

Revised New Syllabus

MCA-I

Name of the Paper - : Computer Organization

No. of Lectures: per week 4hrs

Course No. IT-11

Total Lectures: 40

Total Marks : 100

Semester- I

Objectives: To provide basic knowledge of microprocessor its architecture, components, terminologies. This will make the student aware about the digital components of the computer hardware.

Contents of the course

Unit No.	Name of the Topic	Details	Lectures/ Period
1	Introduction to Digital Computer	Functions and Block Diagram of Computer , Types of Software – System software / Application software / Utility Software, Compilers, Interpreters, Assemblers, Linker, Loader & Programming Language Paradigm	5
2	Data Representation and Boolean Algebra	Binary, Octal, HEX and their inter-conversion , 1's and 2's complement., Binary Arithmetic., Number Systems – BCD, EBCDIC, ASCII, De-Morgan's Theorem, Duality Theorem, Algebra Rules, Laws, Logic Circuits, NOT, AND, OR, NAND, NOR, XOR, XNOR	3
3	Combinational Circuits	Half Adder, Full Adder, Binary Adder and Subtractor. , Decoder / Encoder , Multiplexer / Demultiplexer, Sequential Circuits , Flip Flops - SR, D, JK, Master – Slave, Edge Triggered , Shift Registers (Any one type) , Introduction to Counters: Synchronous as well as Asynchronous Counter (one example of Each)	6
4	Memory System	Memory Hierarchy, Primary Memory – DRAM, SDRAM, DDR, RDRAM. ROM, PROM, EPROM, EEPROM	5

5	CPU Organization	5.1 CPU Building Blocks 5.2 CPU Registers and BUS Characteristics Registers & System Bus Characteristics. Interface Basics (Only Block Diagram) + Local Bus features & Types should be covered. Addressing Modes, Interrupts: Concepts and types, Instruction and Execution Interrupt cycle, Hardwired and Micro Program control, RISC and CISC, Pipelining – Data Path, Time Space Diagram, Hazards. Instruction + Arithmetic Pipelining + RISC Pipelining	7
6	Processor Architecture	Components of Microprocessor, I/O Ports ,16-Bit (80286) Architecture, 32-Bit (80486) Architecture, Super scalar Architecture in Pentium, Processors,64-Bit (Pentium Dual-Core) Architecture	7
7	Multi-Processor Organization	Parallel Processing, Concept and Block Diagram, Types (SISD, SIMD, MIMD, MISD), Future Directions for Parallel Processors, Performance of Processors	7

Nature of Question Paper :

a) 20% marks - Objectives questions

40% marks – Short notes/ Short answers type questions

40% marks – Descriptive type questions

out of 20% marks for objectives questions 10% marks should be assigned to multiple choice questions and remaining 10% be assign to fill in the blanks or answer in one sentence etc.

however each faculty may decide nature and type of questions to be set subject to distribution of above percentage of marks

b) One descriptive type question will be compulsory. Paper setter should mention approximate words limit for short note/short answer type questions except diagrammatical and numerical questions

Reference Books:

- | | |
|---|-----------------------------|
| 1. Computer Organization & Architecture | Carpinell |
| 2. Computer System Architecture | Morris Mano |
| 3. Ad. Computer Architecture | Kaithwang |
| 4. Digital Computer Electronics | Malvino |
| 5. Micro Computer Systems | Yu Cheng Liu & Glann Gibson |

- | | |
|---|------------------------------|
| 6. Digital Electronics | Bartee |
| 7. Introduction to Digital Computer Design | V. Rajaraman & Radhakrishnan |
| 8. Computer Organization and Architecture | W. Stalling |
| 9. Intel Micro Processors | Barry Brey |
| 10. Computer Organization & Design | Pal Chaudhary |
| 11. Microprocessor Architecture | Ramesh Gaonkar |
| 12. Computer Architecture & Organization | J.P. Hayes |
| 13. Computer Organization | Hemchar |
| 14. Digital Logic and Computer Design | Morris Mano |
| 15. IBM PC and Clones | Govindarajulu |
| 16. An Introduction to Intel Family of Processors | -James Antonolcos |

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Name of the Paper - C Programming

No. of Lectures: per week 4hrs

Course No. IT-12

Total Lectures : 40

Total Marks : 100

Semester- I

Objective : This is the first programming language subject student will learn. This subject will teach them programming logic, use of programming instructions, syntax and program structure. This subject will also create foundation for student to learn other complex programming languages like C++, Java etc

Contents of the course

Unit No.	Name of the Topic	Details	Lectures/ Period
1.	An Overview of C	A Brief History of C, C is middle-level Language, C is a Structured Language, Compiler Vs Interpreters, The Form of a C Program., Library & Linking., Compilation & Execution of C. Program on Dos & Unix	2
2.	Variables, Data Types, Operator & Expression	Character Set, C Token, Identifier & Keyword, Constant, Integer, Floating Point, Character, String, Enumeration, Data Types in C, Data Declaration & Definition, Operator & Expression, Arithmetic, Relational, Logical, Increment & Decrement, Bit wise, Assignment, Conditional, Precedence & Associability of Operators.	3
3.	Console I/O	Introduction, Character input & Output, String Input & Output, Formatted Input/Output (scanf/printf), sprintf & sscanf	2
4.	Control Statement	Introduction, Selection Statements, If, Nested if, if-else-if, The? Alternative, The Conditional Expression, switch, Nested switch, Iteration Statements, for loop, while loop, do-while loop, Jump Statements, Goto & label, break & continue, exit() function,	4
5.	Pointers	Introduction, Memory Organization, The basics of Pointer, The Pointer operator, Application of Pointer, Pointer Expression, Declaration of Pointer, Initializing Pointer, De-referencing Pointer, Void Pointer, Pointer Arithmetic, Precedence of &,	3

		* operators, Pointer to Pointer, Constant Pointer	
6.	Array & String	Single Dimension Arrays, Accessing array elements, Initializing an array, Multidimensional Arrays, Initializing the arrays, Memory Representation, Accessing array elements, Passing Single Dimension array to Function, Array & Pointer, Array of Pointer, String Manipulation Functions	5
7.	Function	Introduction, Arguments & local variables, Returning Function Results by reference & Call by value, Recursion	4
8.	Storage Class & Scope	Meaning of Terms, Scope - Block scope & file scope, Storage Classes, Automatic Storage, Extern Storage, Static Storage, Register Storage	2
9.	Structure, Union, Enumeration & typedef	Structures, Declaration and Initializing Structure, Accessing Structure members, Structure Assignments, Arrays of Structure, Passing Structure to function, Structure Pointer, Unions	3
10.	C Preprocessor	Introduction, Preprocessor Directive, Macro Substitution, File Inclusion directive, Conditional Compilation	2
11.	File handling	Introduction, Defining & Opening a File, Closing a File, Input/Output Operations on Files, Error Handling During I/O Operation, Random Access To Files, Command Line Arguments.	3
12.	Bitwise Operator	Introduction, Applications, Masking, Internal Representation of Date, Bit Fields	2
13.	Graphics In C	Introduction, Drawing Object in C, Line, Circle, Rectangle, Ellipse, Changing Foreground & Background, Filling Object by Color	4
14.	Command Line Arguments	Command Line Arguments	1

Nature of Question Paper:

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40% marks – Descriptive type questions

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however each faculty may decide nature and type of questions to be set subject to distribution of above percentage of marks

b) One descriptive type question will be compulsory. Paper setter should mention

approximate words limit for short note/short answer type questions except diagrammatical and numerical questions

Reference:

1. C: The Complete Reference: Herbert Schildt
2. Let us C Solutions: Y.P. Kanetkar
3. Spirit Of "C": Moolish Kooper.
4. Programming in C : S. Kochan.
5. C Programming Language: Kernighan & Ritchie.
6. Programming in C: R. Hutchison.
7. Graphics Under C: Y. Kanetkar

Note : Topic wise list of books is given.

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MCA-I

Name of the Paper - : **Operating System Concepts** No. of Lectures: per week 4hrs

Course No. IT-13

Total Lectures : 40

Total Marks : 100

Semester- I

Objectives:. The core structure, functions and design principles of operating system will be introduced with this subject.

Contents of the course

Unit No.	Name of the Topic	Details	Lectures/ Period
1.	Introduction	Logical View, User View, System Calls, Concept of Virtual Machine, Interrupt Concept	2
2.	Process Management	Process Concept, Process Control Block, Process Schedule Algorithms, Process operations, Interprocess Communication, Communication in Client-Server	5
3.	CPU Scheduling	Scheduling Concept, Scheduling Criteria, Scheduling algorithms, Scheduling Evaluation, Simulation Concept	5
4.	Process Synchronization & Deadlock	Synchronization concept, Synchronization Requirement, Critical Section Problem, Monitors, Deadlock concepts, Deadlock prevention & avoidance, Deadlock Detection, Deadlock Recovery	5
5.	Memory Management	Concept, Memory Management, Techniques, Contiguous & Non Contiguous allocation, Logical & Physical Memory, Conversion of Logical to Physical address, Paging, Segmentation, Segment with paging, Virtual Memory Concept, Demand paging, Page Replacement algorithm, Allocation of Frames, Page fault	5

6.	File management	File Structure, Protection, FILE system, Implementation, Directory structure, Free Space Management, Allocation Methods, Efficiency & Performance, Recovery	6
7.	Disk Management	Disk Structure, Disk Scheduling algorithm, Disk management, Swap Space concept and Management, RAID structure, Disk performance issues,	4
8.	Distributed Operating System	Difference Between, Distributed & Centralized OS, Advantages of Distributed OS, Types of Distributed OS, Concept of Global OS, NOS Architecture	6
9.	Features of different OS	Features of different OS , Integration of OS	2

Nature of Question Paper :

a) 20% marks - Objectives questions

40% marks – Short notes/ Short answers type questions

40% marks – Descriptive type questions

out of 20% marks for objectives questions 10% marks should be assigned to multiple choice questions and remaining 10% be assign to fill in the blanks or answer in one sentence etc. however each faculty may decide nature and type of questions to be set subject to distribution of above percentage of marks

b) One descriptive type question will be compulsory. Paper setter should mention approximate words limit for short note/short answer type questions except diagrammatical and numerical questions

Reference:

1. Operating System: Achyut Godbole
2. Operating System: Galvin
3. System Programming & OS: D.M. Dhamdhare
4. Red Hat Bible Core Fedora Linux: Christopher Negus (Wiley Pub.)

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Revised New Syllabus

MCA-I

Name of the Paper - **Principles Of Management And Organizational Behavior** No. of Lectures: per week 4hrs

Course No. **BM-11**

Total Lectures : 40

Total Marks : 100

Semester- I

Objective: The basic management concepts and use of management principles in the organization will be introduced to student through this elaborative subject.

Contents of the course

Unit No.	Name of the Topic	Details	Lectures/ Period
1.	Management	The need, scope, Meaning and Definition, The process of Management, Managerial levels/Hierarchy, Managerial functions, Planning, Organizing, Staffing, Directing, Controlling, Managerial skills, Technical, Conceptual, Human Resource, Types of managers, Functional, Specialize, Generalize, Line and staff managers,	5
2.	Evolution of Management Thought	Historical perspective, Classical Theories, Taylor, Fayol, Behavioral, HR Approach, Behavioral Science and Approach, Management Science Approach, System approach-with reference to management, organization and MIS Contingency approach	5
3.	Managerial Decision Making	Introduction, Decision making environment, open Systems, Closed system, Decision making under certainty, Decision making under uncertainty, Decision making under risk, Decision Types /models, Structured decisions, Unstructured decisions, Programmable decisions, Non programmable Decisions, Classical Model Administrative model, Decision making tools, Decision Making Tools, Herbert Simson's Model- Principle of Rationality / Bounded Rationality	7
4.	Organization	Introduction –definition, Need for	4

		Organization, Process of Organizing, Organizational structure, Functional organization, Product Organization, Territorial Organization	
5.	Organizational Behavior	Definition / Concepts, Need /importance/ relevance	2
6.	Individual Behavior and Understanding Self	Ego State, Transactional Analysis, Johari Window	4
7	Group and Group Dynamics	Concepts, small groups in organization why do people join groups, group decision making – nature & style, How group takes decision & strategies for improving group decision	4
8	Team Dynamics	Nature, Team Vs Group, Types of Team, Formation of Team & Team work	4
9	Leadership	Nature of Leadership, Leadership & Management, Importance, Leadership style, Theories of Leadership, Trait Theory, Leadership Behavior Theory	3
10	Motivation	Meaning, Importance, Theory- X, Y and Z	2

Important Note: The topics in Units 3,4,5 and 6 should be covered with the help of at least one exercise each. All topics in Organizational Behavior should be covered with the help of role plays, case studies, simulation, games etc.

Nature of Question Paper :

- a) 20% marks - Objectives questions
40% marks – Short notes/ Short answers type questions
40% marks – Descriptive type questions

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- b) One descriptive type question will be compulsory. Paper setter should mention approximate words limit for short note/short answer type questions except diagrammatical and numerical questions

Books Recommended:

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|----|---|-----------------------|
| 1. | Principles and Practices of Management | Shejwalkar |
| 2. | Essential of management | Koontz H & Weitrich H |
| 3. | Management Today Principles And Practices | Burton & Thakur |

4. PPM & OB- Nirali Publication
5. Mgmt. Principles and Functions
6. Organizational behavior
7. Organizational behavior
8. Organizational behavior
9. Organizational behavior

Dr. Vilas Nandavadekar
Ivancevich & Gibson, Donnelly
Stepheb Robbins
Keith Davis
Fred Luthans
Dr. Ashwatthapa

Note: Topic-wise list of books is given in the syllabus.

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MCA-I

Name of the Paper - **Cost and Financial Accounting** No. of Lectures: per week 4hrs

Course No. **BM-12*

Total Lectures : 40

Total Marks : 100

Semester- I

Objective : The financial aspect of business and management will be taught to student through this subject. This will benefit student in understanding and analysing financial statements of a business. Student will learn Financial Accounting, Managerial Accounting and Cost Accounting

Contents of the course

Unit No.	Name of the Topic	Details	Lectures/Period
1.	Financial Accounting	Double Entry Accounting system, Concepts and conventions in accounting, Accounting process, Depreciation , Journalisation , Rules for Journalisation, posting in a Ledger, subsidiary books, preparation of Trial balance, Bank Reconciliation Statement, Final Accounts ,Preparation of Trading and profit and loss , Account and Balance sheet of a Proprietary and partnership firms	16
2.	Cost Accounting	Advantages of Cost Accounting, Comparison with financial Accounting, Classification and elements of cost , Methods of costing Techniques, Marginal costing, Break-even chart, cost, Volume profit analysis, Standard costing, Advantages, Variance analysis,Budgetary Control –Types of budgets and Flexible Budget Vs Fixed Budget, Preparation of Simple cash budget & Flexible budgets ,Cost Reduction and cost control, value Analysis.	14

3.	Management Accounting	Concept of Management Accounting, Objectives of Management Accounting, Comparison with financial and cost accounting , Ratio Analysis Objectives, Advantages and limitations, preparation of ratios from given information ,Funds flow analysis and cash flow analysis - understanding the concept	10
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Nature of Question Paper :

- a) 20% marks - Objectives questions
40% marks – Short notes/ Short answers type questions
40% marks – Descriptive type questions

out of 20% marks for objectives questions 10% marks should be assigned to multiple choice questions and remaining 10% be assign to fill in the blanks or answer in one sentence etc. however each faculty may decide nature and type of questions to be set subject to distribution of above percentage of marks

- b) One descriptive type question will be compulsory. Paper setter should mention approximate words limit for short note/short answer type questions except diagrammatical and numerical questions

Recommended books:

- | | |
|-----------------------------------|--------------------|
| 1. Cost and Management accounting | Satish Inamdar |
| 2. Management Accounting | A.P. Rao |
| 3. Management Accounting | Dr.Sanjay Patankar |
| 4. Management Accounting | Khan and Jain |
| 5. Management Accounting | Dr.Mahesh Kulkarni |

Note: Topic-wise list of books is given in the syllabus.

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MCA-I

Name of the Paper - Discrete Mathematics

No. of Lectures: per week 4hrs

Course No. MT-11

Total Lectures : 40

Total Marks : 100

Semester- I

Objective : This is the first mathematics subject which revises the knowledge acquired previously by the student. Logic, Relations and Functions, Algebraic Functions and Graph Theory will be introduced in this course.

Contents of the course

Unit No.	Name of the Topic	Details	Lectures/Period
1.	Mathematical logic	Propositions (Statements) Logical connectivity's, N, A, V, \neg , \wedge , \vee Compound statements form, truth tables, tautology, implications and equivalence of statements forms logical identities Normal forms: disjunctive normal form and simplification. Conjunctive normal form, logical implications, valid arguments, methods of proof. Theory of inference of statement calculus, predicate calculus, qualifiers free and bound variables, theory of inference of predicate calculus.	10
2.	Relations and functions:	Relation defined as ordered n- tuple Unary, binary, ternary, n- ary Restrict to binary relations Complement of a relation, converse Relation , compositions, matrix representation and its properties Graphical representation of relation – Digraphs Properties of binary relation – Reflexive, irreflexive, symmetric, Asymmetric, transitive	14

		<p>Equivalence, equivalence classes, partitions covering, compatible relation maximal compatibility block, transitive closure– Warshall’s algorithm. Partial ordering relation – Hesse diagram, Chains and antichains. Lattice , maximal and minimal elements, upper bound , lower bound , definitions Functions – definitions: Partial function, hashing functions, characteristic functions, floor functions, ceiling functions, subjective control, injunctive (one-to-one) Inverse functions, left reverse, right inverse Bijection and cardinality of finite set Infinite sets and compatibility Properties of countable sets Non-denumerable sets.</p>	
3.	Algebraic structures:	<p>Operations on sets -Unary, binary, ternary definitions of algebraic systems (Restrict to binary operations) Properties – closure, idempotent, associative, communicative, associative, commutative, identity, inverse Semigroup, subsemigroup Monoid, submonoid group, abelian group, permutation group, multiplicatibe abelian group, cyclic group Subgroups: Cosets, right cosets, left cosets, normal subgroups, quotient groups, isomorphism, homomorphism, automorphism Group codes: Weight and Hamming distance, minimum distance of code , generation of codes using parity checks – even parity, odd parity , parity check matrix – Hamming code, for detection and correction errors , formation of encoding function, decoding Application of</p>	10

		residue –arithmetic to computers group codes	
4.	Graph theory: trees:	Basic terminology, simple and weighted graph, adjacency and incidence, hand-shaking lemma, underlying graph of a digraph, complete graph, regular graph , bipartite graph , complete bipartite Isomorphism, complement of graph, connected graphs , paths-simple , elementary , circuit – simple , elementary Edge connectivity, vertex connectivity Eulesian path and eulesian circuit , planner graph – regions Euler’s formula Trees : Definition – leaf , root , branch node , internal node Rooted and binary trees , regular m-ary tree	6

Note: Use of EXCEL, SPSS, MATLAB-Statistical Tool Box, etc. for Data Analysis is recommended.

Nature of Question Paper :

a) 20% marks - Objectives questions

40% marks – Short notes/ Short answers type questions

40% marks – Descriptive type questions

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b) One descriptive type question will be compulsory. Paper setter should mention approximate words limit for short note/short answer type questions except diagrammatical and numerical questions.

Reference books:

1. Discrete Mathematical Structures for Computer Science by Kolman B and Bushy R
2. Discrete Mathematical Structures with applications to Computer Science by Tremblay and Manohar
3. Discrete Mathematics by C L Liu
4. Discrete Mathematics by Rosen

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MCA-I

Name of the Paper - **Front-End Lab**

Course No. **IT 11L**

Total Practical : **20**

Total Marks : **50**

Semester- I

Objective: This will introduce visual programming and event driven programming practically. This will enhance applications development skill of the student.

Each session will be of 1 and 1/2 hours.

All the topics has to be covered with Lab Demos

Unit No.	Name of the Topic	Details
1.	Introduction	Event driven programming, Concept of GUI, Various VB- Editions, How to start with a project, Introduction of various windows: Properties Windows, Project Windows, Toolbox Windows, Menubar Windows
2.	The language	Variables, Data Types, Types of variables, Forcing variable declarations, lifetime & scope, Converting variable types User defined data types, Constants, Arrays, Declaring arrays, Multidimensional arrays, Inputbox() & MsgBox() functions, Control flow statements If...Then, If...Then...Else, Select, Loop statements Do....Loop, For...Next, While...wend Nested control structures, exit statement, Procedures, Subroutines, Functions, With Arguments, With return values Built In Functions - Date, String, Mathematical
3.	Controls with main Properties, Methods & Events	Label, Textbox, Basic properties, Text selection, Capturing key Strokes, Command box, Option, Check box, Combo, list box, Indexing with a ListBox, Searching a sorted list, Scroll bars & slider controls, Timer, Dir, File, Drive list boxes, The remaining controls like shape, image, picture etc.
4	Designing the user interface	Placing the controls on form Aligning & grouping controls Setting focus, writing code with code design window Saving & running the application
5	Advanced ActiveX controls	The common dialog controls Color, Font common dialog boxes The FileOpen &

		FileSave common dialog boxes The Print, Help common dialog boxes, The Tree & List view controls, How tree structure works Using the Tree view, List view control, RichTextBox control MSFlex-grid control - Basic properties
6	The multiple document interface	MDI Applications- the basic Built-in capabilities of MDI, Parent & Child menus, Accessing Child forms, Adding, loading, unloading forms, Creating menus with Menu Editor, assigning the keys etc.
7	Database programming & Error Handling	Understanding Databases & Database Management Systems Record sets, Accessing fields in database Data Control – Properties, Methods Advanced Data bound controls, Using Visual Data Manager, Database Connectivity with controls ADO, Establishing connection, Executing SQL stmts. Cursor types & locking mechanisms, Manipulating Record set object. Simple record adding & editing, Database Connectivity using code, Grid controls- Flex grid, Data grid, Handling errors
8	Reports	Data & Crystal reports, Simple reports with proper formatting, GroupWise reports
9	Introduction of Creating DLL in VB.	
10	Making EXE File	

Lab Work for VB

VB introduction

- a. Start a new project
- b. Open tools, properties & project explorer window
- c. Change the name of project
- d. Change name & title of form & save it.
- e. Set the following, save the form & run it
 - I Height & width
 - li BorderStyle property to Fixed Dialog
 - lii WindowState property to maximized
 - lv StartUpPosition property to center
 - V Moveable property to false
 - Vi Font & foreground color

VB-The language

- a. Declare two variables. Accept the values using InputBox() & display the result on form.
- b. Accept 10 numbers in array, display minimum & maximum number.
- c. Display first odd numbers & store them in array.
- d. Accept numbers in array, take a number to search in an array, find the number of times that number is occurred in array.

Inputbox() & MsgBox() functions

- a. Accept a name from user & display hello in msgbox()
- b. Accept one number using inputbox() & display its factorial in msgbox()

Control flow statements & loops

- a. Accept a username & password using InputBox() check whether it is Scott & tiger resp., display valid user names else display proper error message.
- b. Accept a number, display whether it is odd or even number
- c. Accept a character, check whether it is a alphabet, number or special symbol.
- d. Accept a number, display its Armstrong no.
- e. Create a Fibonacci series for 10 numbers
- e. Accept a number check, whether it is prime or not.

Built in functions

- a. Display today's date with day, day name , month & year
- b. Accept a date from user, check whether the year is lap or not.
- c. Accept a date, check date validations.
- d. Display the date after 45 days from current date.

Procedures

- a. Write a procedure to display hello & welcome message when form loads
- b. Write a procedure to display Thank you message when form unloads

- c. Write a function max(a,b,c) which will return maximum of 3 numbers.
- d. Write a function pyramid() which will accept a string & will display the string pyramid.
- e. Write a function rev(a) to reverse a number
- f. Write a function srev() to reverse a string.

VB basic controls with main properties, methods & events

- a. Add the label, change its name as lblmsg, On the form load event , display the message on label as Welcome
- b. Add a text box & a label in form, after selecting a text in textbox, display the selected text on label
- c. Add a text box& label on form, display the ASCII values of character typed in a textbox on a label.
- d. Accept a color name in text box. Display the forms background color as per the name of the color.
- e. Accept a message, encrypt it by key 2, display.
- g. Accept a String in text box; find out number of letters, numbers, and special symbols in a string.

Command box

- a. Add a command box with Caption OK. When user clicks on it change to KO and vice-versa
- b. Display the command button with a File-save icon on it.
- d. Create a calculator, which will perform basic arithmetic operations like add, subtract, multiply, divide etc.

Option, Check box

- a. Develop a screen with 4 check boxes for hobbies & one button. After clicking on a button display the hobbies selected.
- b. Design an application, with 9 checkboxes from 0 to 9 & one button Add. After clicking on Add, display the sum of digits selected.
- c. Design a screen with 3 radio buttons for 3 different colors. If any one of them selected, change the background color as per the selected color.
- e. Accept two numbers from user. Using radio buttons display options like calculate Minimum, Maximum, average

Combo, list box

- a. Design an application with a text box & a Combo box, & some command buttons .
 - 1. On click of Add button, add text in text box to combo.
 - 2. On click of Delete button, the selected entry should get deleted from combo.
 - 3. on click of any above buttons display total number of final items in list.
- b. Design an application with a list box having names of Operating Systems.
 - 1. Allow user to select multiple entries

2. On click of Display button show os selected.
3. On click of delete, delete the selected names.
- c. Design an application with 2 list boxes, with buttons Transfer one, all after clicking on buttons transfer either selected items or all items to 2nd list box & vice versa.
- d. Design an application for formatting the Text entered in a text box. Add Combo for Font name & size. Add B, I, U command buttons. As per the font name, size & formatting options selected display the text. The buttons should be toggle. Once clicked effect should be enable or disable.

Scroll bars

- a. Add a horizontal scroll bar for a font size, with minimum 10 & maximum 72 points size. As per the scroll movement increase/decrease the size of text font by one.
- b. Create 3 scrollbars for colors Red, Green, Blue. The range of values be from 0 to 256. As per values of scrollbars change the color of label.
- c. Add one scroll bar. Display the current value of the scroll bar in text box.

Timer

- a. Design an application that will set timer interval as 10 And will display any one image of the 2 images.
- b. Using timer design a traffic signal application.
- c. Display a running clock in a text box.

Dir, File, Drive list boxes

- a. Design an application with directory; File & Drive list boxes, as per the drive-selected display the names of directories & subdirectories in list box. After selecting directory display all files within that directory.
- b. Display all files with extension .BMP.

Using all above controls designed applications for handling Employee data, Student Data, Books data.

Advanced Activex Controls

- a. Design an application with 2 buttons File – Open & File –Save. As per the button click display the Dialog boxes & name of the file seleted.
- b. Write a Notepad application using RichTextBox Control.

MDI forms

- a. Create one MDI form, Add 3 child forms. Design a menu to arrange all the forms in Cascading, tile form.
- b. Design a menu of Edit with Cut, Copy, Paste, select all options. Assign shortcut Keys & hot keys.
- c. Design an application for nested menus.

Database Programming

Using DAO

- a. Display all records of Emp table in text boxes.
- b. Create an application to Add, Delete, Modify employees (using code)
- c. Display all the records of employees working in deptno 20.
- d. Display all the records in Grid.
- e. Create an application using Visual Data Manager.

Using ADO

- a. Create an application, to scroll through the database records. use DSN with ADO Control.
- b. Write the same application using code.
- c. Write an application for book entry,
 - i. That allows entering new book details like book name, author, publication, edition, price etc., will generate bookid auto. Adds the records in db
 - ii. After selecting name of author display all the books with details having the same author.
 - iii. Display the book details as per the price range entered by user.
 - iv. Display all book details in MSFlex grid.

Create proper reports using Data/Crystal reports.

Nature of Evaluation For Lab work :

20% marks – Based on laboratory work

40% marks – Programming questions and actual practical exam

40% marks – viva voce exam based on lab assignments

Note: All the assignments are mentioned using Visual Basic as the front end tool. Institutes may use any other front-end tool as per availability.

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Revised New Syllabus
MCA-I

Name of the Paper - C Programming Lab

Course No. IT12L

Total Practical : 20

Total Marks : 50

Semester- I

Objective : This will give hands on practice to student about programming language C and will inculcate programming habit in them.

Lab Work:

1. Find Area, Perimeter of Square & Rectangle.
2. Find max. Among 3 nos.
3. Check leap year
4. Factorial of Number
5. Calculate a^b
6. Prime Number.
7. Perfect Number.
8. Armstrong Number.
9. Floyd's Triangle
10. Fibonacci Series
11. Inter conversion of Decimal, Binary & Hexadecimal no.
12. LCM & GCD of numbers
13. Insert & Delete an element at given location in array.
14. Transpose of matrices
15. Multiplication of matrices
16. Display upper & lower diagonal of matrices
17. Array of Structure e.g. student result, Employee pay slip , Phone bill
18. Function with no parameter & no return values
19. Function with parameter & return values
20. Function with parameter & no return values
21. Function with call by reference
22. Recursion function e.g. sum of digit, reverse of digit
23. String manipulation function e.g. string copy, concatenation, compare, string length, reverse
24. Pointer Arithmetic
25. File handling e.g. Read / Write file, copy file, merging file
26. Random access of file
27. File handling with command line arguments
28. Drawing line, rectangle, circle, ellipse by using graph
29. Changing foreground/ background color
30. Changing color & font of text
31. Swapping of numbers by using bit wise operator.

- 32. Macro expansion
- 33. File Inclusion
- 34. IO interfacing & Device Driver using C.

Nature of Evaluation For Lab work :

20% marks – Based on laboratory work

40% marks – Programming questions and actual practical exam

40% marks – viva voce exam based on lab assignments

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Revised New Syllabus

MCA-I

Name of the Paper - Data Structure Using C

No. of Lectures: per week 4hrs

Course No. IT-21

Total Lectures : 40

Total Marks : 100

Semester- II

Objective : The basic algorithms related to handling data like stack, lists, queue, trees and graphs are introduced in this subject. The implementation of these algorithms will be taught using previously learned C programming language.

Contents of the course

Unit. No.	Name of Topic	Details	periods
1.	Introduction To Data Structure	Introduction, Data Definition, Data Object, Data Types, Built-in Data Type, Derived Data Type, Data Structure, Implementation of Data Structure	3
2.	Array	Array as Data Structure, Storage Representation of Arrays, Applications of Arrays, Polynomial Representation Using Arrays, Addition of Two Polynomial, Multiplication of Two Polynomial, Sparse Matrices, Addition of Sparse Matrices, Transpose of a Sparse Matrix	4
3.	Linked List	Introduction, Drawback of Sequential Storage, Concept of Linked List, Implementation of Linked List, Operation of Linked List , Creating a List, Displaying a List, Inserting an element in the List, Deleting an element, Other Operation & Applications, Reversing a Linked List, Concatenation of Two Lists, Representation of Polynomial, Circular Linked List & Operation, Doubly Linked List & Operation, Doubly Circular Linked List & Operation, Difference between an	6

		array and Linked, List, Generalized Linked List, Header Linked List	
4.	Stack	Introduction, Definition, Operation on Stack, Static & Dynamic Implementation of a Stack, Application of Stack, Recursion, Infix, Prefix & Postfix expression, Matching Parentheses in an, Expression	6
5.	Queue	Introduction, Definition of a Queue, Operation on a Queue, Static & Dynamic Implementation of Queue, Types of Queue, .Circular Queue, Priority Queue, DEQueue. Application of Queue, .Job Scheduling, Reversing Stack using Queue	5
6.	Tree	Tree Terminology ,Binary Tree, Binary Tree Representation, Binary Search Tree (BST), Creating a BST, Binary Search Tree Traversal, Preorder Traversal, Inorder Traversal, .Postorder Traversal	4
7.	Binary Threaded Tree	AVL tree, B tree, introduction to B tree , insertion in B tree, deletion from B tree, introduction to B+, B* tree, Expression Tree, Threaded Binary Tree	6
8.	Graph	Introduction , Graph Representation, Adjacency Matrix, .Adjacency List, Graph Traversals, Depth First Search, Breadth First Search, Applications of Graph	6

Nature of Question Paper :

a) 20% marks - Objectives questions

40% marks – Short notes/ Short answers type questions

40% marks – Descriptive type questions

out of 20% marks for objectives questions 10% marks should be assigned to multiple choice questions and remaining 10% be assign to fill in the blanks or answer in one sentence etc. however each faculty may decide nature and type of questions to be set

subject to distribution of above percentage of marks

b) One descriptive type question will be compulsory. Paper setter should mention approximate words limit for short note/short answer type questions except diagrammatical and numerical questions.

References:

1.C & Data Structure	Balagurusamy
2.Data structure and program design in c	R.L.Kruse
3.Data Structure through C	Y.P. Kanetkar
4.Data Structure through C in depth	Shrivastava & Shrivastava
5.Data Structure	Seymour Liptsuz
6.Data Structure	Tannebaum

Note: Topic Wise list of books is given

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Revised New Syllabus

MCA-I

Name of the Paper - Database Management System No. of Lectures: per week 4hrs

Course No. IT-22

Total Lectures : 40

Total Marks : 100

Semester- II

Objectives:. The concepts related to database, database techniques, SQL and database operations are introduced in this subject. This creates strong foundation for application data design.

Course contents

Sr. No.	Name of topic	Details	Lectures/periods
1.	Basic concepts	Database and Need for DBMS , Characteristics of DBMS ,Database Users , 3-tier architecture of DBMS (its advantages over 2-tier) ,Data Models , Views of data- schemas and instances, Data Independence ,Conventional data models & systems ,NDM & HDM- Expressing relationships, DBTG set	6
2.	Database Design using ER model	Entities , Relationships , Representation of entities, attributes, relationship attributes, relationship set , Generalization, aggregation , Structure of relational Database and different types of keys , Expressing M: N relation	8
3.	Relational Model	Codd's rules , Relational data model & relational algebra ,Relational model concept ,Relational model constraints, Relational Algebra , Relational database language , Data definition in SQL, Views and Queries in SQL, Specifying constraints and Indexes in SQL, Specifying constraints	5

		management systems, Oracle, Ingres	
4.	Relational Database design	Database Design – ER to Relational, Functional dependencies , Normalization , Normal forms based on primary keys (1 NF, 2 NF, 3 NF, BCNF, 4 NF, 5 NF) , Loss less joins and dependency preserving decomposition	8
5	Storage and File Structure	Overview of physical storage media, Magnetic disk , RAID , Tertiary storage, Storage access , File organization , Organization of records in files , Data dictionary storage	3
6	Transaction And Concurrency control	Concept of transaction, ACID properties , Serializability , States of transaction, Concurrency control , Locking techniques , Time stamp based protocols , Granularity of data items, Deadlock	4
7	Crash Recovery and Backup	Failure classifications , storage structure , Recovery & atomicity , Log base recovery , Recovery with concurrent transactions , Failure with loss of Non-Volatile storage , Database backup & recovery from catastrophic failure , Remote Backup System	4
8	Security and privacy	Database security issues , Discretionary access control based on grant & revoking privilege , Mandatory access control and role based access control for multilevel	2

		security ,Encryption & public key infrastructures	
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Nature of Question Paper :

- a) 20% marks - Objectives questions
- 40% marks – Short notes/ Short answers type questions
- 40% marks – Descriptive type questions

out of 20% marks for objectives questions 10% marks should be assigned to multiple choice questions and remaining 10% be assign to fill in the blanks or answer in one sentence etc. however each faculty may decide nature and type of questions to be set subject to distribution of above percentage of marks

- b) One descriptive type question will be compulsory. Paper setter should mention approximate words limit for short note/short answer type questions except diagrammatical and numerical questions.

Reference:

1. Introduction to database systems	C.J.Date
2. Database system concept	Korth
3 Principles of Database Management	James Martin
4 Computer Database organization	James Martin
5. Fundamentals of Database Systems	Elmasri Navathe
6.Object-oriented modeling and design	Rumbaugh and Blaha
7. Object-oriented analysis and design	Grady Booch
8.Database Management Systems	Bipin Desai
9. Database system practical Approach to design, implementation & management	Connoly & Begg
10. Database Management systems	Ramakrishnan & Gehrke

N. B:

- 1. PL/SQL to be covered as lab sessions
- 2. Oracle Lab will be covered as Lab demo sessions.
- 3. Relational Calculus need not be covered in depth.

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MCA-I

Name of the Paper - Software Engineering

No. of Lectures: per week 4hrs

Course No. IT-23

Total Lectures : 40

Total Marks : 100

Semester- II

Objectives:. Software Systems Analysis and Design, Analysis and Design Models and Techniques, recent trends and methods will be taught to student . The repetition in previous syllabus is removed in this course, integrating ISAD and SE subject in one. This subject develops systematic approach for development of application in students.

Course contents

Sr. No.	Name of the topic	Details	Periods
1.	Overview of systems Analysis and design	Basic System Development Life Cycle , Different approaches and models for System Development: Waterfall , Prototyping , Spiral (including WIN-WIN Spiral) ,, RAD , Group Based Approach: JAD , Object Oriented methodology , Role & Skills of system Analyst	5
2.	Activities in Requirements Determination	Requirements Anticipation , Requirements Investigation, Fact finding methods , Requirements Specifications , Software requirement Specification (SRS), Structure and contents of the requirements , Specification analysis modeling, types of requirements - functional and non-functional, Quality criteria, requirements definition, SRS format, Fundamental problems in defining requirements	9
3.	Information requirement Analysis	Decision Analysis Tools: Decision Tree, Decision Table,	9

		Structured English , Functional decomposition Diagram ,Process modeling with physical and logical Data Flow Diagrams , Entity Relationship Diagram: Identify Entity & Relationships , Data Dictionary , Case Studies on Decision analysis tools FDDs, DFDs should be covered	
4.	Systems Design	Design of input & Control, Objectives of Input Design, Data Capture Guidelines , Design of Source Document, Input Validations , Design of output, Objectives of Output , Design Types Of Output ,User interface design: Elements of good design, design issues, features of modern GUI, Menus, Scroll bars, windows, buttons, icons, panels, error messages etc, Design of program Specification , Code Design , Case studies should be covered on the Topic	8
5.	Maintenance	Types of Maintenance , Maintenance Cost , Reverse Engineering, Introduction to legacy systems , Role of documentation in maintenance and types of documentation	3
6.	CASE TOOLS	Introduction to CASE tools, Types of CASE tools , Project Management Tools, Analysis tools, Design tools, Programming tools, Prototyping tools, Maintenance tools, Advantages and disadvantages of CASE tools	3
7.	Current trends in Software Engineering	Software Engineering for projects & products , Introduction to Web Engineering and Agile process	3

Nature of Question Paper :

- a) 20% marks - Objectives questions
40% marks – Short notes/ Short answers type questions
40% marks – Descriptive type questions

out of 20% marks for objectives questions 10% marks should be assigned to multiple choice questions and remaining 10% be assign to fill in the blanks or answer in one sentence etc. however each faculty may decide nature and type of questions to be set subject to distribution of above percentage of marks

- b) One descriptive type question will be compulsory. Paper setter should mention approximate words limit for short note/short answer type questions except diagrammatical and numerical questions.

References :

- | | |
|--|-----------------|
| 1. Software Engineering | Pressman |
| 2. System Analysis and Design | Jalote |
| 3. Software Engineering | Sommerville |
| 4. Software Engineering | W S Jawadekar |
| 5. System Analysis & Design methods | Whiten, Bentley |
| 6. System Analysis & Design | Elias Awad |
| 7. Object Oriented Modeling & Design | James Rumbaugh |
| 8. Analysis & Design of Information System | James Senn |
| 9. Analysis & Design of Information System | V. Rajaraman |
| 10. Software Engineering Concepts | Richard Fairley |

Note: Topic wise list of books is given

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Revised New Syllabus

MCA-I

Name of the Paper - **Soft Skills**

No. of Lectures: per week 4hrs

Course No. **BM 21**

Total Lectures : 40

Total Marks : 100

Semester- II

Objectives: : 1. To encourage the all round development of students by focusing on soft skills.

2. To make student aware about the importance, the role and the content of soft skills through instruction, knowledge acquisition, and practice.

3. To develop and nurture the soft skills that help develop student as a team member, leader, and all round professional in long run have been identified and listed here for references. As the time professional in long run have been identified and listed here for references the time allotment for the soft skill laboratory as small and the fact that the skills are nurtured over years, students are encouraged to follow these skills as self study and self driven process

Sr. No.	Name of topic	Details	Periods
1.	Self Development and Assessment	Self-Assessment ,Self-Awareness, Perception and Attitudes , Values and Belief System , Personal Goal Setting , Career Planning, Self-Esteem, Building of Self-Confidence	8
2.	Components of communication	Principles of communication barriers, listening skills ,Verbal Communication ,Includes Planning , Preparation ,Delivery,Feedback and Assessment of activities like a. Public speaking b. Group Discussion c. Oral Presentation Perfect Interview d. Listening and observation skills, Body language Use of Presentation graphics, Use of Presentation aids, Study of communication.	10
3.	Written	Technical Writing–Technical	10

	Communication	Reports , Project Proposals, Brochures, Newsletters, Technical Articles , Technical Manuals , Official/Business Correspondence a. Business letters b. Memos c. Progress report, Minutes of meeting, Event reporting, d. Use of: Tools, Guidelines for technical writing	
4.	Ethics and Etiquettes	Business Ethics , Etiquettes in social as well as Office settings , Email etiquettes , Telephone Etiquettes , Engineering ethics and ethics as an IT professional, Civic Sense.	6
5.	Other Skills	Managing time , Meditation , Understanding roles of Engineer and their Responsibility , Exposure to work environment And culture in today's job Places , Improving Personal Memory, Study skills that include Rapid reading, Notes taking, Complex problem solving, Creativity	6

Nature of Question Paper :

a) 20% marks - Objectives questions

40% marks – Short notes/ Short answers type questions

40% marks – Descriptive type questions

out of 20% marks for objectives questions 10% marks should be assigned to multiple choice questions and remaining 10% be assign to fill in the blanks or answer in one sentence etc. however each faculty may decide nature and type of questions to be set subject to distribution of above percentage of marks

b) One descriptive type question will be compulsory. Paper setter should mention approximate words limit for short note/short answer type questions except diagrammatical and numerical questions.

References for students for self-improvement by self-study

Topic 1 : Any good book like

1. You Can Win – Shiv Khera – Macmillan Books – 2003 Revised Edition
2. 7 Habits of Highly effective people – Stephen Covey
3. Business Communication? Asha Kaul
4. Business Communication - M. Balasubramanyam

Topic 2 and 3:

1. John Collin, "Perfect Presentation", Video Arts MARSHAL
2. Jenny Rogers " Effective Interviews", Video Arts MARSHAL
3. Raman Sharma, " Technical Communications", OXFORD
4. Sharon Gerson, Steven Gerson "Technical writing process and product", Pearson Education Asia, LPE third edition.
5. R. Sharma, K. Mohan, Business correspondence and report writing", TAG McGraw Hill ISBN 0-07-044555-9
6. Video for technical education catalog, National education and Information Films Ltd. Mumbai.
7. Management training and development catalog, National education and Information Films Ltd. Mumbai.
8. XEBEC, "Presentation Book 1,2,3", Tata McGraw-Hill, 2000,ISBN 0-40221-3

Topic 4 and 5:

1. Tim Hindle, "Reducing Stress", Essential Manager series Dk Publishing
 2. Sheila Cameron, "Business student Handbook", Pitman Publishing
 3. Dr. R. L. Bhatia, " Managing time for competitive edge"
 4. Lorayne Lucas "Memory Book"
 5. Robert Heller, "Effective leadership", Essential Manager series Dk Publishing
 9. Newstrom Keith Davis," Organizational Behavior", Tata McGraw-Hill, 0-07-460358-2
- It is proposed that expert from industry be invited to conduct lectures and workshops to understand the industry soft-skill requirement.

Guidelines for term-work: Marks 50

List Of Possible Assignments

1. Write a personal essay and or resume or statement of purpose which may include:
 - Who am I (family background, past achievements, past activities of significance)
 - Strength and weakness (how to tackle them) (SWOT analysis)
 - Personal Short-term Goals, long-term goals and action plan to achieve them
 - Self-assessment on soft-skills
2. Student could review and present to a group from the following ideas
 - Book review
 - Biographical Sketch
 - Any topic such as an inspirational story/personal values/beliefs/current topic
 - Ethics and etiquettes and social responsibilities as professional.
- 3 Student will present to a group from the following ideas

- Multimedia based oral presentation on any topic of choice
(Business/Technical)
- Public speaking exercise in the form of debate or elocution on any topic of Choice
- 4 Student will undergo two activities related to verbal/non-verbal skills from Following
 - Appearing for mock personal interviews
 - Participating in group discussion on current affairs/Social Issue/ethics and etiquettes
 - Participating in games, role-playing exercises to highlight nonverbal skills.
- 5 Student will submit one technical document from the following:
 - Project proposal
 - Product brochure
- Literature survey on any one topic
 - User Manual
 - Technical Help
- 6 Student will submit one business document from the following
 - A representative official correspondence
 - Minutes of meeting
 - Work progress report
- 7 Students will participate in one or two activities from following:
 - Team games for team building
 - Situational games fro role playing as leaders, members
 - Organizing mock events
 - Conducting meetings
- 8 Faculty may arrange one or more sessions from following :
 - Yoga and mediation
 - Stress management, relaxation exercises and fitness exercises
 - Time management and personal planning sessions
 - Improving memory skills
 - Improving leadership skills
 - Improving English conversation skills
 - Reading comprehension skills & notes taking skills
- 9. Students' own SWOT Analysis

Students are expected to keep a personal record of any six activities that they conduct in the soft skill laboratory in the form of a journal. All students need note to do the same assignments. Institute having a freedom within the framework to customize set of activities to be followed.

Assessment Guidelines for term-work assessment

1. Written Communications
 - Students could submit for example
 - Personal resume, essay
 - Technical document or business document
2. Spoken communication

- One elocution event of say 8-10 minutes individually
- One group discussion or group presentation event
- 3. Overall participation in soft skills based lab activities
 - Attendance and enthusiasm
 - Participation and contribution in event management, organizing
 - Group games, group exercises, interpersonal skills observed
 - Quality of journal for soft skills laboratory indicating personal progress, participation.

Guidelines for batch wise Time management for laboratory sessions (Two hour session at a time)

1. Batches could be of size 25 to 30 students.
2. Written communication exercises could be done for whole batch at same time. (3 sessions)
3. Spoken communications exercises can be done with around 10-15 students covered in one two hour slot so total need for exercises. (2 sessions).
4. Group discussions could be done for groups of 5-8 students at a time for half so (2 sessions)
5. Sessions could be organized for trainers to give directions, knowledge, experience sharing or common viewing of training material on Video etc. (4 sessions)
6. Group exercises for team building, role playing and interaction with professional. (3 sessions)

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Revised New Syllabus

MCA-I

Name of the Paper - **Business Processes Domains**

No. of Lectures: per week 4hrs

Course No. ***BM 22**

Total Lectures : 40

Total Marks : 100

Semester- II

Objectives: : The processes and practices in business and their applications are taught in subject. The advance business applications like ERP, CRM and SCM are also introduced to student. This helps student in design computerized business applications with better understanding.

Course contents

Sr. No.	Name of topic	Details	Periods
1	Sales & Distribution	Sales Budgeting-Market ,Segments/Customers/Products , Pending Customer Order's follow up ,Sales Analysis While explaining this application consider an organization manufacturing multiple products with sales outlets spread across the country Retail Marketing- New trends – Growth	10
2	Human Resource	Employee Database , Recruitment - Techniques , Employee Appraisal – Performance-efficiency , Employee Training- multiple training , Leave Accounting and Payroll: Salary calculation and reporting, Income Tax, Calculation and Reporting, Loan Accounting, PF and gratuity, Bonus, Ex-Gratia, Incentive, Super-annuation, Arrears Calculation E-HR Software	10
3.	Banking and Healthcare	Saving Bank Accounting – Real time, ATM and E-Banking , Biotech Industry & Scope	5
4.	Advanced Business Systems	Enterprise Resource Planning : Evolution, Scope, What is ERP? Why ERP? Package ERP solution Vs Custom development Features of ER, Different modules of ERP, How ERP Works? Pre-requisites for implementing ERPBPR/BPM, ERP Implementation- Issues methodologies, Selection of ERP	12

		<p>Software , Supply chain Management (SCM) , Demand forecasting and Planning , Distribution inventory planning and Plant capacity, planning and scheduling , Integration with ERP , Technologies used such as EDI, Web ,Customer Relationship Management</p> <p>(CRM): CRM covers marketing, Sales And service functions of a company , CRM Process customer ,Acquisition / Development , Retention , Call center/ Knowledge Center , International Business Management – Basic concept : Market potential & opportunities., Competitive advantage Introduction to exchange</p>	
5.	Multinational & Indian Companies	.Birds eye view of- Multinational Companies and Indian Comp in software industry: like TCS, Wipro, Infosys, Microsoft, Oracle, Vodafone	3

Nature of Question Paper :

a) 20% marks - Objectives questions

40% marks – Short notes/ Short answers type questions

40% marks – Descriptive type questions

out of 20% marks for objectives questions 10% marks should be assigned to multiple choice questions and remaining 10% be assign to fill in the blanks or answer in one sentence etc. however each faculty may decide nature and type of questions to be set subject to distribution of above percentage of marks

b) One descriptive type question will be compulsory. Paper setter should mention approximate words limit for short note/short answer type questions except diagrammatical and numerical questions.

References :

- | | |
|---|----------------|
| 1. Production and Operation Management | Mayer |
| 2. Personnel Management | C B Mammoria |
| 3. Enterprise Resource Planning and Business Process | M M Sahikh |
| 4. Business Applications | Dr. Milind Oka |
| 5. Website of the said companies in Chapter 5 for general information | |
| 6. Business India, India Today Magazines | |

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Revised New Syllabus

MCA-I

Name of the Paper - **Probability & Combinatorics**

No. of Lectures: per week 4hrs

Course No. **MT21**

Total Lectures : 40

Total Marks : 100

Semester- II

Objective : Permutations and Combinations, Principle of Inclusion & Exclusion, Recurrence Relations-Linear, Probability & various distributions and exclusion will help student to know statistical techniques much better.

Course contents

Sr. No.	Name of topic	Details	Periods
1	Permutations & Combinations	Addition principle, multiplication principle, Bijection principle, r-permutations of n-elements, r-combination of n-elements, binomial coefficients, circular permutations, permutations with repetitions, Multinomial theorem, combinations with repetitions, Distribution of objects- 1. Distinct objects in distinct cells 2. Indistinguishable objects in distinct cells 3. Distinct objects in, indistinguishable cells 4. Indistinguishable objects in distinguishable cells	10
2	Linear Equation	Number of non-negative integer solutions of linear equations with conditions Binomial identities	4
3.	Principle of Inclusion & Exclusion	Formula Derangement- restrictions on relative positions Generating functions for discrete numeric functions, for combinations	4

4.	Recurrence Relations-Linear	Homogeneous,non-homogeneous,pigeonhole principle	4
5	Probability	Sample space, events, different approaches,conditional probability, Baye's rule, Random variables, univariate & bivariate Discrete Distributions Binomial, Poisson, Negative Binomial,Geometric, hyper geometric, zeta, Distributions Continuous Distributions, Uniform, normal, Erlanggamma, exponential, Ray Leigh laplace, cauchy Marginal & conditional distributions For the above discrete distribution definition of r.v and derivation of its p.m.f. is expected. For the continuous distributions p.d.f. should be defined Special properties of the distribution (if any) should be tested.	10
6	Expectation	Expectation of R.V, expectation of a function of a r.v. should be defined . For all the above distributions using these definitions mean & variance should be obtained.	4
7.	Moment generating function & its properties	Finding mean & variance using m.g.f. cumulant generating function, cumulants properties, finding mean & variance using cumulants, characteristic function-properties, finding mean & variance	4

Nature of Question Paper :

a) 20% marks - Objectives questions

40% marks – Short notes/ Short answers type questions

40% marks – Descriptive type questions

out of 20% marks for objectives questions 10% marks should be assigned to multiple choice questions and remaining 10% be assign to fill in the blanks or answer in one sentence etc. however each faculty may decide nature and type of questions to be set subject to distribution of above percentage of marks

b) One descriptive type question will be compulsory. Paper setter should mention approximate words limit for short note/short answer type questions except diagrammatical and numerical questions.

References :

For Probability

1. A first course in Probability Ross S.
2. Probability & Random Process T.Veerarajan

For Combinatorics

3. Discrete Mathematics Modak Andor Boxwala(BSC Computer)
4. Combinations Modak Andor Boxwala
5. Discrete Mathematics C.L. Liu

Note: Topic wise list of books is given

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MCA-I

Name of the Paper - **Data Structure Using C Lab** No. of Lectures: per week 4hrs

Course No. **IT21L**

Total Lectures : 20

Total Marks : 50

Semester- II

Objective : : The practical implementation of data structure will be done by students through this lab work, which will built efficient programming skills in students.

Lab Work:

1. Addition and Multiplication of Two Polynomials.
2. Addition and Transpose of Sparse Matrices.
3. Singly Linked List: Create, Display, Insertion, Deletion, Search, Reverse
4. Singly Circular Linked List: Create, Display, Insertion, Deletion, Search,
5. Doubly Linked List: Create, Display, Insertion, Deletion, Search, Reverse
6. Stack Implementation
7. Stack Application: Inter conversion of Infix, Prefix & Postfix
8. Stack Application: Palindrome & Matching Parenthesis.
9. Queue Implementation
10. Queue Application: Job Scheduling.
11. Binary Search Tree Implementation: Creation, Insertion, Deletion, Copy, Mirror, Traversal (Preorder, Post order, In order).
12. Graph Application: Depth First Search, Breadth First Search, And Shortest Path Algorithm.

Nature of Evaluation For Lab work :

- a) 20% marks – Based on laboratory work
- 40% marks – Programming questions and actual practical exam
- 40% marks – viva voce exam based on lab assignments

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MCA-I

Name of the Paper - DBMS Lab

Course No. IT22L

Total Lectures : 20

Total Marks : 50

Semester- II

Objective : Through this lab work will enhance database handling, data manipulation and data processing skills through SQL & PL/SQL, which will help them in developing data centric computer applications.

Course contents

Unit No.	Name of topic	Details
1	Introduction	Overview of RDBMS, Oracle introduction
	Introduction of SQL	DDL, DML, DTL Basic Data Types Char, varchar/varchar2, long, number, Fixed & floating point Date, CLOB, BLOB
	Table	Constraint definition Commands to create table
	Commands for table handling	Alter table, Drop table, Insert records
	Commands for record handling	Update, Delete Select with operators like arithmetic, comparison, logical Query Expression operators Ordering the records with orderby Grouping the records
	SQL functions	Date, Numeric, Character, conversion Group functions avg, max, min, sum, count
	Set operations	Union, Union all, intersect, minus
	Join concept	Simple, equi, non equi, self, outer join
	Query & sub queries	
	Synonym introduction, object type	Create, synonym as alias for table & view, drop
	Sequence	Introduction, alter sequence, drop
	View	Intro, create, update, drop
	Index	Introduction, create
	Primary introduction to DBA	User create, granting privileges (Grant, Revoke, Commit, Rollback, Savepoint)

	Report writer using SQL	Title, Btitle, skip, pause, column, SQL, Break on, computer Sum
	Introduction of PL/SQL	Advantages of PL/SQL Support of SQL Executing PL/SQL
	PL/SQL character set & Data Types	Character, row, rowed, Boolean, binary integer, number Variable, constant
	PL/SQL blocks	Attribute % type, %rowtype, operators, function comparison numeric, character, date Control structure Condition – if Interactive- loop, for, while Sequential – goto
	Composite data types	Record- declaration, refer, record assignment Table- Declaration, table attributes (Count, delete, exists, first, last, next, prior)
	Database Triggers	Definition, syntax, parts of triggers Types of triggers, enabling & disabling triggers
	Sub programs	Definition Features Cursors
	Procedures	Definition, creating, Parameter
	Function	Definition & implementation

Lab work

Exercise1

1. Create table Salespeople with fields snum, sname, city, commission
2. Orders table with field's onum, odate, snum, amt
3. Customers table with field's cnum, cname, city, rating, snum

Exercise 2

1. Add at least 10 records
2. Display all the records with all sales peoples information.
3. Display the details of fields sname, commission
4. Display the odate, snum, onum, amt from orders table.
5. Display snum from orders table without duplications.
6. Display name & city of salesman where city is "Pune"
7. Display all details of customer where rating is 100.

8. Display all details from customer table where salespersons number is 1001.
9. Display the numbers of sales persons, with orders currently in the orders table without any repeats.
10. Display all customers where rating is more than 200
11. Display all customers where city is 'Mumbai' rating is more than 100.
12. Display all customers where city is either 'Pune' or 'Mumbai'
13. List all customers not having city 'Pune' or rating more than 100
14. List all orders between order dates 10/03/05 to 30/3/05
15. Display all orders more that 1000 amt.
16. Display names & cities of all salespeople in 'Pune' with a commission above 10.
17. Display all customers excluding those, with rating less than equal to 100, unless they are located in 'Nagar'
18. Display all sales persons names starting with character 'G'
19. Display all sales persons names starting with character 'G', the 4th character is 'A' & the rest of characters will be any.
20. Find all records from customers table where city is not known i.e. NULL.
21. Display all the customer's names begins with a letter A to G.
22. Assume each salesperson has a 12% commission on order amt. Display orderno, snum, commission for that order.

Exercise 3

1. Display all the customers' records, arranged on name.
2. Display all customers records arranged on rating in desc. Order.
3. Display all sales persons records arranged on snum
4. Display the count for total number of customers in customers table.
5. Display the count of snum in order table without duplication of snum.
6. Display the counts of all orders for Feb05
7. Display the count of different non-NULL city values in the customer's table.
8. Display the maximum outstanding amount as blnc+amt
9. Display the minimum rating within customers table.
10. Display average of amt.
11. Display sales persons number wise maximum amt from order table.
12. Display the largest order taken by each salesperson on each date.
13. Display the details of maximum orders above 3000.
14. Display details of orders order number & date wise
15. Display customer's highest ratings in each city.
16. Write a query that totals the orders for each day & places the results in descending order.

Exercise 4

1. Add a column curr_bal in orders table for current balance
2. Increase commission of all sales persons by 200.
3. Delete all orders where odate is less than 5-2-05

Exercise 5

1. Display names of all customers matched with the salespeople serving them.
2. Find all orders by customers not located in same cities as their Salespersons.
3. Display each order number followed by the name of customer who made it.
4. Calculate the amount of salespersons commissions on each order by a customer with a rating above 100.
5. Display the pairs of salespeople who are living in the same city. Exclude combinations of sales people with themselves as well as duplicate rows with the order reversed.
6. Display the names & cities of all customers with same rating as Hoffman.

Exercise 6

1. Write a query that uses a sub-query to obtain all orders for the customer named 'Gopal'. Assume you do not know the customer number.
2. Write a query that produces the names & ratings of all customers who have above-average orders.
3. Write a query that selects the total amt in orders for each salesperson for whom this total is greater than the amount of the largest order in table.

Exercise 7

1. Create a union of two queries that shows the names, cities & ratings of all customers. Those with a rating of 200 or greater will also have ratings "high rating", while the others will have the words "low rating".
2. Write a command that produces the name & number of each salesperson & each customer with more than one current order. Put results in alphabetical order.

Exercise 8

1. Create an index that would permit each salesperson to retrieve his or her orders grouped by date quickly.
2. Create a view that shows all of the customers who have highest ratings.
3. Create a view that shows number of salespeople in each city.

Exercise 9

1. Write a PL/SQL block of code that first inserts a record in an 'emp' table. Update the salary by Rs. 2000. then check to see that the total salary does not exceed 20000. if so, undo the updates made to the salaries.
2. HRD manager has decided to raise the salary of employees by 0.15. Write a PL/SQL block to accept the employee number & update the salary of that emp. Display message based on the existence of record in employee table.
3. When any such raise in salary, a record for the same is maintained in emp_raise table. It includes the employee no, the date of raise & the actual raise.

4. Create a stored function to perform item_id check operation. Which accepts a item_id & returns a flag as per the id exist or not.
5. Application using database triggers –
Create a transparent audit system for a table Client_master. The system must keep track of the records that are being deleted or updated. When the record is deleted or modified the original record details & date of operation are stored in audit table & then the delete & update is allowed to go.

Nature of Evaluation For Lab work :

- b) 20% marks – Based on laboratory work
- 40% marks – Programming questions and actual practical exam
- 40% marks – viva voce exam based on lab assignments