice Hall of India

## 2MSC (CS) 2-DATABASE MANAGEMENT SYSTEM

L	T	P	C	Theory Paper	Practical Exams	Internal Evaluation	Total Marks
5	0	0	5	80	--	20	100

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### *Course Objectives:*

- Understand the Fundamentals of Data Models and Conceptualize a Database System Using ER Diagram.
- Make a Study of Relational Database Design.
- Know About Data Storage Techniques and Query Processing.
- Impart Knowledge in Transaction Processing Concurrency Control Techniques and Recovery Procedures.
- To Understand MySQL Database Management System.

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### *Course Outcome:*

1. Understand and describe the basic concepts and terminology of Database Management System.
2. Analyze and Design the database of applications using ER modeling and Normalization.
3. Demonstrate the database schema data modeling and normalization process with the help of example.
4. Implement the database design using appropriate database tools.
5. Describe the transaction processing system locking techniques and data recovery.

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Introduction: File Systems Versus Database Systems ,Introduction to Relational Model : Relational Model Concepts, Database Schema, Keys, Relational Operations, Formal Relational Query Languages, Relational Algebra, Relational Calculus, Tuple Relational Calculus, Domain Relational Calculus, Overview of Commercial RDBMS Packages, Database Design, ER Diagram.

#### **UNIT-II**

Normal Forms 1NF, 2NF, 3NF, BCNF, 4NF, 5NF, ACID Property Fundamentals Concurrency Control, Structured Query Language ,SQL Commands DDL, DML, DCL Table Fundamentals, Data Constraints, Computations on Table Data , Operators.

#### **UNIT-III**

Functions, Grouping Data, Sub Queries ,Join , Dynamic SQL , Index, Views, Clusters, Sequence Security Management , OOPs in SQL , Procedural SQL PL/SQL Block Structure, PL/SQL Tables, Cursor Management PL/SQL Transaction PL/SQL Security PLSQL Data Base Objects

#### **UNIT-IV**

Transaction Processing: Transaction Processing Locking Techniques Time Stamp Ordering Validation Techniques Recovery Concepts Shadow Paging Log Based Recovery Database Security Issues Access Control Statistical Database Security

#### **UNIT-V**

Introduction to MySQL , Applications of MySQL, Installing MySQL , MySQL Data Types Running and shutting Down MySQL Server , Making Account , Use Databasesname , Show Database ,show tables , MySQL Connections , Create Database , Drop database , Select database , Creating Tables, Drop Tables ,Inserting data , Select Query , Insert Query, Writing Query

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***Reference Books***

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1. Abraham Silberschatz, Henry Korth, S. Sudarshan, “Database Systems Concepts”, 7<sup>th</sup> Edition, McGraw Hill
2. Ramakrishnan and Gherke, “Database Management Systems”, TMH
3. Rajesh Narang “Database management System” PHI.
4. R. Elmarsi and SB Navathe, “Fundamentals of Database Systems”, Pearson
5. Bipin Desai, “An Introduction to database Systems”, Galgotia Publications.
6. MySQL (4th Edition) 4th Edition by Paul DuBois
7. MySQL(TM): The Complete Reference - The Complete Reference Paperback by Vaswani Vikram)

## 2MSC (CS) 3-COMPUTER NETWORKS

L	T	P	C	Theory Paper	Practical Exams	Internal Evaluation	Total Marks
5	0	0	5	80	--	20	100

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### *Course Objectives:*

1. Build an Understanding of the Fundamental Concepts of Computer Networking.
2. Familiarize the Student with the Basic Taxonomy and Terminology of the Computer Networking Area.
3. Introduce the Student to Advanced Networking Concepts Preparing the Student for Entry Advanced Courses in Computer Networking.

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### *Course Outcome:*

1. Demonstrate the Basic Concepts of Networking Networking Principles Routing Algorithms IP Addressing and Working of Networking Devices.
2. Demonstrate the Significance Purpose and application of Networking Protocols and Standards.
3. Describe compare and contrast LAN WAN MAN Intranet Internet AM FM PM and Various Switching Techniques.
4. Explain the working of Layers and apply the various protocols of OSI & TCP/IP model.
5. Analyze the Requirements for a Given Organizational Structure and Select the Most Appropriate Networking Architecture and Technologies.
6. Design the Network Diagram and Solve the Networking Problems of the Organizations with Consideration of Human and Environment.
7. Install and Configure the Networking Devices.

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Introduction to Computer Networks Types of Network - LAN WAN MAN Internet Network Topologies Transmission Media Communication Mode- Simplex Half Duplex Full Duplex Analog & Digital Signals Base Band Broad Band Error Detection and Correction OSI Model:- Functions of Each Layer Services and Protocols Inter-Networking Devices Hub Repeater Bridge Switch Modem Routers Gateways.

#### **UNIT- II**

Multiplexing Multiplexer FDM TDM Statistical Multiplexing Modulation AM FM PM Switching Technique Message Switching Circuit Switching Packet Switching Virtual Circuit IEEE Standards 802.3 802.4 802.5. Fast Ethernet FDDI Token Ring.

#### **UNIT- III**

Routing Algorithms:- Shortest Path Routing Distance Vector Routing Unicast Routing Multicast Routing Link State Routing Broadcast Routing Congestion Control Traffic Shaping. TCP/IP: Introduction History of TCP/IP Architecture Layers of TCP/IP Comparison Between OSI and TCP/IP Models Transmission Control Protocol User Datagram Protocol Internet Protocol IP Addressing IP Addressing Classes Internet Protocols – IP Packet ARP RARP ICMP

**UNIT- IV**

Various Protocol HTTP Telnet FTP SMTP Mine UDP URL (Uniform Resource Locator) ISDN Channel ISDN Services Base Band ISDN Broadband ISDN Network Security : Network Security Issues Firewalls – Need and Features of Firewalls Types of Firewall Technology- Network Level and Application Level IP Packets Filter Screening Routers Limitations of Firewalls.

**UNIT- V**

Introduction to Wireless Network Fundamentals of Cellular Systems Mobile Ad-Hoc and Sensor Networks Wireless PAN/LAN/MAN Multi-Path Propagation Path Loss Slow Fading Fast Fading Frequency Reuse Cell Splitting Cell Sectoring.

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**Reference Books**

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1. Andrew S.Tanenbaum -Computer Networks Pearson- 4th Edition
2. Behrouz a.Forouzan - Data Communications and Networking -Global Ed - 5th Edition
3. William a Shay - Understanding Data Communications and Networks -Course Technology Inc-3rd Revised Edition
4. Prakash C. Gupta -Data Communications and Computer Networks-PHI-2nd Edition
5. William Stallings- Data and Computer Communications Pearson Education India 10th Edition
6. Larry L.Peterson and Bruce S. Davie-Computer Networks – a Systems Approach- Morgan Kaufmann Publishers- Fifth Edition 2011
7. Thomas D.Nadeau & Ken Gray-Software Defined Networks o'reilly 2013
8. [Http://Nptel.Ac.in/Video.Php?Subjectid=106105081](http://Nptel.Ac.in/Video.Php?Subjectid=106105081)



## 2MSC (CS) 4- OBJECT ORIENTED PROGRAMMING WITH C++

L	T	P	C	Theory Paper	Practical Exams	Internal Evaluation	Total Marks
5	0	0	5	80	--	20	100

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### *Course Objectives:*

- To Understand how C++ Improves C with Object-Oriented Features.
- To Learn how to Write Inline Functions for Efficiency and Performance.
- To Learn the Syntax and Semantics of the C++ Programming Language.
- To Learn how to Design C++ Classes for Code Reuse.
- To Learn how to Implement Copy Constructors and Class Member Functions.
- To Learn how to Overload Functions and Operators in C++.
- To Learn how Containment and Inheritance Promote Code Reuse in C++.
- To Learn how to Use Exception Handling in C++ Programs.

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### *Course Outcomes:*

1. Explain Concepts and Advantages of Object Oriented Programming.
2. Apply and implement the concepts of the Object-Oriented paradigms to analyze design and develop the solutions of real world problems using the Principles of information Hiding Localization and Modularity.
3. Design Develop and maintain the small applications system utility for societal and academic problems using reusability concepts in team spirit.
4. Demonstrate the Advanced Features of C++ Specifically Stream I/O Templates and Operator Overloading and overriding.

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Overview of C++: Object Oriented Programming Concepts Advantages Usage Program Development Environment C++ Language Standards Introduction to Various C++ Compilers C++ Standard Libraries Main Function in C++ Meaning of Empty Argument List Function Prototyping Default Arguments and Argument Matching User Defined Data Types Classes & Objects : Structure Union & Classes Inline Function Scope Resolution Operator Static Class Members: Static Data Member Static Member Function Passing Objects to Function Returning Objects Object Assignment Friend Function Friend Classes

#### **UNIT- II**

Array Pointers References & the Dynamic Allocation Operators: Array of Objects Pointers to Object Type Checking C++ Pointers This Pointer Pointer to Derived Types Pointer to Class Members References: Reference Parameter Call by Reference and Return by Reference Passing References to Objects Returning Reference Independent Reference C++'S Dynamic Allocation Operators Initializing Allocated Memory Allocating Array Allocating Objects. Constructor & Destructor: Introduction Constructor Access Specifiers for Constructors and Instantiation Parameterized Constructor Multiple Constructor in a Class Constructor with Default Argument Copy Constructor Destructor

**UNIT- III**

Overloading as Polymorphism Function & Operator Overloading Function Overloading Overloading Constructor Function Finding the Address of an Overloaded Function Operator Overloading: Creating a Member Operator Function Creating Prefix & Postfix Forms of the Increment & Decrement Operation Overloading the Shorthand Operation (I.E. +=-= etc.) Operator Overloading Restrictions Operator Overloading Using Friend Function Overloading New & Delete Overloading Some Special Operators Overloading [ ] ( ) - Comma Operator Overloading << and. Namespaces: Global Namespace and Namespace Standard Nested Namespaces

**UNIT- IV**

Inheritance: Base Class Access Control Protected Base Class Inheritance Inheriting Multiple Base Classes Constructors Destructors & Inheritance When Constructor & Destructor Function are Executed Passing Parameters to Base Class Constructors Granting Access Virtual Base Classes Virtual Functions & Polymorphism: Virtual Function Pure Virtual Functions Early Vs. Late Binding.

**UNIT- V**

Exception Handling Exception Handling in C++ Try Throw Catch Sequence Multiple Catch Blocks Uncaught Exceptions Catch-All Exception Handler the C++ I/O System Basics: C++ Streams the Basic Stream Classes C++ Predefined Streams Formatted I/O: Formatting Using the IOS Members Setting the Formal Flags Clearing Format Flags an Overloaded Form of Setf() Using Width() Precision() and Fill() Using Manipulators to Format I/O Creating Your Own Manipulators.

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**Reference Books:**

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1. B.S. Gottfried – Programming with C – Schaum's Outline Series – Tata McGraw Hill 2<sup>nd</sup> Edition – 1998.
2. E. Balagurusamy – Programming in C – Tata McGraw Hill 3<sup>rd</sup> Edition– 2004.
3. K.R. Venugopal Sudeep R. Prasad – Programming with C – Tata McGraw Hill - 2002.
4. Yashavant Kanetkar – Let Us C – BPB Publications- 5<sup>th</sup> Edition - 2004.

## 2MSC (CS) 5(A) - MANAGEMENT THEORY AND PRACTICE

L	T	P	C	Theory Paper	Practical Exams	Internal Evaluation	Total Marks
5	0	0	5	80	-	20	100

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### *Course Objectives:*

- Describe the nature and scope of management
- Understand various levels of management
- Describe the various skills that are necessary for successful managers.

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### *Course Outcomes:*

1. Understand and demonstrate the process of planning decision making organizing staffing leading and controlling.
2. Describe Different leadership and Management Styles and Determine to Best Style for Organizational Problems
3. Discuss the Importance of Teamwork within an organization and the elements of effective team dynamics
4. Demonstrate Competence in planning and managing resources people and performance
5. Discuss the role of Planning and controlling

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Management practices- Meaning and Functions Development of Management Thought F.W. Taylor and Herry Fayol's Theories of Management Qualities of an Efficient Management Management Principles of Modern Times (Empowerment Kaizen Quality Circles Total Quality Management.

#### **UNIT-II**

Planning- Plan Policies Strategies and Programs Steps in Planning & Decision Making Forecasting Qualities of an Effective Planner Relevant Case Study

#### **UNIT-III**

Organizing-Organizational Design Organizational Structure Centralization & Decentralization Delegation Gantt chart and PERT/CPM Relevant Case Study

#### **UNIT-IV**

Directing- Motivation and Team Building Theories of Motivation Factors Affecting Motivation. Leadership Leadership Styles Theories of Leadership Qualities of an Effective Leader Effective Communication and Presentation Skills Relevant Case Studies.

#### **UNIT-V**

Controlling Meaning and Basic Principles Types of Controls Budget and Budgetary Control Inventory Control and Quality Control Relevant Case Studies.

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***Reference Books:***

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1. Joseph L. Massie Essentials of Management Prentice Hall of India
2. Biswajeet Patanayak Human Resource Management Prentice Hall of India
3. Gomes-Mejia Balkin & Hardy Managing Human Resource Prentice Hall of India
4. Lesslic W. Rue Llyod Byurs Management Tata Mc Graw hill 2009.
5. Joseph M. Putti Harold Koontz Essentials of Management An Asian Perspective 1998 Tata Mc Graw hill
6. David Boddy-Management: An Introduction Pearson
7. Laurie J. Mullins with Gill Christy-Management & Organisational Behaviour -Pearson

## 2MSC (CS) 5(B)-NUMERICAL METHODS

L	T	P	C	TheoryPaper	Practical Exams	Internal Evaluation	Total Marks
5	0	0	5	80	--	20	100

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### *Course Objectives:*

- To Make the Student's Aware of Need of Numerical Methods
- Cover the Classical Fundamental Topics in Numerical Methods: Approximation Numerical Integration Numerical Linear Algebra Solution of Nonlinear Algebraic Systems and Solution of Ordinary Differential Equations
- To Make Students Aware of Numerical Analysis Software and Computer Facilities

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### *Course Outcomes:*

1. Understand and analyze the real problems and formulate them into linear and non-linear equations
2. Gain the knowledge of various Optimization Techniques for finding the solutions of Non-Linear and Linear Equations.
3. Optimize the solutions by iteratively carrying out Error Analysis for Arithmetic Operations.
4. Understand and explain the Propagation of Errors with the help of Complex Numerical Algorithms.
5. Understand the usage of Interpolation techniques for Numerical Differentiation and Integration.

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Solving Nonlinear Equations- Computer & Arithmetic Errors Method of Bisection the Secant Method Newton- Raphson Method Newton's Method for Polynomial Horner's Method Muller's Method Order of Convergence of Other Method

#### **UNIT-II**

Solving Sets of Equations- Matrix Notation Determinants and Matrix Inversion Norms the Elimination Method Gauss and Gauss-Jordan Method Iterative Method

#### **UNIT-III**

Interpolation - Forward Differences Lagrangian Polynomial Divided Differences for a Polynomial Error of Interpolation Least Square Approximation

#### **UNIT-IV**

Numerical Differentiation and Integration - Derivatives from Difference Table Extrapolation Techniques Newton Cotes Integration Formula ,The Trapezoidal Rule ,The Simpson's Rule

#### **UNIT-V**

Numerical Solution of Ordinary Differential Equations – The Taylor-Series Method Euler and Modified Euler Methods Runge-Kutta Method

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### *Reference Books:*

1. B.S. Grewal -Numerical Methods in Engineering & Science- Khanna Publication Ed. 9th.
2. E. Balagurusamy -Numerical Method-Tata McGraw Hill Publication.
3. S.S. Sastry-Introductory Methods of Numerical Analysis-PHI Learning Pvt. Ltd.
4. F. Gerald Pitrick O-Wheatley.-Applied Numerical Analysis
5. J. Stoer and R. Bulirsch Introduction to Numerical Analysis Springer-Verlag ISBN 0-387-90420-4

## 2MSC (CS) 5(C) - COMPUTERISED ACCOUNTING WITH TALLY

L	T	P	C	Theory Paper	Practical Exams	Internal Evaluation	Total Marks
5	0	0	5	80	--	20	100

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### *Course Objectives:*

- To impart knowledge regarding concepts of Financial Accounting with Tally package
- Learn creating and maintaining of company General Voucher entries Profit & Loss Account Balance Sheets do reconcile bank statement do accrual adjustments and also print financial statements in Tally Package.
- To Learn and practice VAT and GST calculations.
- To make students ready with required skill for employability in the job market.

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### *Course Outcomes:*

1. Explain the basic concepts of Financial Accounting and features of Tally ERP Package
2. Create and maintain the various accounts of the company and prepare & Print Summary Statement of Profit & Loss Account Balance Sheets Bank statement and Adjustments
3. Practice and facilitate companies as Consultant for Income Tax Service Tax VAT and GST.
4. Start up Business by Working as Tally Data Entry Operator & Tax Consultant for different Organizations.

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### *Unit-wise Syllabus :*

#### **UNIT - I**

Tally Configuration & INI setup Data Directory & Folders configuration Single & Multiple User Tally Screen Components Mouse / Keyboard Conventions & Key Combinations Switching between screen areas Quitting Tally. Maintaining Company Data Basic Company Details Create/Alter/Select/Load/Close a Company Chart of Accounts Company Features Configuration.

#### **UNIT – II**

Create Alter & Display Groups and Ledgers All accounting vouchertypes and transactions Create and Alter new Voucher type Item and Account Invoice transactions Excise Invoice Export Invoice Transactions using Bill-wise details Create Alter & Display Cost Centre and Cost Categories Cost centre& Cost Category allocation in voucher entry Creating Cost centreClass Invoice entry in a Class situationCreate Alter & Delete Foreign Currencies Voucher entry using foreign currency Bank Reconciliation Interest calculations using simple &advance parameters Interest calculations on outstanding balances &on invoices Use of voucher class adjustment of interest Creation of voucher class Invoice entry in a class situation.

#### **UNIT – III**

Create Alter & Delete Budgets for groups ledgers & cost centres Defining credit limit & credit period Display Budgets & variances Create Alter & Delete a scenario. Enabling Job Costing in Tally Master creation& configuration for Job costing Creation of Voucher type & Voucher class for Stock Transactions Creation of Transfer journal for transfer of stockbetweengodowns Consumption journal Transactions paymentvoucher Godown summary Report Job Work Analysis Materialconsumptionsummary.Reports like balance sheet Profit & Loss account Ratio analysis TrialBalance.Accounts books like cash/bank book All ledgers Group summary &vouchers Sales purchase & journal registers Cost centre&category summary Cost centre breakup ledger & group

breakup outstanding receivables & payables interest receivable & payable Statistics Cash & Fund flow Day book List of Accounts Reversing journals optional vouchers post-dated vouchers.

#### **UNIT – IV**

Create Alter & Display Stock Groups and Stock Items Stock item behaviour using costing and market valuation method other behaviour like treating all sales as new manufacture treating all purchases as consumed treating all rejections inward as scrap ignoring negative balances Treating difference due to physical counting Create Alter & Display Stock categories Create Alter Display simple & compound units of measures Stock items using alternate units Defining standard cost & selling price Defining Rate of duty Defining MRP Create Alter & Display Godowns Allocation of items to the Godowns All inventory voucher types and transactions Inventory details in accounting vouchers Defining re-order level Transactions using tracking numbers Use of batch-wise details in voucher Additional cost details in vouchers Creating Bill of material Cost estimation Creating Price list & defining Price levels invoice using Price list Zero valued entries Transactions in case of Different actual & billed quantities. Reports like Stock summary Inventory books like Stock item Group summary Stock transfers Physical stock register Movement analysis Stock group & item analysis stock category analysis Ageing analysis Sales order & Purchase order book Statement of inventory related to Godowns categories stock query Reorder status Purchase & Sales order summary Purchase & Sales bill pending Exception reports like negative stock & ledger overdue receivables & payables memorandum vouchers optional vouchers post-dated vouchers reversing journals.

#### **UNIT – V**

Cheque Printing Common printing options Different printing formats Multi-Account printing Dynamic- Report specific options. Creating Group Company Use of Tally vault Using Security control & defining different security levels Use of Tally Audit. Back-up & Restore Splitting company data Export & import of DataODBC compliance use of E-mail Internet publishing Upload web browser & online help Re-write data.

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#### ***REFERENCE BOOKS:***

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1. Nadhani-Implementing Tally 6.3 BPB Publications ISBN:817656494X
2. BPB Tally 6.3 BPB Editorial Board (Hindi) BP Publications ISBN 81-7656-594-6

## PRACTICAL LIST OF TALLY

### Practical Assignment -1

1. Create a Company as “Sagar Industries Ltd.” in Tally with inventory management. and Pass the following Entries :-
  - a. Sagar started “Sagar Industries Ltd.” by bringing Capital Rs.3 00000/- Cash.
  - b. He deposited Rs.1 00000/- cash at ICICI bank.
  - c. He paid electricity bill for Rs.1 200/- by cash.
  - d. He withdrawn Rs.10 000/- cash for his personal use.
  - e. He purchased the following item from Computer Lab. Ltd. on credit with 4% Vat rate.
  - f. Computer - 10 Nos. - @20000/- each
  - g. He sold the following item to Somnath Traders in cash with 4% Vat rate.
  - h. Computer - 5 Nos. - @27500/- each
  - i. He received Rs.6 000/- as commission from Rohit by cash.
  - j. He paid House Rent for Rs.5 000/- by cash.
  - k. He withdrawn Rs.25 000/- cash from ICICI Bank.
  - l. He purchased furniture for Rs.25 000/- by cash for office use.
2. Show the Trial Balance and Balance Sheet of “Sagar Industries Ltd.”
3. Show the Vat Computation report of the above company.
4. Show the Cash Book & Bank Book of the company.
5. Show the Day Book.

### Practical Assignment -2

- i. Jyoti Printers over took all the printing Expenses is of Rs. 1500/-
- ii. Under packing Expenses& from Hariom packing lmt. Rs. 5000/-
- iii. Kashav & brother’s help in fuelling of Rs. 300/-
- iv. Com. open in Bank of India an account with Rs. 100000./-
- v. From Ram lal & son’s 4000/- is to be taken of previous year.
- vi. Under Medicalexponses we purchase Rs. 750/- Medical from Mahima Medical.
- vii. One NANO car of RS.125000/- from TATA Moter’s.
- viii. From M/s R.K. Investment’s we purchase share’s of SAMSUNG. of Rs.7500.
- ix. From Soni Brother’s Gold @ 35000/- is purchased.
- x. From XYZ & son’s Rs. 5000/- is due of previous year.
- xi. Payment is done to Hariom packing lmt. of Rs.3500/-.
- xii. Payment to Kulvinder & Son’s is done of Rs.2700/-
- xiii. Payment to TATA Moter’s is done by D.D. Rs 125000/- which is 1500/- bank commission paid by us.
- xiv. From Arjun Ltd. 7000/- is to be taken of previous year.
- xv. Payment to Soni Brother’s has done by cheque of Rs. 35000/-
- xvi. From XYZ & son’s we received Rs. 5000/-
- xvii. Payment to Jyoti Printer’s has been done by cheque.
- xviii. Payment to Hariom packing lmt. we paid his whole amount by cheque



**Practical Assignment -3****Payment & Receipt Voucher**

- i. Com. has opening cash Rs. 100000/-
- ii. Mr. Rajendra is the owner of the company his opening capital Rs. 200000/-
- iii. Com. has to receive from previous year. {1} VIKAS NAGAR - 75000/- {2} HARISH KUMAR - 75000/-
- iv. Com. paid for full charges Rs. 500/- in cash. 5. Com. purchase chairs in cash Rs. 2000/-.
- v. Com. Received from Harish Kumar Rs. 25000/- in cash.
- vi. Com. purchase packing material of Rs.5000/-
- vii. Paid to Vivek worker 25000/- as a loan.
- viii. Com paid to Vivek worker Rs. 2000/- in cash salary.
- ix. Com. Received from Vikas Nagar 35000/- in cash.
- x. Com. Purchase shares of Tata of Rs. 16000/- in cash.
- xi. Com. paid Building Rent Rs. 35000/- in cash.
- xii. Com. sales in cash Shares of Tata Rs. 26000/- in cash.
- xiii. Paid Mobile bill of Rs. 1250/- in cash.
- xiv. Com. paid water bill Rs. 750/- & Electricity bill Rs. 4500/- in cash.
- xv. Com. Received from Vivek Worker Rs. 25000/- in cash

**Practical Assignment -4**

1. Mr. RAJENDRA KUMAR is owner of the company his Capital opening balance is Rs. - 2524125/-
  1. Company has taken Loan previous year there opening Balance is
    - a). ICICI Bank - 567124/-
    - b). HDFC Bank - 215724/-
  2. Company has to Pay of previous year -
    - a). Kelash Chand & Com. - 500000/-
    - b). Sunjay Singh & Com. - 225000/-
    - c). Singh & Com. - 225000/-
  3. Company has Opening Stock:- ITEM NAME Qun. Rate
    - i. Ashirwad Aata(5kg) 490 50/- Pkt.
    - ii. Ashirwad Aata(10kg) 513 95/- Pkt.
    - iii. Swastik Aata (5kg) 123 51/- Pkt.
    - iv. Swastik Aata (10kg) 50 95/- Pkt.
    - v. Madhushree Tea(50gm) 500 7/- Pkt.
    - vi. Madhushree Tea(100gm) 1000 13.50/- Pkt.
    - vii. Madhushree Tea(250gm) 700 31/- Pkt. 8. Madhushree Tea(500gm) 425 60/- Pkt.
    - viii. Madhushree Tea(1Kg) 200 95/- Pkt. 10. Tata Tea (100gm.) 1000 13/- Pkt
    - ix. Tata Tea(500gm.) 1000 75/- Pkt.
    - x. Zotex(100ml.) 2000 110/- Nos.
    - xi. Spicy Cool(100ml) 300 85/- Nos.
    - xii. Zotex(200ml.) 500 195/- Nos.
    - xiii. Java(50ml.) 200 45/- Nos. 16. Java(100ml.) 300 60/- Nos.
    - xiv. Axe(100ml.) 500 125/- Nos. 18. Axe(200ml.) 200 210/- Nos.
    - xv. Rexsona(100ml.) 1000 135/- Nos.
    - xvi. Rexsona(200ml.) 500 225/- Nos.
    - xvii. Lux Soap(75gm.) 2500 9.75/- Nos.
    - xviii. Lux Soap(100gm.) 1500 14.13/- Nos.
    - xix. Lux Soap(125gm.) 1000 15.50/- Nos.
    - xx. Breez(100gm.) 5000 6.00/- Nos.
    - xxi. Dove Soap(100gm.) 500 21/- Nos.
    - xxii. Dove Soap(200gm.) 500 40/- Nos.
    - xxiii. Pears Soap(100gm.) 225 25/- Nos.

- xxiv. Nia Soap(100gm.) 200 6.50/- Nos.
- xxv. Dabaur Awala(100ml.) 250 17/- Nos.
- xxvi. Dabaur Awala(200ml.) 250 31/- Nos.
- xxvii. Paracute Oil (100ml.) 500 15/- Nos.
- xxviii. Paracute Oil (200ml.) 600 25/- Nos.
- xxix. Shanti Awala(100ml.) 500 15/- Nos.
- xxx. Vatika Hair Oil (100ml.) 250 61/- Nos.
- xxxi. Sunsilk Shempoo(100ml.) 50 20/- Nos.
- xxxii. Sunsilk Shempoo(200ml.) 50 51/- Nos.
- xxxiii. Clinic Plus(100ml.) 100 30/- Nos.....Cont 15
- xxxiv. Clinic All Clear(100ml.) 100 35/- Nos.
- xxxv. Clinic All Clear(200ml.) 100 60/- Nos.
- xxxvi. Chik Shempoo(100ml.) 25 25/- Nos.
- xxxvii. Chik Shempoo(50ml.) 500 13/- Nos.
- xxxviii. Ayur Shempoo(50ml.) 500 15/- Nos
- xxxix. Ayur Shempoo(100ml.) 500 28/- Nos.
- xl. Vatika Shempoo(100ml.) 200 40/- Nos
- xli. Vatika Shempoo(200ml.) 100 70/- Nos.
- xl.ii. Parle-G(100gm.) 5000 3.88/- Pkt.
- xl.iii. Parle-G(250gm.) 2000 12/- Pkt.
- xl. iv. Krack Jack (100gm.) 1000 5.00/- Pkt.
- xl. v. Krack Jack(250gm.) 500 12/- Pkt.
- xl. vi. Fair &Lovely(50gm.) 250 22/- Pkt.
- xl. vii. Ayur Cold Cream(50gm.) 200 30/- Pkt.

4. Company. has some fixed Assets there Opening balance:-
- (i) Maruti Swift - 2 13232/-
  - (ii) Lang & Building - 13 52232/-
  - (iii) Furniture - 500000/-

## 2MSC(CS)6-COMPUTER LAB 2

L	T	P	C	Theory Paper	Internal Evaluation	Practical Exams	Total Marks
0	0	10	5	--	20	80	100

### LIST OF PRACTICALS OF C++

1. Write a Program That Just Outputs `Hello World`
2. Write a Program to Find Maximum and Minimum of Given 3 Numbers.
3. Write a Program That Output Value as Number and as Character.
4. Implementation of the Function That Calculates the Cross Sum of an Integer.(123 as 1+2+3).
5. Determine Number of Characters in a String.
6. Raising a Number N to a Power P is the Same as Multiplying N By Itself P Times. Write a Function Called Power ( ) That Takes a Double Value for N and an INT Value for P and Returns the Result as Double Value. use a Default Argument of 2 for P So That If This Argument is Omitted the Number Will Be Squared. Write a Main ( ) Function That Gets Values from the User to Test This Function.
7. Write a C++ Program to Sort an Array of Integer in Ascending Order Using a Function Called Exchange( ) Which Accepts Two Integer Arguments By Reference.
8. Write a C++ Program to Implement Function Overloading in Order to Compute.
9. Write a C++ Program to Implement Power(MN) Where
  - I) M is Double and N is Int
  - II) M and N are Int.
10. Write a Program That Uses a Structure Called Point to Model a Point. Define Three Points and Have the User Input Values to Two of Them. Then Set the Third Point Equal to the Sum of the Other Two and Display the Value of the New Point. Interaction with the Program Might Look Like This:
 

```
Enter Coordinates for P1: 3 4
Enter Coordinates for P2: 5 7
Coordinates of P1 + P2 are: 8 11
```
11. Create the Equivalent of a Four Function Calculator. the Program Should Request the User to Enter a Number an Operator and Another Number. It Should Then Carry Out the Specified Arithmetical Operation: Adding Subtracting Multiplying Or Dividing the Two Numbers. (It Should use a Switch Statement to Select the Operation). Finally It Should Display the Result. When It Finishes the Calculation the Program Should Ask If the User Wants to Do Another Calculation. the Response Can Be Y Or N. Some Sample Interaction with the Program Might Look Like This.
 

```
Enter First Number Operator Second Number: 10/ 3
Answer = 3.333333
Do Another (Y/ N)? Y
Enter First Number Operator Second Number 12 + 100
Answer = 112
Do Another (Y/ N)? N
```
12. Create a 'Distance' Class with :
  - Feet and Inches as Data Members
  - Member Function to Input Distance
  - Member Function to Output Distance
  - Member Function to Add Two Distance Objects
  - Write a Main Function to Create Objects of Distance Class. Input Two Distances and Output the Sum.
13. Create a Class Called 'Time' That Has
  - Three Integer Data Members for Hours Minutes and Seconds
  - Constructor to Initialize the Object to Zero
  - Constructor to Initialize the Object to Some Constant Value

- Member Function to Add Two Time Objects
  - Member Function to Display Time in Hh:Mm:Ss Format
  - Write a Main Function to Create Two Time Objects Add Them and Display the Result in Hh:Mm:Ss Format.
14. Create a Class Called 'Employee' That Has
- Empcode and Empname as Data Members
  - Member Function Getdata( ) to Input Data
  - Member Function Display( ) to Output Data
  - Write a Main Function to Create Emp an Array of Employee Objects. Accept and
  - Display the Details of At Least 6 Employees.
15. Create a Class Rational Which Represents a Numerical Value by Two Double Values- Numerator& Denominator. Include the Following Public Member Functions: Constructor with No Arguments (Default). Constructor with Two Arguments.
- Void Reduce( ) That Reduces the Rational Number By Eliminating the Highest Common Factor Between the Numerator and Denominator.
  - Overload + Operator to Add Two Rational Number.
  - Overload >> Operator to Enable Input Through Cin.
  - Overload << Operator to Enable Output Through Cout.
  - Write a Main ( ) to Test All the Functions in the Class.
16. Create a Class 'Complex' to Hold a Complex Number. Write a Friend Function to add Two Complex Numbers. Write a Main Function to Add Two Complex Objects.
17. Create a 'Matrix' Class of Size M X N. Overload the '+' Operator to Add Twomatrix Objects. Write a Main Function to Implement It.
18. Create a 'String' Class Which Overloads '=' Operator to Compare Two Stringobjects.
19. Create a Base Class Called 'Shape' Having
- Two Data Members of Type Double.
  - Member Function *Get-Data()* to Initialize Base Class Data Members.
  - Pure Virtual Member Function *Display-Area()* to Compute and Display the Area of the Geometrical Object.
  - Derive Two Specific Classes 'Triangle' and 'Rectangle' from the Base Class.
  - Using These Three Classes Design a Program That Will Accept Dimension of a Triangle/Rectangle Interactively and Display the Area.
20. Consider the Following Class Definition
- ```

Class Father {
Protected: Int Age;
Public;
Father (Int X) {Age = X;}
Virtual Void Iam ( )
{ Cout<< I Am the Father My Age is : << Age<< Endl;}
};

```
- Derive the Two Classes Son and Daughter from the Above Class and for Each Define Iam ( ) to Write Our Similar But Appropriate Messages. You Should Also Define Suitable Constructors for These Classes.
  - Now Write a Main ( ) That Creates Objects of the Three Classes and Then Calls Iam ( ) for Them. Declare Pointer to Father. Successively Assign Addresses of Objects of the Two Derived Classes to This Pointer and in Each Case Call Iam ( ) Through the Pointer to Demonstrate Polymorphism in Action.
21. Write a C++ Program That Displays the Size (in Bytes) of a Given File. The Name ofthe File is specified as Command Line Argument.
22. Design Your Own Manipulator to Provide the Following Output Specification For printing Money Value:
- a. 10 Columns Width
  - b. The Character '\$' At the Beginning
  - c. Two Digits Precision
  - d. Filling of Unused Spaces with ' \* '
  - e. Trailing Zeros Shown

**DBMS LAB**

1. Draw an ER Diagram for University Database.
2. Draw an ER Diagram for Library Management System. Convert it to Tables.
3. Create a Library Management Schema/ Database and Search Anomalies in it.
4. Assume a Video Library Maintains a Database of Movies Rented Out. Without Any Normalization All Information is Stored in One Table as Shown Below.
- 5.

| Full Names   | Physical Address          | Movies Rented                                    | Salutation | Category        |
|--------------|---------------------------|--------------------------------------------------|------------|-----------------|
| Janet Jones  | First Street<br>Plot No 4 | Pirates of the Caribbean<br>Clash of the Titans  | Ms.        | ActionAction    |
| Robert Phill | 3 <sup>rd</sup> Street 34 | Forgetting Sarah Marshal<br>Daddy’s Little Girls | Mr.        | Romance Romance |
| Robert Phill | 5 <sup>th</sup> Avenue    | Clash of the Titans                              | Mr.        | Action          |

6. Normalize the Following Schema with Given Constraints.

Books (Accessionno|isbn Title Author Publisher)

Users (Userid|Name|Deptid|Deptname)

Accessionno ->ISBN

ISBN ->Title

ISBN -> Publisher

ISBN ->Title

Userid -> Name

Userid ->Deptid

Deptid -> Department

7. Compare 3NF and BCNF with Appropriate Example

**Database Query**

8. Give Exercise on DDL and DML.
9. Create a Database Named “School.Mdb” and Perform the Following Tasks Using Ms Access or My SQL
10. Create a Table Named “Studentinfo” Having Following Table Structure.

| Field Name | Data Type     | Structure                   |
|------------|---------------|-----------------------------|
| Class      | Number        |                             |
| Section    | Text          |                             |
| Roll No.   | Number        |                             |
| Name       | Text          | 40 Characters Long          |
| Status     | Lookup Wizard | Two Value:Senior and Junior |
| Photo      | Ole Object    | Photos of Student           |
| Dob        | Date/Time     | Date of Birth of Students   |
| Remarks    | Memo          |                             |

- a. Fill At Least 5 Records.
- b. Prepare a Query to Display All Records and Name Should Be in Ascending Order.
- c. Prepare a Query Named “Senior” to Display Records Including Fields Name Class Sec Rollno Status Photo and Value of “Status” Field Must Be Senior.
- d. Prepare a Form of Above Query “Senior”.
- e. Prepare a Report of All the Fields of Above Table

**Forms and Report**

11. Create a Database Named “Library.Mdb” and Perform the Following Tasks:
12. Create a Table Named “Book” Having Following Structure:

| Field Name | Data Type |
|------------|-----------|
| Bookid     | Text      |
| Bname      | Text      |
| Wname      | Text      |
| Pyear      | Date/Time |
| Pname      | Text      |
| Price      | Currency  |

- a. Add at Least 5 Records.
  - b. Prepare a Query to Display Only Records Including Book Name Writer Name and Publication Name. Save the Query as “Q\_Book”.
  - c. Prepare a Query to Display All Records On the Basis of Price which is More Than Rs500.
  - d. Prepare a Form On the Basis of Table.
  - e. Prepare a Report On the Basis of Query Named "Q\_Book”.
13. Create Tables According to the following Definition.

```
CREATE TABLE DEPOSIT (ACTNO VARCHAR2(5) CNAME VARCHAR2(18)
BNAME VARCHAR2(18) AMOUNT NUMBER(82) ADATE DATE); CREATE TABLE
BRANCH(BNAME VARCHAR2(18)CITY VARCHAR2(18)); CREATE TABLE
CUSTOMERS(CNAME VARCHAR2(19) CITY VARCHAR2(18)); CREATE TABLE
BORROW(LOANNO VARCHAR2(5) CNAME VARCHAR2(18)
BNAMEVARCHAR2(18) AMOUNT NUMBER (82));
```

- i. Insert the data as shown below.

### Deposit

| ACTNO | CNAME   | BNAME       | AMOUNT  | ADATE     |
|-------|---------|-------------|---------|-----------|
| 100   | ANIL    | VRCE        | 1000.00 | 1-MAR-95  |
| 101   | SUNIL   | AJNI        | 5000.00 | 4-JAN-96  |
| 102   | MEHUL   | KAROLBAGH   | 3500.00 | 17-NOV-95 |
| 104   | MADHURI | CHANDI      | 1200.00 | 17-DEC-95 |
| 105   | PRMOD   | M.G.ROAD    | 3000.00 | 27-MAR-96 |
| 106   | SANDIP  | ANDHERI     | 2000.00 | 31-MAR-96 |
| 107   | SHIVANI | VIRAR       | 1000.00 | 5-SEP-95  |
| 108   | KRANTI  | NEHRU PLACE | 5000.00 | 2-JUL-95  |
| 109   | MINU    | POWAI       | 7000.00 | 10-AUG-95 |

### Branch

|             |          |
|-------------|----------|
| VRCE        | NAGPUR   |
| AJNI        | NAGPUR   |
| KAROLBAGH   | DELHI    |
| CHANDI      | DELHI    |
| DHARAMPETH  | NAGPUR   |
| M.G.ROAD    | BANGLORE |
| ANDHERI     | BOMBAY   |
| VIRAR       | BOMBAY   |
| NEHRU PLACE | DELHI    |
| POWAI       | BOMBAY   |

### Customers

|         |          |
|---------|----------|
| ANIL    | CALCUTTA |
| SUNIL   | DELHI    |
| MEHUL   | BARODA   |
| MANDAR  | PATNA    |
| MADHURI | NAGPUR   |
| PRAMOD  | NAGPUR   |
| SANDIP  | SURAT    |
| SHIVANI | BOMBAY   |
| KRANTI  | BOMBAY   |
| NAREN   | BOMBAY   |

**Borrow**

| LOANNO | CNAME   | BNAME       | AMOUNT  |
|--------|---------|-------------|---------|
| 201    | ANIL    | VRCE        | 1000.00 |
| 206    | MEHUL   | AJNI        | 5000.00 |
| 311    | SUNIL   | DHARAMPETH  | 3000.00 |
| 321    | MADHURI | ANDHERI     | 2000.00 |
| 375    | PRAMOD  | VIRAR       | 8000.00 |
| 481    | KRANTI  | NEHRU PLACE | 3000.00 |

- ii. From the above given tables perform the following queries:
- Describe deposit branch.
  - Describe borrow customers.
  - List all data from table DEPOSIT.
  - List all data from table BORROW.
  - List all data from table CUSTOMERS.
  - List all data from table BRANCH.
  - Give account no and amount of depositors.
  - Give name of depositors having amount greater than 4000.
  - Give name of customers who opened account after date '1-12-96'.

14. Create the below given table and insert the data accordingly.

- a. Create Table Job (job\_id job\_title min\_sal max\_sal)

| COLUMN NAME | DATA TYPE    |
|-------------|--------------|
| job_id      | Varchar2(15) |
| job_title   | Varchar2(30) |
| Min_sal     | Number(72)   |
| max_sal     | Number(72)   |

- b. Create table Employee (emp\_no emp\_name emp\_sal emp\_comm dept\_no)

| COLUMN NAME | DATA TYPE    |
|-------------|--------------|
| Emp_no      | Number(3)    |
| Emp_name    | Varchar2(30) |
| Emp_sal     | Number(82)   |
| Emp_comm    | Number(61)   |
| dept_no     | Number(3)    |

- c. Create table deposit (a\_no cname bname amount a\_date).

| COLUMN NAME | DATA TYPE    |
|-------------|--------------|
| a_no        | Varchar2(5)  |
| cname       | Varchar2(15) |
| bname       | Varchar2(10) |
| amount      | Number(72)   |
| a_date      | Date         |

- d. Create table borrow(loanno cname bname amount)

| COLUMN NAME | DATA TYPE    |
|-------------|--------------|
| loanno      | Varchar2(5)  |
| cname       | Varchar2(15) |
| bname       | Varchar2(10) |
| amount      | Varchar2(72) |

- d. Insert following values in the table Employee.

| Emp_no | emp_name | emp_sal | Emp_comm | Dept_no |
|--------|----------|---------|----------|---------|
| 101    | Smith    | 800     |          | 20      |
| 102    | Snehal   | 1600    | 300      | 25      |
| 103    | Adama    | 1100    | 0        | 20      |
| 104    | Aman     | 3000    |          | 15      |
| 105    | Anita    | 5000    | 50000    | 10      |
| 106    | Sneha    | 2450    | 24500    | 10      |
| 107    | Anamika  | 2975    |          | 30      |

- e. Insert following values in the table job.

| job_id   | job_name          | min_sal | max_sal |
|----------|-------------------|---------|---------|
| IT_PROG  | Programmer        | 4000    | 10000   |
| MK_MGR   | Marketing manager | 9000    | 15000   |
| F1_MGR   | Finance manager   | 8200    | 12000   |
| F1_ACC   | Account           | 4200    | 9000    |
| LEC      | Lecturer          | 6000    | 17000   |
| COM_P_OP | Computer Operator | 1500    | 3000    |



g. Insert following values in the table **deposit**

| A_no | ename | Bname      | Amount | date      |
|------|-------|------------|--------|-----------|
| 101  | Anil  | andheri    | 7000   | 01-jan-06 |
| 102  | Sunil | Virar      | 5000   | 15-jul-06 |
| 103  | jay   | villeparle | 6500   | 12-mar-06 |
| 104  | vijay | andheri    | 8000   | 17-sep-06 |
| 105  | keyur | dadar      | 7500   | 19-nov-06 |
| 106  | mayur | Borivali   | 5500   | 21-dec-06 |

Perform following queries

- i. Retrieve all data from employee jobs and deposit.
  - ii. Give details of account no. and deposited rupees of customers having account opened between dates 01-01-06 and 25-07-06.
  - iii. Display all jobs with minimum salary is greater than 4000.
  - iv. Display name and salary of employee whose department no is 20. Give alias name to name of employee.
  - v. Display employee noname and department details of those employee whose department lies in( 1020)
14. To study various options of LIKE predicate
- i. Display all employee whose name start with 'A' and third character is ' a'.
  - ii. Display name number and salary of those employees whose name is 5 characters long and first three characters are 'Ani'
  - iii. Display the non-null values of employees and also employee name second character should be 'n' and string should be 5 characters long.
  - iv. Display the null values of employee and also employee name's third character should be "a"
  - v. What will be output if you are giving LIKE predicate as '%\\_%' ESCAPE 'V'
15. To perform various data manipulation commands aggregate functions and sorting concept on all created tables.
- i. List total deposit from deposit.
  - ii. List total loan from karolbagh branch
  - iii. Give maximum loan from branch vrce.
  - iv. Count total number of customers
  - v. Count total number of customer's cities.
  - vi. Create table supplier from employee with all the columns.
  - vii. Create table supl from employee with first two columns.
  - viii. Create table sup2 from employee with no data
  - ix. Insert the data into sup2 from employee whose second character should be 'n' and string should be 5 characters long in employee name field.
  - x. Delete all the rows from supl.
  - xi. Delete the detail of supplier whose sup no is 103.
  - xii. Rename the table sup2.
  - xiii. Destroy table sup 1 with all the data.
  - xiv. Update the value dept no to 10 where second character of emp. name is 'm'.
  - xv. Update the value of employee name whose employee number is 103.

16. To study Single-row functions.

- i. Write a query to display the current date. Label the column Date
- ii. For each employee display the employee number job salary and salary increased by 15% and expressed as a whole number. Label the column New Salary
- iii. Modify your query no 4. (2) to add a column that subtracts the old salary from the new salary. Label the column Increase
- iv. Write a query that displays the employee's names with the first letter capitalized and all other letters lowercase and the length of the names for all employees whose name starts with J A or M. Give each column an appropriate label. Sort the results by the employees' last names.
- v. Write a query that produces the following for each employee: <employee last name> earns <salary> monthly
- vi. Display the name hire date number of months employed and day of the week on which the employee has started. Order the results by the day of the week starting with Monday.
- vii. Display the hiredate of emp in a format that appears as Seventh of June 1994 12:00:00 AM.
- viii. Write a query to calculate the annual compensation of all employees (sal+comm.).

17. Displaying data from Multiple Tables (join)

- i. Give details of customers ANIL.
- ii. Give name of customer who are borrowers and depositors and having living city Nagpur
- iii. Give city as their city name of customers having same living branch.
- iv. Write a query to display the last name department number and department name for all employees.
- v. Create a unique listing of all jobs that are in department 30. Include the location of the department in the output
- vi. Write a query to display the employee name department number and department name for all employees who work in NEW YORK.
- vii. Display the employee last name and employee number along with their manager's last name and manager number. Label the columns Employee Emp# Manager and Mgr# respectively.
- viii. Create a query to display the name and hire date of any employee hired after employee SCOTT.

18. To apply the concept of Aggregating Data using Group functions.

- i. List total deposit of customer having account date after 1-jan-96.
- ii. List total deposit of customers living in city Nagpur.
- iii. List maximum deposit of customers living in bombay.
- iv. Display the highest lowest sum and average salary of all employees. Label the columns Maximum Minimum Sum and Average respectively. Round your results to the nearest whole number.
- v. Write a query that displays the difference between the highest and lowest salaries. Label the column DIFFERENCE.
- vi. Create a query that will display the total number of employees and of that total the number of employees hired in 1995 1996 1997 and 1998
- vii. Find the average salaries for each department without displaying the respective department numbers.
- viii. Write a query to display the total salary being paid to each job title within each department.
- ix. Find the average salaries > 2000 for each department without displaying the respective department numbers.
- x. Display the job and total salary for each job with a total salary amount exceeding 3000 in which excludes president and sorts the list by the total salary.
- xi. List the branches having sum of deposit more than 5000 and located in city Bombay.

19. To solve queries using the concept of sub query.

- i. Write a query to display the last name and hire date of any employee in the same department as SCOTT. Exclude SCOTT
- ii. Give name of customers who are depositors having same branch city of mr. sunil.
- iii. Give deposit details and loan details of customer in same city where pramod is living.
- iv. Create a query to display the employee numbers and last names of all employees who earn more than the average salary. Sort the results in ascending order of salary.
- v. Give names of depositors having same living city as mr. anil and having deposit amount greater than 2000
- vi. Display the last name and salary of every employee who reports to ford.
- vii. Display the department number name and job for every employee in the Accounting department.
- viii. List the name of branch having highest number of depositors.
- ix. Give the name of cities where in which the maximum numbers of branches are located.
- x. Give name of customers living in same city where maximum depositors are located.

20. Manipulating Data

- i. Give 10% interest to all depositors.
- ii. Give 10% interest to all depositors having branch vree
- iii. Give 10% interest to all depositors living in nagpur and having branch city Bombay.
- iv. Write a query which changes the department number of all employees with empno 7788's job to employee 7844's current department number.
- v. Transfer 10 Rs from account of anil to sunil if both are having same branch.
- vi. Give 100 Rs more to all depositors if they are maximum depositors in their respective branch.
- vii. Delete depositors of branches having number of customers between 1 to 3.
- viii. Delete deposit of vijay.
- ix. Delete borrower of branches having average loan less than 1000.

### Data Structure Lab

1. Program to Maintain a Linked List.
2. Program to Add a New Node to the Ascending Order Linked List.
3. Program to Maintain a Doubly Linked List.
4. Program to Implement Stack as an Array.
5. Program to Implement Stack as a Linked List.
6. Program to convert an a.E. from Infix Form to Postfix Form.
7. Program to Evaluate an Expression Entered in Postfix Form.
8. Program to Implement Non-Recursive Function for Factorial of a Number.
9. Program to Implement Recursive Function for Factorial of a Number.
10. Program to Implement a Queue as an Array.
11. Program to Implement a Queue as a Linked List.
12. Program to Implement a Circular Queue as an Array.
13. Program to Implement a Circular Queue as a Linked List.
14. Program to Implement a Dequeue Using an Array.
15. Program to Implement Linear Search in an Unsorted Array.
16. Program to Implement Binary Search in a Sorted Array.
17. Program to Implement Selection Sort.
18. Program to Implement Insertion Sort (the Program Should Report the Number of Comparisons).
19. Program to Implement Bubble Sort.
20. Program to Implement Quick Sort.

**SEMESTER III****3MSC (CS)1 - WEB TECHNOLOGY**

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

**Course Objectives:**

- Learn How to Design and Develop a Web Page Using HTML and CSS
- Learn How to Link Pages So that they Create a Web Site.
- Design and Develop a Web Site Using Text Images Links Lists and Tables for Navigation and Layout.
- Style Your Page Using CSS Internal Style Sheets and External Style Sheets.
- Learn to use JavaScript & XML in Web Design.
- Learn How to use Database in Web Design.

**Course Outcome:**

1. Describe the concepts of WWW including Browser and HTTP Protocol.
2. List the Various HTML Tags and use them to develop the User Friendly Web Pages.
3. Define the CSS with its Types and use them to provide the Styles to the Web Pages at Various Levels.
4. Develop the Modern Web Pages using the HTML and CSS Features with different layouts as per Need of Applications.
5. Use the Javascript to develop the dynamic Web Pages.
6. Use Server Side Scripting with PHP to Generate the Web Pages dynamically using the Database Connectivity.
7. Develop the Modern Web Applications using the Client and Server Side Technologies and the Web Design Fundamentals.

**Unit-wise Syllabus :****UNIT-I**

Introduction to Web Web Designing and Website Planning :concept of WWW Internet and WWW HTTP Protocol : Request and Response Web Browser and Web Servers Website Hosting-Free Vs. Paid Linux Vs. Windows Hosting Concepts & use of Database & Mail Servers Associated with Web Sites Features of Web 2.0 Concepts of Effective Web Design Web Design Issues Including Browser Bandwidth and Cache Display Resolution Look and Feel of the Website Page Layout and Linking User Centric Design Sitemap Planning and Publishing Website Designing Effective Navigation. Website Hosting Issues C panel and FTP.

**UNIT-II**

Web Development with HTML : Basics of HTML Formatting and Fonts Commenting Code Color Hyperlink Lists Tables Images Forms Meta Tags Character Entities Frames and Frame Sets Browser Architecture and Web Site Structure. Overview and Features of HTML5 use of HTML Code Editor & WYSIWYG Editor.

Cascading Style Sheets (CSS): Style Sheets : Need for CSS Introduction to CSS Basic Syntax and Structure Using CSS Background Images Colors and Properties Manipulating Texts Using Fonts

Borders and Boxes Margins Padding Lists Positioning Using CSS CSS2 Overview and Features of CSS3

### **UNIT-III**

Technologies for Web Applications Javascript & XML: Javascript : Client Side Scripting with Javascript Variables Functions Conditions Loops and Repetition Pop Up Boxes Advance Javascript: Javascript and Objects Javascript Own Objects the Dom and Web Browser Environments Manipulation Using Dom Forms and Validations DHTML : Combining HTML, CSS and Javascript Events and Buttons. XML : Introduction of XML Validation of XML Documents DTD Ways to use XML, XML for Data Files Html Vs XML Embedding XML into HTML Documents Converting XML to HTML for Display Displaying XML Using CSS and XSL Rewriting HTML as XML Relationship Between HTML SGML and XML Web Personalization Semantic Web Semantic Web Services. Transforming XML Using XSL and XSLT

### **UNIT-IV**

Web Design with PHP : Introduction and Basic Syntax of PHP Decision and Looping with Examples PHP and HTML Arrays Functions Browser Control and Detection String Form Processing Files Advance Features: Cookies and Sessions Object Oriented Programming with PHP

### **UNIT-V**

Introduction to Database Driven Websites with PHP: PHP and MYSQL: Basic Commands with PHP Examples Connection to Server Creating Database Selecting a Database Listing Database Listing Table Names Creating a Table Inserting Data Altering Tables Queries Deleting Database Deleting Data and Tables PHP Myadmin and Database Bugs  
Introduction to Search Engine Types of Search Engine Working Process of Search Engine Introduction Search Engine Optimization Need of Search Engine Optimization Search Engine Optimization Process.

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### **Reference Books:**

1. Roger S.Pressman David Lowe “Web Engineering” Tata McGraw Hill Publication 2007
2. Achyut S Godbole and Atul Kahate “Web Technologies” Tata McGraw Hill
3. Gopalan N P Akilandeswari “Web Technology: a Developer S Perspective” PHI
4. Chris Bates Web Programming :Building Internet Applications Wiley
5. C. Xavier “Web Technology &Design” Tata McGraw Hill.
6. Ivan Bay Ross “HTML DHTML Java Script Perl CGI” BPB.
7. Ralph Moseley and M. T. Savaliya-Developing Web Applications Wiley-India
8. Web Technologies Black Book Dreamtech Press
9. HTML 5 Black Book Dreamtech Press
10. Joel Sklar- Web Design Cengage Learning
11. Harwani-Developing Web Applications in PHP and Ajax Mcgrawhill
12. P.J. Deitel & H.M. Deitel - Internet and World Wide Web How to Program Pearson

### **List of Open Source Software/Learning Website:**

- Browsers Like Ie Mozilla Firefox etc.
- Server Software Xampp/Wamp/Lamp
- [Www.Apachefriends.Org](http://www.Apachefriends.Org)
- [Www.W3.Org](http://www.W3.Org)
- [Www.w3schools.Com](http://www.w3schools.Com)
- [Www.Php.Net](http://www.Php.Net)
- [Www.MySql.Com](http://www.MySql.Com)
- [Www.Phpmyadmin.Net](http://www.Phpmyadmin.Net)

## 3MSC (CS) 2– SOFTWARE ENGINEERING

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

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### *Course Objectives:*

- Understand Learn and Apply the Theoretical and Practical Knowledge of Software Development Such as Software Development Paradigms Process Models Tools and Techniques.
- Understand and Learn the Process of Software Requirements Identification Analysis Review and Learn Recording Requirements in the IEEE Format of the SRS Document.
- Understand the Various Types and Levels of Software Testing and Basic Approaches of Test Case Designing.
- Gain the Knowledge of the Various Models of Software Quality Estimation Quality Assurance and Control.

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### *Course Outcomes:*

1. Identify Analyze Review and Validate the Requirement of Software Components and System and Also Prepare Software Requirement Specification (SRS) Document Using Relevant Standards Tools and Methodologies.
2. Manage a Software Project by Applying Project Management Concepts Such as Planning Scheduling and Risk Management for Developing Qualitative and Economic Software.
3. Work Effectively in Various Profiles of Software Developing Team Such as Software Analyst Architecture Programmer Tester Quality Assurance and Control officer Project Manager and Leaders.
4. Communicate and Coordinate Competently by Listening Speaking Reading and Writing Software Documents
5. Apply Coding Standards & Guidelines and Quality Norms in Coding of Software Systems to Satisfy the Requirements and Quality.
6. Design Test Cases and Optimize the Test Suite for Unit Integration and System-Level Testing Using Various Techniques and Tools for Adequately Testing the Software Components and Systems.

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Software: Software Characteristics Components and Applications Software Engineering a Layered Technology Software Development Life Cycle Software Process Models- Linear Sequential Model Prototype & RAD Model Incremental and Evolutionary Process Models. Introduction of Agile Software Development

#### **UNIT-II**

Analysis Concept and Principles: Requirement Analysis Analysis Principles Requirement Elicitation Information Gathering Techniques Requirements Specification Requirements Verification and Validation Requirements Management. Documenting Software Requirement Specification (SRS) Characteristics of SRS Format of SRS Software Project Planning: Objectives Decomposition Techniques and Empirical Estimation Models. Project Metrics: Software Measurement–Size Oriented Function Oriented Metrics.

### **UNIT-III**

Design Concepts and Principles: Design Process Design Concepts Design Principles Effective Modular Design Human Computer Interface Design Interface Design Guidelines. System Design: Design Models for Architecture Component Data and User Interfaces; Problem Partitioning Abstraction Cohesiveness Coupling Top Down and Bottom Up Design Approaches; Functional Versus Object Oriented Approach Design Specification. Coding: Top-Down and Bottom-Up Structure Programming Information Hiding Programming Style and Internal Documentation Verification.

### **UNIT-IV**

Software Testing: White and Black Box Testing Levels of Testing UNIT Integration System Testing Functional Testing Structural Testing Test Plan Software Testing Strategies Verification & Validation Incremental & Non-Incremental Testing Top Down and Bottom Up Integration Testing Alpha & Beta Testing White Box and Black Box Testing Techniques Debugging Techniques. Software Quality Quality Models Quality Control and Quality Assurance ISO SEI Capability Maturity Model (CMM) and Comparison between ISO& SEI CMM.

### **UNIT-V**

Software Maintenance Need and Categories of Maintenance Software Configuration Management Software Reverse and Reengineering Models S/W Reuse Benefits of S/W Reuse Reuse Process Classification and Retrieving Components Economics of S/W Reuse Case : Introducing to Case Taxonomy of Case Tools Case and its Scope Case Support in Software Life Cycle Documentation Support Architecture of Case Environment.

---

### ***Reference Books:***

1. Roger S. Pressman Software Engineering-a Practitioner's Approach McGraw Hill International Edition
2. K. K. Aggarwal Yogesh Singh Software Engineering
3. Ian Sommerville- Software Engineering Addison-Wesley Publishing Company
4. James F. Peter Software Engineering - an Engineering Approach John Wiley
5. Fairley Richard Software Engineering Concepts Tata McGraw Hill

## 3MSC (CS) 3-OPERATING SYSTEM

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

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### *Course Objectives:*

- Understand the Services provided by Operating System
- Understand the Working and Organization of Process and its Scheduling and Synchronization.
- Understand Different Approaches of Memory Management Techniques.
- Understand the Structure and Organization of the File System.

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### *Course Outcomes:*

1. Identify and describe the Services Provided by Operating Systems.
2. Understand and Solve the Problems Involving Process Control Mutual Exclusion Synchronization and Deadlock.
3. Apply Various Approaches of Memory Management
4. Analyze Various Operating System Approaches in Linux and Windows

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### *Unit-wise Syllabus :*

#### **UNIT- I**

Definitions Components and Types of Operating System Operating System Services System Calls System Programs Process Concepts Process State & Process Control Block Process Scheduling Scheduling Criteria Scheduling Algorithms Multiple-Processor Scheduling Real-Time Scheduling Threads Introduction

#### **UNIT-II**

The Critical Sections Problem Semaphores Classical Problem of Synchronization Deadlock Characterizations Method for Handling Deadlocks Deadlock Prevention Deadlock Avoidance Deadlock Detection Recovery from Deadlock Combined Approach to Deadlock

#### **UNIT-III**

Storage Management Logical Versus Physical Address Space Swapping Contiguous Allocating Paging Segmentation Virtual Memory Demand Paging Performance of Demand Paging Page Replacement Page Replacement Algorithms Thrashing Demand Segmentation

#### **UNIT-IV**

Disk Structure Disk Scheduling Disk Management Swap Space Management Disk Reliability Stable Storage Implementation File Concepts Directory Structure Protecting I/O Subsystem Overview I/O Hardware Application I/O Interface Kernel I/O Subsystem

#### **UNIT-V**

Case Studies: Linux System: History Components Kernel Modules Process Management – Model Identity Context Scheduling – Kernel Synchronization Process Scheduling Memory Management of Physical Memory Windows 2000 System: History Design Principal Components

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### *Reference Books:*

1. Silberschatz Galvin Gagne -Operating System Concepts Wiley Student Edition
2. Milan Milenkovic Operating System Concepts & Design-TMH Publication
3. Andrew S. Tanenbaum -Modern Operating System PHI



## 3MSC (CS) 4– JAVA PROGRAMMING

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

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### *Course Objectives:*

- Introduce and Learn the Usage of the Java SDK Environment to Create Debug and Run Java Programs.
- Understand Fundamentals of Java Programming Such as Character Set Variables Data Types and Control Structures Array Class and Methods etc.
- Understand the Concepts of OOPs and Learn Implementation of them in Java by Defining Classes Invoking Methods using Class Libraries.
- Introduce Strings Vectors Interfaces Packages and Threads Handling in Java.
- Gain the Knowledge of Java Applets AWT Swings Servlet.
- Learn and Understand the GUI Application Web Applications N-Tier Architecture.
- Develop the Understandings of the Basic Knowledge of File Handling Database Connectivity Java Servlets and Web Application.

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### *Course Outcomes:*

1. Explain and apply the Object Oriented Concepts for Solving Real Problem.
2. Use the Java SDK Environment to Create Debug and Run Simple Java Programs.
3. Apply Java Technology to Develop the Small Applications Utilities and Web Applications.
4. Apply Event Management and Layout Managers Using AWT Swing JDBC and Servlet for Developing the Software for Various Problems.

---

### *Unit-wise Syllabus :*

#### **UNIT-I**

Basics of Java : History and Basics of Java Java Environment JDK Tools Java Virtual Machine Java Program Structure Java Language- Tokens Keywords Constants Variables and Data Types. Operators and Expressions Statements - Decision Making Branching and Looping Labeled Loops Statement Jump Statements: Break Continue and Return Command Line Argument.

#### **UNIT-II**

Classes and Objects: Classes Objects Defining a Class Adding Variables and Methods Creating Objects Accessing Class Members Constructors Static Members Nesting of Methods Inheritance and Polymorphism: Basics Types Extending a Class Using Super Method Overloading Method Overriding Final Variables and Methods Final Classes Finalize Method Abstract Methods and Classes Visibility Control.

#### **UNIT-III**

One and Two Dimension Arrays String Array String and String Buffer Classes Vectors Wrapper Classes, Interfaces: Defining Interfaces Extending Interfaces Implementing Interfaces Accessing Interface Variables Packages: System Packages Naming Conventions Creating Packages Accessing a Package Using Package Adding a Class to a Package Hiding Classes, Exception Handling: Introduction to Exception Handling Try-Catch Finally Throws Throw, Java Thread Model: Life Cycle of a Thread Thread Class Runnable Interface

#### **UNIT-IV**

Applet Programming : Creating and Executing Java Applets Inserting Applets in a Web Page Applet Tag Local and Remote Applets Applets Vs. Applications Applets Life Cycle. AWT Classes Swing Classes Event Handling AWT Programming: Working with Windows Graphics and Text Using AWT Controls Layout Managers and Menus Handling Image Animation Sound and Video. Java Swing: Japplet Icons and Labels Text Fields Buttons Radio Buttons Check Boxes Combo Boxes List Boxes Tabbed and Scroll Panes Tables. Event Handling:

#### **UNIT-V**

I/O Stream : Introduction of I/O Stream Types of Streams Stream Class Hierarchy Using File Class Byte Streams Vs Character Streams Textfile Vs Binary File Standard I/O Streams and Random Access File Serialization.

Database Programming Using JDBC:-Introduction to JDBC JDBC Drivers Types of JDBC Drivers Connecting with Database.

J2EE: Introduction of J2EE Web Application Basics Architecture and Challenges of Web Application Servlet Servlet Life Cycle Developing and Deploying Servlets.

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#### ***Reference Books:***

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1. E. Balagurusamy "Programming with Java a Primer"TMH ISBN-13: 978-0-07-061713-1 Isbn-10: 0-07-061713-9.
2. Patrick Naughton and Herbert Schildt "Java: the Complete Reference" TMH Publication ISBN 0-07-463769-X.
3. Yashavantkanetkar "Let us Java" BPB Publications.
4. Ivan Bayross "Web Enabled Commercial Application Development Using HTML DHTML Javascript Perl CGI" BPB Publications
5. Cay Horstmann "Big Java" Wiley Publication
6. Peter Norton "Java Programming" Techmedia Publications.
7. Joseph Weber "Using Java 1.2" PHI Isbn-81-203-1558-8.

## 3MSC (CS) 5(A) - MULTIMEDIA APPLICATIONS

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

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### *Course Objectives:*

- To Provide Students with the Basic Understanding of Multimedia Systems and its Components.
- To Provide Information about the Standard Tools and Techniques used in Development of Multimedia Components for Productions
- To Create Simple Multimedia Applications and Products for using Standalone Networked or Web Based Computers.

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### *Course Outcomes:*

1. Develop Understanding of Technical Aspect of Multimedia Systems.
2. Understand and explain the storage mechanism and applicability of Various File Formats for Audio Video and Text Media.
3. Develop Various Multimedia Systems Applicable in Real Time.
4. Create a Multimedia Component Using Various Tools and Techniques.
5. Apply the Guidelines and Standards of Multimedia Systems and to analyze the performance of Multimedia System.

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Introduction to Multimedia, Needs and Areas of use Development Platforms for Multimedia Identifying Multimedia Elements Text Images Sound Animation and Video Making Simple Multimedia with PowerPoint.

Concepts of Plain & Formatted Text RTF & HTML Texts Using Common Text Preparation Tools Conversion to and from of Various Text Formats Using Standard Software Object Linking and Embedding Concept.

#### **UNIT-II**

Sound - Sound and its Attributes Sound and its Effects in Multimedia Frequency Sound Depth Channels and its Effects on Quality and Storage Size Estimation of Space of a Sound File Sound Card Standard – FM Synthesis Cards Waves Table Cards Midi and MP3 Files and Devices 3D Sounds Recording and Editing Sound Using Sound Editors Like Audacity Sound Forge etc.

Importance of Images Graphics in Multimedia Vector and Raster Graphics Regular Graphics Vs. Interlaced Graphics Image Capturing Methods - Scanner Digital Camera etc. Color Models-RGB CYMK HUE Saturation and Brightness Various Attributes of Images Size Color Depth etc Various Image File Format BMP DIB CIF PIC and TIF Format Their Features and Limitations Image Format Conversion Various Effects on Images, Create Images Using Photoshop CorelDraw and Apply Various Effects Using Layers Channels and Masks in Images.

### **UNIT-III**

Video- Basic of Video Analog and Digital Video Type of Video Digitization of Analog Video Video Standard – NTSC PAL HDTV Video Capturing Media /Instruments Videodisk Camcorder Compression Techniques File Formats AVI JPG MPEG Video Editing and Movie Making Tools Converting Formats of Videos Recording and Editing Videos Using Video Editing Software Like Adobe Premiere or Sony Vegas.

### **UNIT-IV**

Animation and its Basic – Principals of Animation and its use in Multimedia Computer System Configuration and Peripherals Requirements Software for Animation Effects of Resolution Pixel Depth Image Size on Quality and Storage Types of Animation and Applications.

Authoring Tools for Multimedia – Introduction to Various Types of Multimedia Authoring Tools CD/DVD Based and Web Based Tools Features and Limitations Creating Multimedia Package Using All Components.

### **UNIT-V**

Introduction to Virtual Reality and its Applications Virtual Reality Terminology Head Mounts Display (HMD) Boom Cave Input Devices and Sensual Technology Characteristic If Immersive vs. Shared Augmented and Mixed Reality

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#### ***Reference Books:***

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1. Ramesh Bangia -Introduction to Multimedia Laxmi Publications Pvt. Ltd.
2. Tay Vaughan -Multimedia: Making It Work -Tata Mc-Graw Hill.
3. Bhatnager G. Elsevier-Introduction to Multimedia Systems
4. Satish Jain-Introduction to Multimedia (M4.2-R4)-BPB Publications

### 3MSC (CS) 5(B)-DATA WAREHOUSING & MINING

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

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#### *Course Objectives:*

- Introduce the Basic Concepts of DataBase Data Warehouse and Data Mining
- Understand the Concept of Knowledge Discovery
- Understand the process of deriving Information from data with Different Perspectives
- Understand and apply Preprocessing Methods On Raw Data
- Discover Interesting and useful Patterns and associations Analyze Supervised and Unsupervised Models
- Understand the concept of Business Intelligence and different types of databases.

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#### *Course Outcome:*

1. Demonstrate an Understanding and knowledge of the Data Warehousing Data Mining and Business Intelligence
2. Explain the Data Analysis and Knowledge Delivery Stages.
3. Organize and Prepare the Data Needed for Data Mining Using Pre Preprocessing Techniques
4. Implement the Appropriate Data Mining Methods Like Association Classification Clustering
5. Apply Data Mining Methods to Solve Practical Problems. (Analyze the Problem Domain Data Collection Preprocessing Apply Suitable Data Mining Method Interpret and Visualize the Results and Provide Decision Support.)

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#### *Unit-wise Syllabus :*

##### **UNIT-I**

Data Ware Housing Definition Usage and Trends DBMSVs. Data Warehouse Data Marts Metadata Data Mining Definition & Application DBMS Vs. Data Mining KDD Versus Data Mining Data Mining Techniques Business Intelligence Introduction Cycle of a Business Intelligence Analysis Data Preprocessing: Need Data Cleaning Integration & Transformation

##### **UNIT-II**

Data Warehouse Process & Architecture OLAP and OLTP Definitions Difference Between OLAP and OLTP Dimensional Analysis Multidimensional Data Mode Data Cubes Drill-Down and Roll-Up – Slice and Dice or Rotation Operations Types of OLAP ROLAPvs. MOLAP Schemas for Multidimensional Database: Stars Snowflakes and Fact Constellations Relation between Business Intelligence I and Data Warehouse the Business Intelligence User Types Standard Reports Interactive Analysis and Ad Hoc Querying Parameterized Reports and Self-Service Reporting Dimensional Analysis Alerts/Notifications Visualization: Charts Graphs Widgets Scorecards and Dashboards

##### **UNIT-III**

Association Rule Mining Single-Dimensional Boolean Association Rules Incremental Database Dynamic Database Apoiri Algorithm FP Growth Multi-Level Association Rules from Transaction Databases

**UNIT-IV**

Classification and Prediction Concepts of Decision Tree Induction and Bayesian Classification  
Cluster Analysis Categorization of Methods Partitioning Methods K-Means Algorithm Outlier  
Analysis Hierarchical Methods

**UNIT-V**

Emerging Technologies - Machine Learning Big Data: Introduction Importance Four vs Data Mining  
for Business Applications Like Fraud Detection Market Segmentation Retail Industry  
Telecommunications Industry Banking & Finance and CRM etc. Spatial Databases Multimedia  
Databases Time Series and Sequence Data Text Databases Web Mining Concepts.

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***Reference Books:***

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1. Jiawei Han Michelinekamber “Data Mining Concepts and Techniques” Morgan Kaufmann Publishers
2. Arun K Pujari “Data Mining Concepts and Techniques” University Press
3. G.K.Gupta “Data Mining with Case Studies” PHI Pvt Ltd

## 3MSC (CS) 5(C)-CLOUD COMPUTING

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

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### *Course Objectives:*

- To Learn Fundamentals of Cloud Computing.
- To Know Various Cloud Computing Technologies
- To Understand Virtualization Fundamentals Foundation
- To Introduce Data Storage in Cloud
- To Learn Elements and Services in Cloud Computing
- To Learn Application Platform for Cloud Applications.
- To Introduce Various Cloud Services.
- To Know Tools of Cloud Computing

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### *Course Outcome:*

1. Describe the Key concepts Advantages Limitations and Applications of Cloud Computing
2. Explain the various Models and services of Cloud.
3. Understand and Describe the Core Issues and challenges of cloud computing Such as Security Privacy and Interoperability.
4. Select and Apply Suitable Technologies Tools and Applications in the Cloud Computing Driven Systems
5. Design and develop the efficient solutions of the Cloud Computing problems and issues with consideration of environment and sustainable development.
6. Analyze the interface requirement for deploying the Applications in Cloud

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Introduction to Cloud Computing Definition History Importance Characteristics Pros & Cons Cloud Computing Technologies Types of Cloud- Public & Private Clouds Community Cloud Hybrid Cloud Infrastructure Cloud Service Models Cloud Deployment Models.

#### **UNIT- II**

Virtualization Characteristics Benefits Virtualization in Cloud Computing Hypervisors Multitenancy Types of Tenancy Virtualization - Architecture Clustering Grid Computing and Virtualization Virtual Infrastructure CPU Virtualization Network and Storage Virtualization Cloud Tools - VMware Eucalyptus Cloudsim Opennebula.

#### **UNIT- III**

Cloud Computing Application Platform Tools for Building Cloud Programming in the Cloud Moving Applications to Cloud Microsoft Cloud Services - Azure Google Cloud Applications -Gmail Calendar Docs Video etc. Google App Engine Amazon Cloud Services EC2 Other Cloud Services - Cisco Webex Mail Yahoo Zimbra Elasticemail Salesforce.Com. IBM.

#### **UNIT- IV**

Data Storage and Cloud Computing - Introduction to Enterprise Data Storage-DAS SAN NAS Data Storage Management FAT NTFS Cloud File Systems Distributed Data Storage - Amazon Dynamo Couchdb Thrudbetc Online File Storage Amazon Storage System.

#### **UNIT- V**

Cloud Computing Services -Cloud Computing Elements Cloud Do's and Don'ts Understanding Services and Applications by Types - Web Based Services Infrastructure Services On-Demand Computing Other Cloud Services- STAAS DAAS INAAS Future Trends in Cloud Computing Mobile Cloud Multimedia Cloud Energy Aware Cloud Computing Jungle Computing Online Photo Editing Services.

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#### ***Reference Books:***

1. Raj Kumar Buyya James Broberg andrezei M.Goscinski -Cloud Computing: Principles and Paradigms-Wiley 2011.
2. Srinivasan J.Suresh-Cloud Computing – a Practical Approach for Learning and Implementation Pearson India [ISBN-978131776513]
3. Toby Velt Anthony Velt Robert Elsenpeter-Cloud Computing a Practical Approach - McGraw Hill 2010 [ISBN: 0071626948]
4. Greg Schulz -Cloud and Virtual Data Storage Networking Auerbach Publications [ISBN: 978-1439851739].
5. Marty Poniatowski-Foundations of Green IT- [ISBN: 978-0137043750].
6. Ravi Kant Soni Learning Spring Application Development Packt Publishing.
7. Michael Miller Cloud Computing 2008.



### 3MSC (CS) 5(D) E-COMMERCE AND E-GOVERNANCE

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

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#### *Course Objectives:*

- To Develop Skills in Understanding Strategic Issues Related to E- Commerce and E-Governance
- To Develop a Broad Knowledge of E-Governance and E-Commerce Activities in India
- To Understand the Electronic Payment Systems
- To Develop Knowledge of How the Government May Contribute in Moving the Country Towards E-Commerce and E- Governance

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#### *Course Outcome:*

1. Explain and demonstrate E-Governance Initiatives at the National Level in India
2. Make Classification of E-Commerce and E- Governance
3. Students Able to Think Critically and Analytically to New Successful Business Ideas.

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#### *Unit-wise Syllabus :*

##### **UNIT-I**

Introduction to E-Commerce: Definition History of E-Commerce E-Business Models B2B B2C C2C C2B Environment of E-Commerce Dimensions of E-Commerce Ethical Issues Electronic Data Interchange Value Chain and Supply Chain E-Commerce Marketing E-Commerce Strategy E-Commerce Infrastructure Advantages and Disadvantages of E-Commerce.

##### **UNIT- II**

Electronic Payment Systems: Payment Gateways, Payment Cards, Credit Cards, Debit Cards, Smart Cards E-Credit Accounts E-Money Marketing on the Web Categories of E-Commerce Edi Marketing Strategies Advertising on the Web Customer Service and Support Internet Banking Introduction to M-Commerce Case Study: E-Commerce in Passenger Air Transport Element of E-Commerce Issues of E-Commerce

##### **UNIT- III**

E-Government Theoretical Background of E-Governance Issues in E-Governance Applications Evolution of E-Governance its Scope and Content Benefits and Reasons for the Introduction of E-Governance E-Governance Models- Broadcasting Critical Flow Comparative Analysis Mobilization and Lobbying Interactive Services / G2CC2G

##### **UNIT- IV**

E-Readiness E-Government Readiness E- Framework Step & Issues Application of Data Warehousing and Data Mining in E-Government Case Studies: Nicnet-Role of Nationwide Networking in E- Governance E-Seva. E-Governance Projects in India, Measures to be considered before going for E-Governance Workplan and Infrastructure

##### **UNIT- V**

E-Government Systems Security: Challenges and Approach to Security of E-Government Security Concern in E-Commerce Security for Server Computers Communication Channel Security Security

for Client Computers. E-Security Network and Web Site Risk for E-Business Information Technology ACT 2000 and its Highlights Related to E-Commerce E-Security Firewalls Electronic Market / E-Shop Introduction to Security Types of Securities Security Tools Network Security.

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***Reference Books***

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1. Gary P. Schneider "E-Commerce" Cengage Learning India.
2. C.S.R. Prabhu "E-Governance: Concept and Case Study" PHI Learning Private Limited.
3. P. Tjoseph S.J. "E-Commerce an Indian Perspective" Prentice-Hall of India.
4. V. Rajaram "Essentials of E-Commerce Technology" PHI Learning Private Limited.
5. Amir Manzoor "E-Commerce: an Introduction" Lambert.

## 3MSC(CS)5(E) -LINUX SERVER ADMINISTRATION

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

### Course Objectives

- Fully Understand the Most Important and Fundamental Concepts of Linux Server Administration
- Understand How to Install and Customize Linux (Administration of Linux Servers from the GUI); Manage Users Permissions Folders and Native Applications;
- Configure Internet and Intranet Services (Understanding and Managing the Linux TCP/IP Networking Stack and Services);
- Performance Tuning Security (Building Robust Firewalls and Routers) and
- Creating and Maintaining Print E-Mail FTP and Web Servers.

### Course Outcome:

1. Make Appropriate Decisions During the Configuration Process to Create a Properly Functioning Linux Environment.
2. Use Programs and Utilities to Administer a Linux Machine.
3. Explain How a Linux Server Can Be Integrated Within a Multi-Platform Environment.
4. Analyze the Need for Security Measures for a Linux Environment.
5. Develop shell program

### Unit-wise Syllabus :

#### UNIT-I

Installing Requirement Partitioning the Hard Drive for Linux Installing the Linux System System Startup and Shut-Down Process System Administration: Common Administrative Tasks Configuration and Log Files Role of System Administrator.Introduction to Shell Programming-Develop Some Shell Programs.

#### UNIT-II

Managing User Accounts-Adding & Deleting Users Changing Permissions and Ownerships Creating and Managing Groups Modifying Group Attributes Temporary Disable User's Accounts Creating and Mounting File System File Security & Permissions Becoming Super User Using su (super user),Host Name Disk Partitions & Sizes Users Kernel. Backup and Restore Files Installing and Removing Packages. Starting & Using KDE & GNOME Graphical Interfaces.

Basic Networking Administration: Setting up a LAN Using Linux Choosing Peer to Peer Vs Client/Server Model Setting up an Ethernet LAN Configuring Host Computers Checking Ethernet Connecting Connecting to Internet Common Networking Administrative Tasks Configuring Ethernet Initializing Ethernet Interface IPconfig Netstat and Netconfig Commands TCP/IP Network DNS Services.

#### UNIT-III

Installation Configuration & Administration of Following Servers in Linux

- Mail Server
- Remote Access

- DHCP
- Ftp Server

#### UNIT-IV

Installation Configuration & Administration of Following Servers in Linux

- DNS
- Apache Web Server
- NFS
- Samba
- VNC Serve

#### UNIT-V

- Using Mysql Databases - Mysqldb Commands Managing Database Users and Access Rights
- Creating and Restoring Mysqldb Backups Configuring Mysqldb Databases

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#### **Reference Books:**

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1. Fedora and Red Hat Enterprise Linux Bible by Christopher Negus Wiley India Ltd.
2. Christopher Negus -Linux Bible Wiley India Ltd
3. Linux Administration Kogent Learning Solutions Inc. ISBN 13- 9789350044209 ISBN 10- 935004420x Wiley India
4. Forouzan Unix & Shell Programming -Cengage Publications

#### **List of Experimentson Linux Server administration**

##### **System Startup and Shutdown**

This module explains how to manage startup and shutdown processes in Linux.

##### **Topics**

- Understanding the Boot Sequence
- The Grand Unified Boot Loader
- GRUB Configuration Files
- System Configuration Files in /etc
- The init Process
- SysVinit Startup
- chkconfig and service
- Upstart
- systemd
- Shutting down/Rebooting the System

##### **Experiment 1**

- Boot into non-graphical mode using GRUB
- Add a new startup service with System V
- Add a new startup services with system
- Run Shutdown vs. Halt vs. Reboot

## Linux File Tree System Layout

This module explains how the Linux File system is organized and points out the key directories and their roles.

- **Topics**
  - Data Distinctions
  - FHS Linux Standard Directory Tree
  - root (/) directory
  - /bin
  - /dev
  - /etc
  - /home
  - /lib and /lib64
  - /media
  - /mnt
  - /opt
  - /proc
  - /sys
  - /root
  - /sbin
  - /tmp
  - /usr
  - /var
  - /run

### Experiment 2

- Change size of the default directories
- Touring the /proc Filesystem

## Kernel Services and Configuration

This module explains how the Linux Kernel is configured how the modules and utilities work the function of sysctl and udev and Device Management.

### Lessons

- Kernel Overview
- Kernel Configuration
- sysctl
- Kernel Modules
- Module Utilities
- Module Configuration
- udev and Device Management

### Experiment 3

- Manipulating system tunables with sysctl
- Changing the maximum process ID
- Working with Kernel modules
- Working with udev

## **Partitioning and Formatting Disks**

This module explains how to work with disks in Linux by naming partitioning and sizing them.

### **Topics**

- Common Disk Types
- Disk Geometry
- Partitioning
- Naming Disk Devices
- Sizing up partitions
- Partition table editors

### **Experiment 4**

- Using a file as a disk partition image
- Partitioning a Disk Image file
- Using losetup and parted
- Partitioning a real hard disk

## **Linux Filesystems**

This module explains how to work with Linux Filesystems starting with the understanding that Linux treats everything as a file. IT covers Virtual filesystem (VFS) Filesystem Usage and Attributes Major types (ext4 XFS btrfs) and how to create format mount swap and repair Filesystems.

### **Topics**

- Some Notes About Filesystems
- Virtual Filesystem (VFS)
- Filesystem Concepts
- Disk and Filesystem Usage
- Extended Attributes
- ext4
- XFS
- btrfs
- Creating and formatting filesystems
- Checking and Repairing Filesystems
- Mounting filesystems
- Swap
- Filesystem Quotas

### **Experiment 5**

- Defragmenting a system
- Modifying Filesystem parameters using tune2fs
- Working with file attributes
- Mounting options
- Managing swap space
- Filesystem quotas
- Working with XFS
- Working with btrfs

**RAID and LVM**

This module explains how to work with RAID and Logical Volume Management (LVM).

**Topics**

- RAID
- RAID Levels
- Software RAID Configuration
- Logical Volume Management (LVM)
- Volumes and Volume Groups
- Working with Logical Volumes
- Resizing Logical Volumes
- LVM Snapshots

**Experiment 6**

- Creating a RAID device
- Creating Logical Volumes

**Processes**

This module explains how to work with Linux processes. It begins with an overview of what processes are and how they work before proceeding to illustrate how to create monitor prioritize and limit processes.

**Topics**

- Programs and Processes
- Process States
- Execution Modes
- Daemons
- Creating Processes
- Process Limits
- Process Monitoring
- Signals
- niceness
- Libraries

**Experiment 7**

- Controlling processes with ulimit
- Using ps and top
- Monitoring process states
- Examining signal priorities and execution

**Package Management Systems**

This module explains how to work with the major package management systems used in Linux distributions. Covers both RPM and DKPG as well as the use of version control systems such as git.

**Topics**

- Software Packaging Concepts
- RPM (Red Hat Package Manager)
- DPKG (Debian Package)
- Revision Control Systems

**Experiment 8**

- Using RPM
- Rebuilding the RPM database
- Using DKPG
- Version control with git

**Package Installers**

This module explains how to use the major package installers including yum zypper and APT. It also explains the role that package installers play in automating software management and dealing with dependencies.

**Topics**

- Package Installers
- yum
- zypper
- APT

**Experiment 9**

- Basic yum commands
- Using yum to find information about a package
- Managing groups of packages with yum
- Adding a new yum repository
- Basic zypper commands
- Using zypper to find information about a package
- Basic APT commands
- Using APT to find information about a package
- Managing groups of packages using APT

**User and Group Account Management**

This module explains how to work with users and groups in Linux. It also covers how to work with passwords restricted shells the root account Pluggable Authentication Modules (PAM) LDAP and SSH.

**Topics**

- User Accounts
- Management
- Passwords
- Restricted Shells and Accounts
- The root Account
- Group Management
- PAM (Pluggable Authentication Modules)
- Authentication Process
- Configuring PAM
- LDAP Authentication
- File Permissions and Ownership
- SSH

**Experiment 10**

- Working with user accounts
- Working with groups
- Configuring PAM
- Using chmod



**Backup and Recovery Methods**

This module explains how to backup data in Linux. It covers the tools that are used for backup and compression as well as for moving and copying files and also for restoring files.

**Topics**

- Backup Basics
- cpio
- tar
- Compression: gzip bzip2 and xz and Backups
- dd
- rsync
- dump and restore
- mt
- Backup Programs

**Experiment 11**

- Using tar for backup
- Using cpio for backup
- Using rsync for backup

**Networking**

This module explains how to conduct basic networking in Linux. It covers IP addresses Hostnames Network Interfaces Routing and Name Resolution.

**Topics**

- IP Addresses
- Hostnames
- Configuring Network Interfaces
- Routing
- Name Resolution
- Network Diagnostics

**Experiment 12**

- Static configuration of a network interface
- Adding a static hostname
- Adding a network interface alias

**Firewalls**

This module explains how to work with firewalls in Linux. It covers command line tools and GUI tools as well as firewalld. Zones and source management are discussed as is service and port management.

**Topics**

- Firewalls
- Interfaces
- firewalld
- Zones
- Source Management
- Service and Port Management

**Experiment 13**

- Installing firewalld
- Examining firewall-cmd
- Adding services to a zone
- Using the firewall GUI

## Local System Security

This module explains how to secure systems against both internal and external threats. It covers how to identify risks and provides guidance on how to decide what protection is appropriate. Finally it covers the basic types of security available (physical filesystem and security modules e.g. SELinux).

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### Topics

- Local System Security
- Creating a Security Policy
- Updates and Security
- Physical Security
- Filesystem Security
- Linux Security Modules

### Experiment 14

- Using SELinux
- Security and mount options
- Using umask
- Using setuid and scripts

## Basic Troubleshoot and System Rescue

This module explains how to conduct troubleshooting in Linux as well as likely sources of issues. It covers basic concepts in system rescue and recovery and how to identify corrupted filesystems.

### Topics

- Troubleshooting Overview
- Things to Check: Networking
- Boot Process Failures
- Filesystem Corruption and Recovery
- Virtual Consoles
- Rescue Media and Troubleshooting
- System Rescue and Recovery

### Experiment 15

- Preparing to use Rescue/Recover media
- Recovering from a corrupted GRUB configuration
- Recovering from a password failure
- Recovering from partition table corruption
- Recovering using the install image

### 3MSC (CS) 6-COMPUTER LAB 3

| L | T | P  | C | Internal Evaluation | Practical Exams | Total Marks |
|---|---|----|---|---------------------|-----------------|-------------|
| 0 | 0 | 10 | 5 | 20                  | 80              | 100         |

#### JAVA Programming Lab

1. Write a Program in Java to Calculate the Simple Interest.
2. Write a Program in Java to Calculate Sum of Two Numbers Input from Command Line Argument.
3. Write a Program in Java to Calculate Area of Circle Using Scanner Class.
4. Write a Program in Java to Calculate Square Root of a Number.
5. Write a Program in Java to Display Name Age Calendar and Salary of a Person Input from the Keyboard.
6. Write a Program in Java to Display Grading of Student When His Percentage is Input from Keyboard.
7. Write a Program in Java to Display Odd Number from 1 to 100.
8. Write a Program in Java to Display the Following Pattern.

```

1
2 2
3 3 3
4 4 4 4
5 5 5 5 5

```

9. Write a Program in Java to Display the Following Pattern Using Function.

```

1
2 2
3 3 3
4 4 4 4
5 5 5 5 5

```

10. Write a Program in Java to Display the Following Pattern Using Function.

```

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

```

11. Write a Program in Java to Display the Following Pattern Using Function.

```

1
2 3
4 5 6
7 8 9 10
11 12 13 14

```

12. Write a Program in Java to Calculate the Factorial of a Number.
13. Write a Program in Java to Determine Whether a Number Input from Keyboard is Prime Number or Not.
14. Write a Program in Java to Display the Prime Numbers from 1 to 500 Using Function.

15. Write a Program in Java to Show Accessing Class Members and use a Dot(.).
16. Write a Program in Java to Show Multilevel Inheritance.
17. Write a Program in Java to Show Single Inheritance.
18. Write a Program in Java to Concatenate Two Strings Without Using Library Function.
19. Write a Program in Java to Make First Alphabet Capital of Each Word in a String.
20. Write a Program in Java to Get the Last Index of Any Given Character in a String.
21. Write a Program in Java to Reverse Words of a String.
22. Write a Program in Java to Find Occurrences of Each Character in a String.
23. Java Program to Get String and Count Number of Words in Provided String.
24. Write a Program in Java to Check Given String is Palindrome String or Not in Java.
25. Write a Program in Java to Reverse Each Word of Given String.
26. Write a Program in Java to Get Sub String from a Given String.
27. Java Program to Convert String to Lowercase and Uppercase.
28. Create a Java Applet and Show the use of Drawstring() Function.
29. Create a Java Applet to Show How to use Various Methods of Applet Class and Graphics Class in a Java Applet.
30. Write a Program in Java to Show the use of Interface.
31. Create a Java GUI Application Using Labels and Textfields.
32. Create a Java GUI Application Using Radiobuttons.
33. Create a Java GUI Application Using Checkboxes.
34. Create a Java GUI Application Using Comboboxes.
35. Create a Java GUI Application Using Listboxes.
36. Create Two Html Pages with Links to Navigate from One Page to Other Page.
37. Write a Servlet to Display Current Date and Time of Server On Client : Date Servlet
38. Write a Servlet to Display Natural Numbers from 1 to 100 : Numberservlet
39. Create a JSP to Display Natural Numbers from 1 to 50 :Number.Jsp and Write Down the Process of Running It Step by Step.
40. Create a JSP to Display Current Date and Time of Server onClient :Date.Jsp and Write down the Process of running it Step by Step.

#### **Group Assignment**

1. Scientific Calculator utility
2. Chat Application
3. Text Editor Like Notepad/Wordpad
4. Paint Application

#### **Web Technologies Lab**

1. Write an HTML code to display your education details in a tabular format.
2. Write an HTML code to display your CV on a web page.
3. Write an HTML code to create a Home page having three links: About Us Our
4. Services and Contact Us. Create separate web pages for the three links.
5. Write an HTML code to create a login form. On submitting the form the user
6. Should get navigated to a profile page.
7. Write an HTML code to create a Registration Form. On submitting the form the
8. User should be asked to login with this new credentials.

9. Write an HTML code to create your Institute website Department Website and
10. Tutorial website for specific subject.
11. Write an HTML code to illustrate the usage of the following:
  - Ordered List
  - Unordered List
  - Definition List
12. Write an HTML code to create a frameset having header navigation and
13. content sections.
14. Write an HTML code to demonstrate the usage of inline CSS.
15. Write an HTML code to demonstrate the usage of internal CSS.
16. Write an HTML code to demonstrate the usage of external CSS.
17. Write a Java script to prompt for users name and display it on the screen.
18. Design HTML form for keeping student record and validate it using Java script.
19. Write an HTML program to design an entry form of student details and send it to store at database server like SQL Oracle or MS Access.
20. Write programs using Java script for Web Page to display browsers information.
21. Create an applet which will have a line an Oval & a Rectangle
22. Writing program in XML and create a style sheet in CSS & display the document in internet explorer.
23. Write an XML program to display products
24. Write a program using PHP and HTML to create a form and display the details
25. entered by the user
26. Create a PHP page using functions for comparing three integers and print the largest number.
27. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
28. Write a PHP script that finds out the sum of first n odd numbers.
29. WAP to check whether the given number is prime or not.
30. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
31. Write a PHP function that checks if a string is all lower case.
32. Write a PHP script that checks whether a passed string is palindrome or not? ( A palindrome is word phrase or sequence that reads the same backward as forward e.g. madam or nurses run)
33. WAP to create and sort an array.
34. WAP to create an associative array.
35. Write a PHP script to read a file character by character
36. Write a PHP script to append text to a file

**SEMESTER-IV****4MSC (CS) 1 -PYTHON PROGRAMMING**

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

**Course Objectives:**

- To Introduce Python Programming Language as Multipurpose Programming Language with Features and Applications.
- To Learn Installing Python and Introducing Cross Multiplatform Usage of Python.
- To Practice Basic Language Features of Python.
- To Implement Oops Concepts Using Python.
- To Work with Files in Python

**Course Expected Outcome:**

1. Install and use Python on Various Platform.
2. Understand and Explain the features of Python language
3. Design and Develop Python Applications for Data Analysis using Object-Oriented concept.
4. Build Package and Modules in Python with Reusability and Exception Aspect
5. Write Programs for Reading and Writing Files in Python.

**Unit-wise Syllabus :****UNIT-I**

Environment Setup of Python Application Area Interactive Mode and Script Mode Data Types Mutable and Immutable Variables Expressions and Statements Variables and Keywords Operators and Operands in Python Expressions and Statements; Taking Input (Using Raw\_Input( ) and Input( ) and Displaying Output.

Functions: Importing Modules Invoking Built in Functions Functions from Math Module Functions from Random Module. Function from Date Time Module Functions from Remodule Composition Defining Functions Invoking Functions Scope Passing Parameters Scope of Variables Void Functions and Functions Returning Values Recursion Conditional and Looping Construct use of Compound Expression in Conditional and Looping Construct

**UNIT- II**

Strings: String Operators Comparing Strings Using Relational Operators; String Functions & Methods Regular Expressions and Pattern Matching

Lists: Concept of Mutable Lists Creating Initializing and Accessing the Elements Traversing Appending Updating and Deleting Elements Composition Lists as Arguments List Operations List Functions and Methods

Dictionaries: Concept of Key-Value Pair Creating Initializing and Accessing the Elements in a Dictionary Traversing Appending Updating and Deleting Elements. Dictionary Functions and Methods

Tuples: Immutable Concept Creating Initializing and Accessing Elements in a Tuple Tuple Assignment Tuple Slices Tuple Indexing Tuple Functions.

### **UNIT- III**

Concept of Object Oriented Programming: Data Hiding Data Encapsulation Class and Object Polymorphism Inheritance Advantages of Object Oriented Programming over Earlier Programming Methodologies Classes: Defining Classes (Attributes Methods) Creating Instance Objects Accessing Attributes and Methods Using Built in Class Attributes (Dir Doc Name Module Bases) Constructor (Init() Del() and Str()) Methods in a Class Private Attributes (Limited Support) Importance of "Self" (Acts as a Pointer to Current Calling Object) Operator Overloading with Methods

### **UNIT- IV**

Inheritance: Concept of Base Class and Derived Class: Single Multilevel and multiple Inheritance- Overriding Methods Using Super() in Derived Class to Invoke Init() or Overridden Methods of Parent Class

Data File: Need for Non-Bold for Data File Types of Data File-Text and Binary Opening and Closing Files- Open() Close() Access Modes (Output Input Default) File Object Access Modes Reading and Writing a File Read() Readline() Readlines() Write() Writelines File Positions (Seek() Tell()) Renaming and Deleting a File Flush()

### **UNIT- V**

Implementation of Basic File Operations on Text and Binary File in Python: Creating/Writing Data into File Reading and Displaying Data from File Searching for Particular Data from a File Insertion and Deletion of Data from an Already Existing File Modification of Data in File

Error and Exceptions: Name error IndexError TypeError I/O Error ImportError ValueError EOFError Generator Function Using Yield

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### ***Reference Books:***

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1. Mark Lutz o-'Learning Python 5th Edition reilly Publication
2. Fabrizio Romano-Learning Python Download Link – <https://www.packtpub.com/packt/free-ebook/learning-python>
3. Mark Lutz-Learning Python (Fourth Edition) –Download Link <http://freebook.qiniudn.com/learning%20python%204th%20edition.pdf>
4. [HTTPS://Docs.Python.Org/3/Tutorial/Index.Html](https://docs.python.org/3/tutorial/index.html)

## 4MSC (CS) 2- DOT NET TECHNOLOGY

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

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### *Course Objectives:*

- Identify the Basics of .Net Framework Architecture and User Programs
- Do GUI Programming Using Vb.Net and C#
- Examine the Challenges Involved in .Net Framework Programming
- Do Event Driven Programming Projects
- Learn the ADO.NET Database Usages in Website Creation
- Empower the Websites with use of Xml.

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### *Course Outcome:*

1. Understand and explore various Features of .Net Framework
2. Analyze Design and Develop the GUI of Applications software Using VB.Net and C#
3. Design Develop and Implement Complete software Projects Using VB.Net and C# with consideration of Environment in team spirit.
4. Analyze the requirement design and develop Dynamic and Static Websites and web applications using .Net technology.
5. Integrate and Apply Different Components Including Database Xml with Proper Choice of Languages Mapping

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Introduction to .Net Framework Features & Architecture CL Common Type System MSIL Assemblies: Types of Assemblies Class Libraries. Event Drive Programming Methods and Events Related with Mouse and Keyboard. Programming in Visual Studio Types of Project in .Net IDE of Vb.Net- Menu Bar Toolbar Project Explorer Toolbox Properties Window Form Designer Form Layout Immediate Window Asp & Html Forms

#### **UNIT- II**

the Vb.Net Language- Variables Declaring Variables Data Types Scope & Lifetime of a Variable Arrays Types of Array Control Array Subroutine Functions Passing Argument to Functions Optional Argument Returning Value from Function. Control Flow Statements: Conditional Statement Loop Statement. Forms: Loading Showing and Hiding Forms Working with Multiple Forms Controlling One Form within Another Overview of C# Structure of C# Program C# in .Net.

#### **UNIT- III**

GUI Programming with Windows Form with Properties Methods and Events: Text Box Control Label Control Button Control Listbox Combo Box Checked Box Picture Box Radio Button Panel Scroll Bar Timer Control Adding Controls At Runtime Common Dialog Control: File Save Print Help. Designing Menus MDI Forms Overview of Dynamic Web Page Asp.Net Controls Applications Web



Servers Web Form Controls Server Controls Client Controls Adding Controls to a Web Form Form Validation Controls: Client Side Validation Server Side Validation

#### **UNIT- IV**

Ado.Net Architecture Create Connection Accessing Data Using Data Adapters and Datasets Using Command & Data Reader Data Bind Controls Displaying Data in Data Grid. Data Form Wizard Processing SQL1 & Access Database Using Ado.Net Object Model Connection Object Command Object Add Delete Move & Update Records to Dataset Executing Queries

#### **UNIT- V**

XML in .Net XML Basics Attributes Fundamental XML, Classes: Document Textwriter Textreader XML, Validations XML, in Ado.Net the XmlDataAdapter. Web Services: State Management- View State Session State Application State Web Service Description Language Building & Consuming a Web Service. Web Application Deployment Caching

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#### ***Reference Books***

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1. Steven Holzner Vb.Net Programming Black Book Dreamtech Publications
2. Evangelos Petroustos-Mastering VB.Net -BPB Publications
3. Mathew -The Complete Reference ASP.Net Macdonald TMH
4. Professional ASP.Net- Wrox Publication
5. Stephen Walther-Active Server Pages 2.0 (Unleashed) : Techmedia
6. Eric a. Smith -Asp 3 Programming Bible: IDG Books
7. C# Programming Wrox Publication
8. Matt Telles -C# Programming Black Book Dreamtech Publication

## 4MSC (CS) 3(A) – SOFTWARE TESTING AND QUALITY ASSURANCE

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

---

### *Course Objectives:*

- Understand Learn and Apply the Theoretical and Practical Knowledge of Software Testing.
- Introduce Quality Models Factors Affecting Quality Various Characteristics and Relationship Quality Metrics Estimation Techniques Quality Assurance and Control and Certification.
- Understand Learn and Analyze the Code by Applying Code Inspection Review and Structured Walkthrough Approaches for Static Testing Software Product.
- Understand the Key Concepts of Software Testing Such as Types Levels Process Strategies and Metrics of Software Testing and Defect Management.
- Learn the Various Testing Techniques and Hands on Testing Tool for Designing Exercising the Test Case on SUT and Auditing the Results.
- Introduce Understand and Learn Features and Working of Various Tools of Software Testing and Apply on Different Software Artifacts.

---

### *Course Outcomes:*

1. Explain and Apply Knowledge of Key Concepts of Software Testing Quality and Testing Tools.
2. Draw the DD Graph and Identify the Various Test Cases from Paths of Flow Graph of Software Testing Problem and Determine the Complexity of Software.
3. Design Test Cases and Develop Test Suite Write Test Scripts Set Environmental Variables for Carrying Out the Various Levels of Testing Manually and Automatically.
4. Manage Software Defects and Risks Within a Software Project.
5. Work Effectively in Profile of Software Tester Quality Assurance and Control officer Project Manager and Leaders.

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Software Testing Process Objectives Testing Techniques Software Testing Life Cycle Concept of Testing Types of Errors Stubs and Drivers Verification and Validation Different Types of Verification & Validations Mechanisms Concepts of Software Reviews Code Inspection and Code Walkthrough Testing of Component Based Software System Energy Efficient Testing Mobile Application Testing.

#### **UNIT-II**

Software Testing Methods Testing Fundamentals Test Case Design White Box Testing and its Types Black Box Testing and its Types Software Testing Strategies Strategic Approach to Software Testing UNIT Testing Integration Testing Validation Testing System Testing Test Planning Budgeting and Scheduling.

**UNIT-III**

Software Testing Metrics Concept and Developing Testing Metrics Different Types of Metrics Complexity Metrics Defect Management Definition of Defects Defect Management Process Defect Reporting Metrics Related to Defects Using Defects for Process Improvement.

**UNIT-IV**

Software Quality Factors Affecting Software Quality Quality Models Software Quality Estimation Quality Metrics Quality Assurance SQA Activities Software Reviews Formal Technical Reviews Quality Control Quality Management and SQA Plan. Quality Improvement Pareto Diagrams Cause-Effect Diagrams Scatter Diagrams Run Charts Total Quality Management Statistical Quality Assurance Software Reliability the ISO 9001 Quality Standard Six Sigma Informal Reviews.

**UNIT-V**

Quality Costs Quality Cost Measurement Utilizing Quality Costs for Decision-Making. Manual Vs Automatic Testing Basics of Automated Testing Drawback of Manual Testing Advantages of Automation of Testing Factors for Automation Testing Types Automation of Testing Tools Introduction to QTP , IDE Basic Components in QTP ,QTP Framework Write Scripts, Introduction to Winrunner and Rational Robot.

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***Reference Books:***

1. Roger S. Pressman Software Engineering – a Practitioners Approach McGraw Hill Education; 7 Edition 1 April 2009.
2. K.K. Aggarwal & Yogesh Singh “Software Engineering” 2nd Ed. New Age International Publishers New Delhi 2005.
3. Kshirsagar Naik Priyadarshi Tripathy Software Testing and Quality Assurance Theory and Practice Wiley-Spektrum; 1 Edition August 18 2008.
4. Donna C. S. Summers Quality Management Pearson; 2 Edition April 26 2008
5. Yogesh Singh Software Testing Cambridge University Press 2012
6. William Perry “Effective Methods for Software Testing” John Wiley & Sons New York 1995
7. Louise Tamres “Software Testing” Pearson Education Asia 2002
8. Cem Kaner Jack Falk Nguyen Quoc “Testing Computer Software” Second Edition Van Nostrand Reinhold New York 1993.
9. Boris Beizer “Black-Box Testing – Techniques for Functional Testing of Software and Systems” John Wiley & Sons Inc. New York 1995.

## 4MSC(CS)3(B)-BIG DATA ANALYTICS

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

---

### *Course Objectives:*

- Familiarize the Students with Most Important Information Technologies used in Manipulating Storing and Analyzing Big Data.
- This Course Gives Students all Around Learning of the Big Data Framework using Hadoop and Spark Including Yarn HDFS and Mapreduce
- It Provide an Overview of Approaches Facilitating Data Analytics on Huge Datasets.

---

### *Course Outcome:*

1. Ability to identify the characteristics of datasets and compare the trivial data and big data for various applications.
2. Demonstrate an ability to use Hadoop framework to efficiently store retrieve and process Big Data for Analytics.
3. Implement several Data Intensive tasks using the Map Reduce Paradigm

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Big Data- Introduction Characteristics Types Elements Traditional Vs. Big Data Business Approach Big Data Analytics Advantages Applications Distributed & Parallel Computing for Big Data Components in Big Data Architecture Virtualization Approaches.

#### **UNIT- II**

Statistics and Probability: Sampling Techniques - Data Classification Tabulation Frequency and Graphic Representation Measures of Central Value - Mean Mode Median Random Variable and Probability Theory.

#### **UNIT- III**

Hadoop- Introduction Features Advantages Versions Key Considerations of Hadoop RDBMS vs Hadoop Hadoop Ecosystem HDFS - Architecture Features Commands Processing Data with Hadoop Hadoop Yarn.

#### **UNIT- IV**

Mapreduce Framework Features Uses Working on Mapreduce Mapreduce Input and Output Operations Exploring Map and Reduce Functions Mapreduce Optimization Technique HBASE Introduction Architecture HBASE in Hadoop Applications.

#### **UNIT- V**

Processing Data with Mapreduce Task Execution & Environment – Installation of Eclipse Hadoop Java Development Kit and Linux Ubuntu OS Mapreduce Program Steps to Obtain Word Count Functionality of Input Format- Inputsplit Recordreader Fileinputformat Output Process of Fileoutputformat – Outputformat Recordwriter Role of Combiner Partitioner Debugging Mapreduce.

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### *Reference Books:*

1. Rob Kitchin The Data Revolution: Big Data Open Data Data Infrastructures And Their Consequences SAGE Publications Ltd
2. Croll and B. Yoskovitz Lean Analytics: Use Data to Build a Better Startup Faster o'reilly
3. Mayer-Schönberger and K. Cukier Big Data: A Revolution That Will Transform How We Live Work and Think

4. E. Siegel-Predictive Analytics: The Power to Predict Who Will Click Buy Lie or Die
5. Bernard Marr-Big Data in Practice Wiley publication.

## 4MSC (CS) 3(C)-INFORMATION SECURITY

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

---

### *Course Objectives:*

- Aware and Understand the Challenges and Scope of Information Security.
- Gain the Knowledge of Basic Security Concepts.
- Learn and Understand the Importance of Cryptographic Algorithms and Their Uses.
- Learn and Understand Access Control Mechanism Used for User Authentication and Authorization.
- Understand and Practice the Sockets Layer (SSL).
- Aware and Learn the Usages of Secure Internet Protocol (IP ) and HTTPS

---

### *Course Outcome:*

1. Explain the Principles of Cryptography and Cryptanalysis Including Symmetric and Asymmetric Encryption Hashing and Digital Signatures.
2. Explain the Fundamental Notions of Threat Vulnerability Attack and Countermeasure.
3. Be Able to Identify the Security Goals of an Information System Point Out Contradictory Goals and Suggest Compromises.
4. Identify and Classify Particular Examples of Attacks.
5. Implement the Various Security Algorithms.
6. Analyze the Root Causes of Attacks & Suggest Appropriate Solution for Different Types of Security Breach Scenario.

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### *Unit-wise Syllabus :*

#### **UNIT-I**

Introduction: Security Concepts:-Confidentiality Integrity and Availability Threats Risks Sources of Threats Attacks Classification Cryptography Confusion Vs. Diffusion Stream Ciphers Vs. Block Ciphers Classical Cryptography Objectives of Cryptography Secret-Key and Public-Key Cryptography Cryptanalysis RC5 Blowfish.

#### **UNIT- II**

Block Ciphers Block Cipher Principles Feistel Networks S-Boxes and P Boxes Block Cipher Des Elementary Number Theory Prime Numbers Factoring Modular Arithmetic GCD Modular Square Roots

#### **UNIT- III**

Key Exchange: Diffie-Hellman Public-Key Encryption: RSA Entity Authentication: Passwords Challenge-Response Algorithms Digital Signature Digital Certificates X509 Certificates SSL HTTPS and IPSEC.

#### **UNIT- IV**

Introduction to Hash Function : Message Digest: MD5 and SHA-1 Attacks on Hash Functions. MD Family SHA Family Trapdoor Functions Digital Signatures Overview of GPG Seahorse Frontends–Kleopatra Enigmail.

**UNIT- V**

Network Issues Public-Key Infrastructure (PKI) Kerberos Encryption Using Non-Cryptographic Tools (VI Zip) Authentication Principles and Methods Passwords Two-Factor Authentication Steganography Penetration Testing and Ethical Hacking.

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***Reference Books***

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1. William Stallings Cryptography and Network Security PHI.
2. Bruce Schneier- the Mathematics of Encryption- American Mathematical Society
3. Atulkahate “Cryptography and Network Security” TMH.
4. Calabrese Info Security Intelligence-Cryptography Principles Appl- Cengage Learn.
5. Krawetz- Intro to Network Security Cengage Learning.
6. Bruce Schneier Applied Cryptography John Wiley and Sons Mark Stamp
7. Mark Stamp Information Security: Principles and Practice John Wiley and Sons.
8. Matt Bishop Computer Security Art and Science Pearson Education.

## 4MSC (CS) 3(D)-ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | 00              | 20                  | 100         |

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### *Course Objectives:*

- To Understand the Concepts of Artificial Intelligence and Machine Learning.
- To Gain Knowledge of Supervised and Unsupervised Learning
- Understand the Design of Learning Systems.
- Understand the Design of Expert Systems.

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### *Course Outcomes:*

1. Demonstrate and Apply Artificial Intelligence Techniques Various Types of Production Systems Characteristics of Production Systems.
2. Design Neural Networks Architecture and Implement Functions and Various Algorithms Involved.
3. Fuzzy Logic Various Fuzzy Systems and Their Functions.
4. Genetic Algorithms its Applications and Advances
5. Able to Analyse and Design Expert Systems Through Learning the Machine

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### *Unit-wise Syllabus :*

#### **UNIT-I**

AI Introduction The AI problems what is an AI technique Characteristics of AI applications Current Trends in AI. Machine Learning: Machine Learning Overview Design of a Learning system Types of machine learning Applications of machine learning Variables and probabilities - Probability Theory Probability distributions

#### **UNIT-II**

Problem Solving General problem solving production systems control strategies forward and backward chaining Searching: Searching for solutions uniformed search strategies – Breadth first search depth first Search. Heuristic search Greedy best first search Knowledge Representations mapping & issues

#### **UNIT-III**

Soft Computing: Introduction of soft computing soft computing vs. hard computing various types of soft computing techniques applications of soft computing. Basic concepts of neural network Human Brain- Biological neural network evolution of artificial neural network Structure and Function of a single neuron Difference between ANN and human brain characteristics and applications of ANN Learning Methods Activation function neural network architecture.

#### **UNIT-IV**

Supervised Learning: Perceptron learning- Single layer multilayer Back propagation network Unsupervised Learning Neural Networks – Competitive Learning Networks – Kohonen Self-Organizing Networks



#### **UNIT-V**

Introduction to expert system and application of expert systems case studies MYCIN

Fuzzy Logic: Fuzzy set theory crisp set Fuzzy set Operations on Fuzzy Sets: Complement Intersections Unions Product Difference Properties of fuzzy set.

Genetic Algorithm: Fundamentals basic concepts working principle encoding fitness function reproduction

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#### ***Reference Books:***

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1. Elaine Rich and Kevin Knight “Artificial Intelligence” - Tata McGraw Hill.
2. Dan W. Patterson “Introduction to Artificial Intelligence and Expert Systems” Prentice India.
3. Nils J. Nilson “Principles of Artificial Intelligence” Narosa Publishing House
4. Christopher Bishop “Pattern Recognition and Machine Learning” Springer
5. Kevin P. Murphy “Machine Learning: A Probabilistic Perspective” MIT Press
6. EthemAlpaydin “Introduction to Machine Learning” MIT Press
7. Tom Mitchell "Machine Learning" McGraw-Hill
8. Stephen Marsland “Machine Learning - An Algorithmic Perspective” Chapman and Hall/CRC Press
9. S Rajasekaran & G.A. VijayalakshmiPai Neural Networks Fuzzy Logic & Genetic Algorithms Synthesis & Applications PHI publication.
10. S.N. Sivanandam& S.N.Deepa Principles of Soft Computing Wiley Publications.

## 4MSC (CS) 3(E)-MOBILE APPLICATION DEVELOPMENT

| L | T | P | C | Theory Paper | Practical Exams | Internal Evaluation | Total Marks |
|---|---|---|---|--------------|-----------------|---------------------|-------------|
| 5 | 0 | 0 | 5 | 80           | --              | 20                  | 100         |

### Course Objectives:

- To create basic Android applications using open-source platform
- To enhance ability of students for developing Android apps and publish onto the physical devices like tablets Smartphone's etc.

### Course Outcomes:

1. Design develop and build useful Android applications with persuasive User Interfaces.
2. Take advantage of Android's APIs for data storage user preferences files databases and content providers for App Development
3. Explain the features and challenges of mobile devices native app development frameworks hybrid app development frameworks- Understand
4. Apply the UI components multimedia usage location based services data storage mechanisms for the given problem.
5. Apply HTML5 in UI design for the given problem.
6. Design an application based on the user requirements.
7. Select appropriate framework for developing applications based on the problem requirements
8. Design and develop mobile applications for societal and environmental IT problems

### Unit-wise Syllabus :

#### UNIT-I

Introduction to Android Why Android Android Run Time Android Studio Introduction to Gradle Fundamentals Basic Building blocks – Activities Services BroadcastReceivers& Content providers UI Components- Views & notifications Components for communication -Intents & Intent Filters Android API levels(versions & version names) Application Structure AndroidManifest.xml

#### UNIT-II

Uses-permission Activity/services/receiver declarations Resources & R.java Layouts & Drawable Resources Activities and Activity lifecycleEmulator Launching emulator Editing emulator settings Emulator shortcuts Logcat usage Introduction to Android Device Monitor (ADM) File explorer Intents Explicit Intents Implicit intents

#### UNIT-III

Basic UI design Styles & Themes •Form widgets Text Fields Layouts RelativeLayout TableLayout FrameLayout Linear Layout Nested layouts [dipdpsipsp] versus px styles.xml drawable resources for shapes Adapters Array Adaptersm BaseAdapters ListView and ListActivityCustom listview GridView using adapters Gallery using adapters Android Session and Session management

#### UNIT-IV

Content Providers SQL DML & DDL Queries in brief SQLiteDatabse SQLiteOpenHelper Cursor SQLite Programming Reading and updating Contacts Android Debug Bridge(adb) tool Broadcast Receivers Services Notifications Alarm Via service Customize Toast Dialogs Tabs Animated popup panels Grid view Spinner Thread AsyncTask XML Parsing Android JSON parsing using Volley How to create REST API for Android app using PHP Mysql Accessing Phone services(CallSMS)

**UNIT-V**

Fragments Introduction to fragments Fragments Life Cycle Fragments in Activity Google Maps V2 using Fragments Develop Fragment based UI designs (Fragment TabsListView etc) Location based Services GPS Geocoding Network connectivity services Sensors(Accelerometer Gyroscope) Using Wi-Fi& Bluetooth Google Cloud Messaging for Android App Widgets

**Reference Books:**

1. James C. Sheusi " Android Application Development for Java Programmers" Cengage Learning
2. Wallace Jackson "Android Apps for Absolute Beginners" Apress Isbn : 9788132211372
3. Michael Burton Donnferker "android Application Development for Dummies" Dummies Isbn : 9788126538775
4. Pradeep Kothari " android Application Development (with Kitkat Support)" Kogent Learning Solutions Inc. Black Book Dreamtech Press ISBN : 9789351194095
5. Charlie Collins Michael Galpin et.al. " android in Practice" Manning ISBN : 9789350042397

**Online Reading / Supporting Material:**

1. [Http://Www.Developer.android.Co](http://Www.Developer.android.Co)
2. [Http://Developer.android.Com/About/Versions/Index.Html](http://Developer.android.Com/About/Versions/Index.Html)
3. [Http://Developer.android.Com/Training/Basics/Firstapp/Index.Html](http://Developer.android.Com/Training/Basics/Firstapp/Index.Html)
4. [Http://Developer.android.Com/Guide/Components/Intents-Filters.Html](http://Developer.android.Com/Guide/Components/Intents-Filters.Html).
5. [Http://Developer.android.Com/Training/Multiscreen/Screensizes.Html](http://Developer.android.Com/Training/Multiscreen/Screensizes.Html)
6. [Http://Developer.android.Com/Guide/Topics/Ui/Controls.Html](http://Developer.android.Com/Guide/Topics/Ui/Controls.Html)
7. [Http://Developer.android.Com/Guide/Topics/Ui/Declaring-Layout.Html](http://Developer.android.Com/Guide/Topics/Ui/Declaring-Layout.Html)
8. [Http://Developer.android.Com/Training/Basics/Data-Storage/Databases.Html](http://Developer.android.Com/Training/Basics/Data-Storage/Databases.Html)

**List of Practical:**

1. Installing android Environment
2. Create "Hello World" Application. That Will Display "Hello World" in the Middle of the Screen in the Emulator. Also Display "Hello World" in the Middle of the Screen in the android Phone.
3. Create an Application with Login Module. (Check Username and Password).
4. Create Spinner with Strings Taken from Resource Folder (Res >> Value Folder) and On Changing the Spinner Value Image Will Change.
5. Create a Menu with 5 Options and Selected Option Should Appear in Text Box.
6. Create a List of All Courses in Your College and On Selecting a Particular Course Teacher-in-Charge of That Course Should Appear At the Bottom of the Screen.
7. Create an Application with Three Option Buttons On Selecting a Button Color of the Screen Will Change.
8. Create and Login Application as Above. On Successful Login Pop Up the Message.
9. Create an Application to Create Insert Update Delete and Retrieve Operation On the Database.
10. Create a Simple Application Using android Resources.
11. Create a Simple Application Using Layouts.
12. Create a Simple Application Using Intents.
13. Create a Simple Application Using User Interfaces.
14. Create a Simple Application for Playing Audio and Video Files.
15. Create a Simple Application Using Database Connectivity with Sqlite Database..

**4MSC(CS)4-COMPUTER LAB 4**

| L | T | P  | C | Theory Paper | Internal Evaluation | Practical Exams | Total Marks |
|---|---|----|---|--------------|---------------------|-----------------|-------------|
| 0 | 0 | 10 | 5 | ---          | 20                  | 80              | 100         |

**List of Experiments on Dot Net**

1. Rocket Launching.
2. Calculator Simple
3. Calculator Scientific
4. Video Game with Sounds and Animation
5. Five Loops for Finding Average of N Numbers.
6. Word Editor.
7. Library Management System Using Access
8. Web Browser
9. Student Management System
10. Suitable Project of Your Choice.

**List of Experiments on Python**

1. Program to demonstrate basic data type in python
2. Program to demonstrate operators in python  
A cashier has currency notes of denominations 10 50 and 100. If the amount to be withdrawn is input through the keyboard using input() function in hundreds find the total number of currency notes of each denomination the cashier will have to give to the withdrawer
3. Program to demonstrate list and tuple in python
4. Write a program in Python A library charges a fine for every book returned late. For first 5 days the fine is 50 paisa for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled.
5. Write a program to accept the number of days the member is late to return the book and display the fine or the appropriate message
6. Write a program to calculate overtime pay of 10 employees. Overtime is paid at the rate of Rs.12.00 per hour for every hour worked above 40 hours. Assume that employee do not work for fractional part of an hour two numbers are entered through the keyboard write a program to find the value of one number raised to the power of another.
7. Write a function that receives marks received by a student in 3 subjects and returns the average and percentage of these marks. Call this function from main() and print the result in main
8. Write a program to read a file and display its contents
9. Write a program to demonstrate database connectivity in python

## 4MSC(CS)5-Project Work

| Subject Code | Subject Name | L | T | P  | C  | Theory Marks | Internal Marks | Practical Marks | Total Marks |
|--------------|--------------|---|---|----|----|--------------|----------------|-----------------|-------------|
| 4MSC(CS)5    | Project Work | 0 | 0 | 20 | 10 | --           | 40             | 160             | 200         |
|              | <b>Total</b> |   |   |    | 10 | --           | 40             | 160             | 200         |

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### ***GUIDELINES FOR MSC (CS) PROJECT***

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The Master of Science (CS) (MSC (CS)) programme is designed with the objective to prepare the students to take up positions in IT industries as Programmer Systems Designer, Software Engineer and Project Managers etc. The curricula are designed to provide students comprehensive knowledge covering the skills and core areas of computer science in theory and practical's. With the same objective, project is part of curricula in last semester of MSC (CS). In the project work students are supposed to develop quality software solutions by applying theoretical and practical knowledge of various courses learnt.

The Project work constitutes a major component in the course it needs to be carried out with due care and should be executed with seriousness by the students with essential foundation principles and practices to develop effective ways to solve computing problems.

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### ***OBJECTIVES***

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The objective of the project is to help the student develop the ability to apply theoretical and practical tools / techniques to solve real life problems related to industry academic institutions and research laboratories. After the completion of this project work the student should be able to describe the Systems Development Life Cycle (SDLC) in their carried out project:

- Evaluate systems requirements.
- Evaluate a problem definition.
- Collect information to determine requirements.
- Perform and evaluate feasibility studies like cost-benefit analysis technical feasibility time feasibility and Operational feasibility for the project.
- Work on data collection methods for fact finding.
- Construct and evaluate data flow diagrams.
- Construct and evaluate data dictionaries/ decision trees/ decision table.
- Create and evaluate graphical tools as systems flow charts entity-relationship (ER) diagrams and state transition diagrams.
- Decide the S/W requirement specifications and H/W requirement specifications.
- Plan the systems design phase of the SDLC.
- Distinguish between logical and physical design requirements.
- Design and evaluate system outputs.
- Design and evaluate systems inputs.
- Design and evaluate validity checks for input data.
- Design and evaluate user interfaces for input.

- Estimate storage requirements.
- Decide and describe various data structures.
- Perform coding for the project.
- Documentation requirements and prepare documentation.
- Perform various testing techniques/strategies.
- Be able to generate various reports in project.
- Able to deploy the project on machine/Lab/Real time environment
- Brief the maintenance procedures.
- To decide the future scope and further enhancement of the system.
- Plan for appendices (if any) to be placed in support with the project report documentation.

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### ***TYPE OF PROJECT***

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The majority of the students are expected to work on a real-life project preferably in some industry/ Research and Development Laboratories / Educational Institution / Software Company. Students are encouraged to work in the various areas of computer applications . However it is not mandatory for a student to work on a real-life project. The student can formulate a project problem with the help of her/his Supervisor and if approved the student can commence working on it.

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### ***PROJECT PROPOSAL FORMULATION***

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The project proposal should be prepared in consultation with Supervisor. Approval of the project proposal is mandatory to continue and submit the project work. The project proposal should clearly state the project objectives and the environment of the proposed project to be undertaken.

The project proposal should contain complete details in the following form:

1. Title of the Project
2. Introduction and Objectives of the Project, Project Scope
3. Project Category (RDBMS/OOPS/Networking/Multimedia/Artificial Intelligence/Expert Systems/ Cloud/ Security/ Data Analytics etc.)
4. Analysis (DFDs ER Diagrams Class Diagrams, Module Specification, Time Line etc. as per the project requirements).
5. A complete structure which includes:
  - Number of modules and their description to provide an estimation of the student's effort on the project.
  - Data Structures as per the project requirements for all the modules
  - Process Logic of each module
  - Reports generation.
6. Tools / Platform Hardware and Software Requirement specifications
7. Security mechanisms
8. Project Team members (If any)
9. Organization/ Company details with profile of supervisor (If project is carried out outside the department)

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***Project Work Guideline***

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- The project work should normally include software development.
- Preferably not more than one student is permitted to work on a project. However in case a large project at most two students may work on the same project. If 2 students have been allowed to work on a project the project synopsis and project reports by them must include only different modules undertaken / worked upon individually. Each student must submit a separate project proposal and a separate project reports related to her/his modules. Completely identical project synopses and/or project reports are not allowed. Only introductory and possibly concluding remarks may be similar or common. Each student has to undergo all the phases
- A candidate is required to present the progress of the Project work during the semester as per the schedule provided by the Study Institute.
- The Study Institute evaluate the progress of the project on the basis of following
  - i. Project Analysis & Planning
  - ii. Project Design & Development
  - iii. Project Testing & Validation
  - iv. Project Documentation
  - v. Project Presentation & Viva
- The Project Report is evaluated for total of 200 marks. Normally the evaluation shall be done by separate heads as Internal (40 marks) and External (160 marks).

**PROJECT REPORT FORMULATION**

Good quality white executive bond paper A4 size should be used for typing and duplication. Care should be taken to avoid smudging while duplicating the copies.

Page Specification: Leftmargin-3.0cms,Right margin- 2.0 cm, Top margin 2.54 cm,Bottom margin 2.54 cm, Line Spacing – Single, Font Size – 12 for normal Text ,Font Size 14 Headings and 16 for Chapter Heading ,Page Numbers - All text pages as well as Program source code listing should be numbered at the bottom of the pages.

The project report should contain the following:

1. Front Page – Pink Color
2. The Approved Performa and Synopsis.
3. Certificate from the Supervisor with her/his signature and date.
4. Certificate from company/industry in their letter head (if project is carried out outside the department)
5. Certificate of Originality/ Self Certificate
6. The Project Report documentation should include the following topics (as per the project requirements).
  - Acknowledgement
  - Table of Contents / Index with page numbering
  - Introduction / Objectives of the project
  - System Analysis
  - Feasibility Study
  - Software and Hardware Requirement Specifications
  - System Design

- Coding
- Validation checks
- Implementation and Maintenance
- Testing (Testing techniques and Testing strategies used along with the test data and the errors listed for each test case).
- System Security measures (Implementation of security for the s/w developed)
- Reports Tables Figures should be properly numbered/labeled
- Screen Shots of Projects
- Conclusion
- Future scope and further enhancement of the Project
- Bibliography/ References
- Appendices (if required)

Two copies of the original project report in bound form are to be submitted. Each student is required to prepare individual copy of Project Report in CD and submit along with his/her Project report. The same must contain the report results screenshots errors databases source codes (wherever it is not feasible explicit approval from the supervisor must be obtained). Soft copy of labeled and signed project CD should be in a thick envelope pasted inside of the back cover of the project report.

#### **Format for Project Certificate**

This is to certify that the project report entitled \_\_\_\_\_ submitted to Makhanlal Chaturvedi National University of Journalism & Communication in partial fulfilment of the requirement for the award of the degree of MASTER OF SCIENCE (CS) (MSC(CS)) is original work carried out by myself Mr / Ms ----- with enrolment no. \_\_\_\_\_ under the Supervision of Prof/Dr/Mr/Ms -----.

The matter embodied in this project is genuine work done by myself and has not been submitted whether to this University or to any other University / Institute for the fulfilment of the requirement of any course of study.

Date:

Name & Signature of the Student

With Contact Details (Email Phone & Address)

Name & Signature of the Supervisor

Date: .....