DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

Curriculum under Choice Based Credit &

Grading System

M.C.A.

Semester–I to IV

run at college level from the

Academic Year 2015-16 & onwards

REGULATIONS SPECIFIC TO

M.C.A. PROGRAMME

IN

UNIVERSITY DEPARTMENT OF

MANAGEMENT SCIENCE

Dr. Babasaheb Ambedkar Marathwada University,

Aurangabad.

2011-2012

COURSE STRUCTURE

MCA- I semester

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	MANC401	Computer Organization and Architecture	4	-	4	80	20
2.	MANC402	C programming	4	-	4	80	20
3.	MANC403	Discrete Mathematics	4	-	4	80	20
4.	MANC404	Information System Analysis and Design Methods	4	-	4	80	20
5.	MANC405	DSS and MIS	4	-	4	80	20
6.	MANC406	Basic of Web technology	4	-	4	80	20
7.	MANC451	Practical Based on MANC401	-	2	2 (Per Batch)	40	10
8.	MANC452	Practical Based on MANC402	-	2	2 (Per Batch)	40	10
9.	MANC453	Practical Based on MANC406	-	2	2 (Per Batch)	40	10
		Total Credits	30				

MCA-II semester

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	MANC407	Operating System	4	-	4	80	20
2.	MANC408	Database Management System	4	-	4	80	20
3.	MANC409	Data Structure using C	4	-	4	80	20
4.	MANC410	Software engineering	4	-	4	80	20
5.	MANC411	Probability and Combinatory	4	-	4	80	20
6.	MANC412	Visual Programming	4	-	4	80	20
7.	MANC454	Practical Based on MANC408	-	2	2 (Per Batch)	40	10
8.	MANC455	Practical Based on MANC409	-	2	2 (Per Batch)	40	10
9.	MANC456	Practical Based on MANC412	-	2	2 (Per Batch)	40	10
		Total Credits	30				

MCA-III semester

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	MANC501	Data Communication and Networks	4	-	4	80	20
2.	MANC502	OOPs using C++	4	-	4	80	20
3.	MANC503	Soft Skill	4	-	4	80	20
4.	MANC504	JAVA	4	-	4	80	20
5.	MANC52X	Elective – I	4	-	4	80	20
6.	MANC52X	Elective – II	4	-	4	80	20
7.	MANC551	Practical Based on MANC502	-	2	2 (Per Batch)	40	10
8.	MANC552	Practical Based on MANC504	-	2	2 (Per Batch)	40	10
9.	MANC55X	Practical Based on Elective – I	-	2	2 (Per Batch)	40	10
		Total Credits	30				

MCA-IV semester

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	MANC505	Design and Analysis of Algorithms	4	-	4	80	20
2.	MANC506	Object Oriented Analysis and Design	4	-	4	80	20
3.	MANC507	Research Methodology	4	-	4	80	20
4.	MANC508	Software Testing and Quality Assurance	4	-	4	80	20
5.	MANC52X	Elective – III	4	-	4	80	20
6.	MANC52X	Elective – IV	4	-	4	80	20
7.	MANC554	Practical Based on MANC508	-	2	2 (Per Batch)	40	10
8.	MANC55X	Practical Based on Elective – III	-	2	2 (Per Batch)	40	10
9.	MANC55X	Practical Based on Elective – IV	-	2	2 (Per Batch)	40	10
		Total Credits	30				

MCA-V semester

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	MANC701	Human Computer Interface	4	-	4	80	20
2.	MANC702	Advanced Internet technology	4	-	4	80	20
3.	MANC703	Advances in Algorithms	4	-	4	80	20
4.	MANC704	Software Project Management	4	-	4	80	20
5.	MANC72X	Elective – V	4	-	4	80	20
6.	MANC72X	Elective – VI	4	-	4	80	20
7.	MANC751	Practical Based on MANC702	-	2	2 (Per Batch)	40	10
8.	MANC752	Practical Based on MANC703	-	2	2 (Per Batch)	40	10
9.	MANC75X	Practical Based on Elective – V	-	2	2 (Per Batch)	40	10
		Total Credits	30				

MCA-VI semester

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1	MANC756	**Major Project**	-	**20**	4	200	300
		Total Credits	20				

Note:

1. **L** for Theory Lecture
2. **P** for Practical
3. **X** for Elective Subjects

Elective – I

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	MANC521	Advanced Database Management System	4	-	4	80	20
	MANC551	Practical Based on MANC521	-	2	2 (Per Batch)	40	10
2.	MANC522	Introduction to Linux OS	4	-	4	80	20
	MANC552	Practical Based on MANC522	-	2	2 (Per Batch)	40	10
3.	MANC523	Advanced Web technology Using ASP.net	4	-	4	80	20
	MANC553	Practical Based on MANC523	-	2	2 (Per Batch)	40	10

Elective – II

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	MANC 524	Artificial Intelligence	4	-	4	80	20
2.	MANC 525	Enterprise Resource Planning	4	-	4	80	20
3.	MANC 526	Programming Language Paradigm	4	-	4	80	20

Elective – III

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	MANC527	Advanced JAVA	4	-	4	80	20
	MANC553	Practical Based on MANC527	-	2	2 (Per Batch)	40	10
2.	MANC528	C Sharp	4	-	4	80	20
	MANC554	Practical Based on MANC528	-	2	2 (Per Batch)	40	10
3.	MANC529	Data Mining	4	-	4	80	20
	MANC555	Practical Based on MANC529	-	2	2 (Per Batch)	40	10

Elective – IV

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	MANC530	Multimedia Technology	4	-	4	80	20
	MANC556	Practical Based on MANC530	-	2	2 (Per Batch)	40	10
2.	MANC531	Advances in Linux Administration	4	-	4	80	20
	MANC557	Practical Based on MANC531	-	2	2 (Per Batch)	40	10
3.	MANC532	XML with Database	4	-	4	80	20
	MANC558	Practical Based on MANC532	-	2	2 (Per Batch)	40	10

Elective – V

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	MANC721	Artificial Neural Network	4	-	4	80	20
	MANC753	Practical Based on MANC721	-	2	2 (Per Batch)	40	10
2.	MANC722	Linux Bash Scripting	4	-	4	80	20
	MANC754	Practical Based on MANC722	-	2	2 (Per Batch)	40	10
3.	MANC723	JSP	4	-	4	80	20
	MANC755	Practical Based on MANC723	-	2	2 (Per Batch)	40	10

Elective – VI

Sr. No.	Subject Code	Subject Name	No. of Credits		No. of Hours/Week	Total Marks (External)	Total Marks (Internal)
			L	P			
1.	MANC724	Emerging Trends in Information Technology	4	-	4	80	20
2.	MANC725	Mobile Computing	4	-	4	80	20
3.	MANC726	Cyber Law	4	-	4	80	20

Sr. No.	Semester	Credit per Semester
1.	MCA-I	30
2.	MCA-II	30
3.	MCA-III	30
4.	MCA-IV	30
5.	MCA-V	30
6.	MCA-VI	20
	Total	**170**

Subject Title	Computer Organization		
Subject Ref. No.	MANC401	**No. of Credits**	4
		No. of Periods / Week	4
		Assignments / Sessionals	20
		Semester Examination	80

Course Objective

It aims at introducing basic digital concepts and then uses them to explain details of computer organization. It covers topics such as basic digital electronics, cache hierarchies, memory systems, storage and IO systems etc.

Pre Requisite

Internal Components of the CPU, Logic design and Boolean algebra

Unit – I

Introduction to Digital Computer

Functions and Block Diagram of Computer

Types of Software – System software / Application softwa+re / Utility Software. Compilers, Interpreters, Assemblers, Linker, Loader

Number System and Boolean Algebra

Binary, Octal, HEX and their inter-conversion

1's and 2's complement, Logic Gates, Binary Arithmetic, Number Systems – BCD, EBCDIC, ASCII, De-Morgan's Theorem, Duality Theorem, Algebra Rules, Logic Circuits.

Unit – II

Combinational Circuits

Karnaugh Map Techniques, Half / Full Adder – Subtractor, Multiplexer / Demultiplexer, Digital Comparator, ALU

Unit – III

Sequential Circuits

Flip Flops - SR, D, JK, Master – Slave, Shift Register, Introduction to Counter

Unit – IV

Memory System

Memory Hierarchy, Primary Memory – DRAM, SDRAM, DDR, RDRAM. ROM, PROM, EPROM, EEPROM, Concepts of Auxiliary, Associative, Cache and Virtual Memory, DMA

Unit – V

CPU Organization

CPU Building Blocks, CPU Registers and BUS Characteristics, Addressing Modes, Interrupts, Instruction sets and Execution cycle, Assembly

Programming, Pipelining – Data Path, Time Space Diagram.

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

Text Books

1. R P Jain, "Modern Digital Electronics", Tata McGraw Hill 3rd Edition

2. Mano Morris, "Computer System and Architecture", Pearson, 3rd Edition

3.Ramesh Gaonkar, "Microprocessor Architecture, Programming, and Applications", Prentice Hall 5th Edition

Additional Reference Books

1. JP Hayes, "**Computer Architecture and Organization**, McGraw Hill 2nd Ed

2.Govindarajalu, B, " IBM PC AND CLONES: Hardware, Troubleshooting and Maintenance", McGraw-Hill 2 Edition

Subject Title	C programming		
Subject Ref. No.	MANC402	**No. of Credits**	4
		No. of Periods / Week	4
		Assignments / Sessionals	20
		Semester Examination	80

Course Objective

This subject helps to clarify the programming concepts in computer languages. This subject covers all the basic techniques of programming, structure of C programming, basic statements , logical statement , graphics and file handing concepts using C programming

Pre Requisite

Basics of Computer Fundamentals and OS

Unit – I

An Overview of C

A Brief History of C, C is middle-level Language, C is a Structured Language, Complier Vs Interpreters, The Form of a C Program, Library & Linking, Compilation & Execution of C. Program on, Dos & Unix

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, Bitwise, Assignment, Conditional ,2.8 Precedence & Associativity of Operators.

Console I/O

Introduction, Character input & Output, String Input & Output, Formatted Input/Output (scanf/printf) sprintf & sscan

Unit – II

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

Command Line Arguments :

Storage Class & Scope : Meaning of Terms, Scope - Block scope & file scope, Storage Classes, Automatic Storage, Extern Storage, Static, Storage, Register Storage,

Bitwise Operator : Introduction, Applications Masking, Internal Representation of Date, Bit Fields

Unit – III	**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
Unit – IV	**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 & , * operators, Pointer to Pointer, Constant Pointer **Function :** Introduction, Arguments & local variables, Returning Function Results by reference & Call by value, Recursion **Structure, Union, Enumeration & typedef :**Structures Declaration and Initializing Structure, Accessing Structure members, Structure Assignments, Arrays of Structure, Passing Structure to function, Structure Pointer, Unions
Unit – V	**C Preprocessor :** Introduction, Preprocessor Directive Macro Substitution, File Inclusion directive, Conditional Compilation **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. **Graphics In C :** Introduction, Drawing Object in C Line, Circle, Rectangle, Ellipse, Changing Foreground & Background, Filling Object by Color
Text Books	C : The Complete Reference : Herbert Schildt , Programming in ANCI C : Balgurusamy, Graphics under C : Yashwant Kanetkar , Let us C : Yashwant Kanetkar
Additional Reference Books	Programming with C : Bryon Gottfried, Graphics Under C : Y. Kanetkar Let us C Solutions : Y.P. Kanetkar, 3. Spirit Of "C" : Moolish Kooper.

Subject Title	Discrete Mathematics		
Subject Ref. No.	MANC403	**No. of Credits**	4
		No. of Periods / Week	4
		Assignments / Sessionals	20
		Semester Examination	80

Course Objective This is first mathematics subject student will learn and revise his knowledge acquired previously. Logic, Relations and Functions, Algebraic Functions, Graph Theory and Trees will be introduced in this course.

Pre Requisite Basic knowledge of mathematics like set theory.

Unit – I **Mathematical logic:** Propositions (Statements) Logical connectivities, N, A ,V, Compound statements form, truth tables, tantology , 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.

Unit – II **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 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 , injenctive (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.

Unit – III **Algebraic Structures:** 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

Unit – IV **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 residue –arithmetic to computers group codes
Unit – V	**Graph theory & Trees:** Basic terminology , simple and weighted graph , adjacency and incidence , handshaking lemma , underlying graph of a digraph , complete graph , regular graph , bipartrite graph , complete bipartrite 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
Text Books	1. Swapan Kumar Sarkar, "A text book of Discrete Mathematics", S. Chand Publication 2. Discrete Mathematical Structures for Computer S Science by Kolman B and Bushy R , Prentice – Hall of India 1998
Additional Reference Books	3. Discrete Mathematics by C L Liu- Tata McGraw Hill Publishing house 2000 4. Discrete Mathematical Structures with applications to Computer Science by Tremblay and Manohar, Prentice – Hall of India 1997

Subject Title	Information System Analysis And Design Methodologies		
Subject Ref. No.	MANC - 404	**No. of Credits**	4
		No. of Periods / Week	4
		Assignments / Sessionals	20
		Semester Examination	80

Objective : The objective of the course is to familiarize the participants with the Information System Analysis and design, security of information.

Prerequisite : The students should have basic knowledge of Information, software.

Unit –I : **Overview of systems Analysis and design System concepts :**

1) Types of systems: Information System

2) System Development Life cycle

3) Role & Skills of system Analyst

Models:

1) Waterfall

2) Prototyping

3) Spiral (including WIN-WIN Spiral)

4) RAD

5) Group Based Approach: JAD

6) Object Oriented methodology

Unit –II: **Activities in Requirements Determination**

a) Requirements Anticipation

b) Requirements Investigation

c) Requirements Specifications

Software requirement Specification (SRS)

1] 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

2] Structure and standards followed for SRS

3] characteristics of good SRS –

Unambiguous , complete , verifiable , consistent , modifiable , traceable , usable during maintenance

Unit –III: **Evaluation :**

1) Feasibility Study : economical,operational,social,technical

2) Evaluating Proposed Solution

3) Developing a System proposal

4) Software Acquisition

Unit –IV: **Systems Design:**

Elements of Design

1) Design of input & Control, Objectives of Input Design Data Capture Guidelines ,Design of Source Document ,Input Validations

2) Design of output, Objectives of Output Design, Types Of Output

3) Design of File , Basic File Terminology , Data Structure Diagrams

Types of Files ,Methods of File Organizations

4) Design of Procedure

5) Design of program Specification

User Interface design:

Elements of good design , design issues ,features of modern GUI , Menus , Scroll bars, windows , buttons, icons ,panels , error messages etc.

Case studies should be covered on the topic

Unit –V : **Introduction to Information Security :**

Definition of Information Security ,Computer Crimes and virus, Internal Control , Need for IS ,

Types of Security –

- Physical Security
- Logical Security

Text Books :

1. Analysis & Design of Information System – V. Rajaraman
2. Software Engineering by Pressman

Reference Books :

1. Analysis & Design of Information System – James Senn
2. Software Engineering – Pressman
3. System Analysis & Design – Hawryszkiewycz
4. Software Engineering - Jawadekar
5. System Analysis & Design methods – Whiten, Bentley
6. System Analysis & Design – Elias Awad
7. Computer Security for Dummies
8. Internet Security by Derek Atkins et al.

Subject Title : MIS and DSS

Subject ref. No. : MANC405

No. of credits : 4

No. of periods per week : 4

Assignment/Sessionals : 20

Semester Exam : 80

Course Objectives : The course objective is to bring home a systemic knowledge of the MIS so that it is appreciated and understood for its wide application in business and industry.

Pre Requisite : NA

Unit-I : **MIS, Decision Making: An overview:** Concept, definition , characteristics, objectives , Role and impact of MIS, Management as a control system, MIS: A support to the management, application of MIS to e- business, organization effectiveness, Decision making concept, decision making process, organizational decision making, MIS and decision making.

Unit-II : **Information, Knowledge, Business Intelligence:** Information: A quality product, Classification of information, methods of data and information collection, value of information, IT infrastructure, components, Planning, contemporary platforms, IT Capabilities and their organizational impact – Telecommunication, Networks & internet, current trends in technologies & tools – IT enabled services, e business, wireless technologies etc.

information systems levels , information system in business , Computer based information system, limitation and disadvantages of IS, Human as an information processor, knowledge and knowledge management system, business intelligence.

Unit-III : **System Engineering: Analysis and design, BPR:** System: concept and control, types of system, general model of MIS, need of system Analysis, SDM, SSAD, OOA, OOSAD Development Life cycle, development process of MIS, Strategic design of MIS, Business process, Process model of an organization, MIS and BPR

Unit-IV : **DSS, ESS, OAS:** DSS: concept and philosophy, objectives and characteristics of DSS, major functions of DSS, Components of DSS, DSS generators and tools, limitations of DSS, GDSS, components of GDSS, MIS and benefits of DSS, ESS and components of ESS, OAS, EMS, teleconferencing, telecommuting,

Unit-V	:	automated office, off- line and online data processing **Knowledge system , artificial intelligence and ERP:** Knowledge system, types of knowledge system, Expert system, application of ES, benefits and Limitations of ES, knowledge base, inference engine, AI, neural network in business, SIS, EMS, ERP, ERP models and modules, benefits of ERP, ERP implementation, SCM, CRM.
Text Books	:	1. Decision Support & Expert System, Efraim Turban 2. W.S.Jawadekar, Management Information System 3. Dr. A.K.Gupta, Management Information System, S.Chand 4. C.S.V. Murthy, Management Information System, Himalaya publishing house, millennium edition
Additional Reference Books	:	1. Spargue, Ralph H. *Decision Support for Management*, Englewood Cliffs, New Jersey, Prentice Hall Inc., 1995. 2. Turban, E. *Decision Support & Expert Systems*, 2nd ed., New York, MacMillan, 1990. 3. Ken Laudon, jane Laudon, Rajanish Dass, Management Information System, Pearson, Eleventh edition

Subject Title	**Basics of Web Technology**		
Subject Ref. No.	MANC406	**No. of Credits**	4
		No. of Periods / Week	4
		Assignments / Sessionals	20
		Semester Examination	80

Course Objective
This course assumes that students are aware of basic programming structure. In this course student will learn web programming languages such as HTML, JavaScript, XML, and ASP.

At Course Completion
After complication of this course students can write good application based on basic web technology using HTML, JavaScript, XML, ASP. Students can develop their own web sites.

Prerequisites

Student should know the basic programming concepts.

Unit I : **HTML & Forms**
Introduction To HTML, WWW, W3C, web publishing, Common HTML, Tags Physical & Logical, Some basic tags like <body> , changing background color of page, text color etc., Text formatting tags, <p>
, <hr> tags, Ordered & Unordered Lists Tags, Inserting image, Links: text, image links, image mapping , Tables , Frames, Form Introduction with text box, text area, buttons, List box, radio, checkbox etc.

Unit II : **CSS**
Introduction To Style sheet, types of style sheets- Inline, External, Embedded CSS, text formatting properties, CSS Border, margin properties, Positioning Use of classes in CSS, color properties, use of &

Unit III : **JavaScript**
Intro to script, types, intro of JavaScript, JavaScript identifiers, operators, control & Looping structure, Intro of Array, Array with methods, Math, String, Date Objects with methods User defined & Predefined functions, DOM objects, Window Navigator, History, Location, Event handling, Validations On Forms

Unit IV : **VBScript**
Intro. To VBSCript, Variables, Data types, Control Structures & Loops, Functions in VBSCript, Client side web scripting, Validating forms, DOM, Handling errors

Unit V : **XML**

Intro & features of XML, XML writing elements, attributes etc. XML with CSS, DSO, XML Namespaces XML DTD, XML Schemas, Writing Simple sheets usingXSLT, SAX & DOM Parsers,SOAP Intro.

Reference books

1. Complete reference HTML.
2. JavaScript Bible
3. HTML, DHTML, JavaScript, Perl & CGI Ivan Bayross
4. VBScript Programmers reference wrox Press
5. Beginning XML Wrox Press

MNAC453 Practical based on MANC406

Student is required to complete website project using any of above technologies.

Subject Title	Computer Organization Lab		
Subject Ref. No.	MANC451	**No. of Credits**	2
		No. of Periods / Week	2
		Internal	10
		External	40
Course Objective	This lab course is a foundation for computer hardware design. It imparts basic theory and practice required to master the art of Designing Digital Systems, Assembly Programming which are part any automation we see today		
Course Description & Pre Requisite	Students have to perform at least 15 assignments out of 17 which are listed below.		
	Computer Organization Theory		
Software to be used	Xilinx for Digital Design, Microprocessor Simulator, Turbo C compiler.		
Assignment No 1	Write a program to make any conversion in number system.		
Assignment No 2	Write a program to calculate binary addition and subtraction using 2'complement.		
Assignment No 3	Check all basic logic gates using Xilinx.		
Assignment No 4	Design a Full adder and Full subtractor circuits using Xilinx.		
Assignment No 5	Design 16: 1 Multiplexer with NAND gate using Xilinx.		
Assignment No 6	Design 32 : 1 Multiplexer using 8:1 Multiplexer tree in Xilinx.		
Assignment No 7	Design 6 : 64 De-multiplexer using 4 : 16 De-multiplexer in Xilinx.		
Assignment No 8	Design Shift Register		
Assignment No 9	Design Basic Counter		
Assignment No 10	Write a program for Addition and Subtraction of two 16 - bit numbers using 8086.		
Assignment No 11	Write a program for Multiplication of two 16 - bit numbers using 8086.		
Assignment No 12	Write a program to find the sum of a series of 8-bit numbers in a given array of 10 numbers.		

Assignment No 13	Write an Assembly language program to find largest numbers.
Assignment No 14	Write an Assembly language program to perform the Logical AND & OR operation.
Assignment No 15	Write an assembly language program to arrange the given numbers in ascending order.
Assignment No 16	Write an assembly language program to arrange the given numbers in descending order.
Assignment No 17	Write an assembly language program to move the block of data from a source location to the specified destination location.

Subject Title	C Programming Lab		
Subject Ref. No.	MANC452	**No. of Credits**	2
		No. of Periods / Week	2
		Internal	10
		External	40

Course Objective C programming Lab is design to study the working of programming , role of compiler , execution of programs written by the user , data flow organization throughout the program . This lab course is a fundamental interaction between user's programs and complier's function.

Course Description & Pre Requisite Students have to perform at least 25 assignments out of 30 which are listed below.

C programming knowledge

Software to be used Turbo C editor and compiler.

Assignment No 1 Write a program to find Area, Perimeter of Square & Rectangle.

Assignment No 2 Write a program to enter any year and check whether it is leap year or not

Assignment No 3 Write a Program on string and numbers

Assignment No 4 Write a Program to find greater among five using conditional operator

Assignment No 5 Write a Program to find odd and even numbers between 1 to 100 using go to statement.

Assignment No 6 Write a program to find max. Among 3 nos.

Assignment No 7 Write a program to enter any numbers and find the factorial of that number

Write a program to enter any number and find it is prime number or not

Assignment No 8 Write a program, to enter any number and find it is an Armstrong Number or not

Assignment No 9 Write a program to print Floyd's Triangle

Write a program to print Fibonacci Series with lower and upper limit

Assignment No 10	Write a program to make inter conversion of Decimal, Binary & Hexadecimal no.
Assignment No 11	Write a program to find LCM & GCD of numbers
Assignment No 12	Write a program to Insert & Delete an element at given location in array.
	Write a program to Transpose of matrices
Assignment No 13	Write a program to find the Multiplication of matrices
	Write a program to Display upper & lower diagonal of matrices
Assignment No 14	Array of Structure e.g. student result, Employee pay slip , Phone b
	Write a program to perform all arithmetic operations on two numbers using pointer
Assignment No 15	Programs on following concepts
	Function with no parameter & no return values
	Function with parameter & return values
Assignment No 16	Function with parameter & no return values
	Function with call by reference
Assignment No 17	Recursion function e.g. sum of digit, reverse of digit, Fibonacci series , factorial on given number
Assignment No 18	String manipulation function e.g. string copy, concatenation, compare, stringlength, reverse string
Assignment No 19	Five Programs on Loop within loop and on specific output
Assignment No 20	Five program on loop within loop and on specific output
Assignment No 21	File handling e.g. Read / Write file, copy file, merging file and Random access of file
	Write a program to store number of sentences in backend file
Assignment No 22	Write a program to enter 40 numbers and separate odd and even numbers from them and display the contents of odd and even file
Assignment No 23	Write a program to store the record in data.dbf file with following details

	Empcode, name, designation, basic salary , net salary using binary file
Assignment No 24	Using command line argument
	Program to copy content of one file to another
Assignment No 25	Sort numbers from file
	Read & write data using fprintf() and sscanf() function
Assignment No 26	Write a program s to Drawing line, rectangle, circle, ellipse by using graph
	Changing foreground/ background color and Changing color & font of text
Assignment No 27	Program on circle , rectangle , ellipse using loop within loop
Assignment No 28	Program on Swapping of numbers by using bit wise operator.
	Program to find the complements of any number using
Assignment No 29	Program on Macro expansion
	Program on File Inclusion
Assignment No 30	Write a program to create macros for finding greater among three number, concate two strings.

Subject Title	Practical Based on MANC406		
Subject Ref. No.	MANC453	**No. of Credits**	2
		No. of Periods / Week	2
		Internal	10
		External	40

Student is required to complete website project using any of above technologies.

Subject Title	:	Operating System Concepts			
Subject Ref. No.	:	MANC407	**No. of Credits**	:	4
			No. of Periods / Week	:	4
			Assignments Sessionals	:	20
			Semester Examination	:	80

Course Objective : The objectives of this course are to understand fundamental concepts of operating system, to understand recognizing operating systems features and issues. .And sufficient understanding of operating system design and how it impacts application systems design and performance

Pre Requisite : Fundamentals of Computer System

Fundamentals of C programming

Unit – I : **Introduction**: Logical View, User View System Calls, Concept of Virtual Machine, Interrupt Concept

Unit – II : **Process Management:** Process Concept, Process Control Block, Process Schedule , Process operations, Inter-process Communication, Communication in Client-Server

CPU Scheduling: Scheduling Concept, Scheduling Criteria, Scheduling algorithms, Scheduling Evaluation, Simulation Concept

Unit – III : **Process Synchronization & Deadlock:** Synchronization concept, Synchronization Requirement, Critical Section Problem, Monitors, Deadlock concepts, Deadlock prevention & avoidance, Deadlock Detection, Deadlock Recovery

Unit – IV : **Memory Management:** 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.
File management: File Structure, Protection, FILE system Implementation, Directory structure, Free Space Management, Allocation Methods, Efficiency & Performance, and Recovery.

Unit – V : **Disk Management:** Disk Structure, Disk Scheduling algorithm, Disk management, Swap Space concept and Management, Disk performance issues
Distributed Operating System: Difference Between Distributed & Centralized OS ,Advantages of Distributed OS, Types of Distributed

OS, Concept of Global OS, NOS Architecture.

Text Books : 1. Silberschatz , Galvin, and Gagne "Operating System Concepts", John Wiley, 8th Ed., 2009.
2. D. M. Dhamdhere Operating Systems--A Concept Based Apparoach, McGraw-Hill, 2008

Additional Reference Books : 1. Tannenbaum, "Operating Systems", PHI, 4th Ed., 2000.

2. William Stallings, "Operating Systems Internals & Design Principles", Pearson Education, 6th Ed., 2009.

Subject Title	:	Database Management System			
Subject Ref. No.	:	MANC408	**No. of Credits**	:	4
			No. of Periods / Week	:	4
			Assignments Sessionals	:	20
			Semester Examination	:	80

Course Objective : The course introduces the basic concepts of database systems and also gives the in depth knowledge of various principles of DBMS.

Pre Requisite : NA

Unit – I : **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
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

Unit – II : **Relational Model and Relational Database design**
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, Specifyingconstraints management systems, Oracle , Ingres
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

Unit – III : **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

Unit – IV : **Transaction And Concurrency control :** Concept of transaction, ACID properties , Serializibility, States of transaction, Concurrency control, Locking techniques , Time stamp based protocols, Granularity of data items, Deadlock

Unit – V : **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

Security and privacy : Database security issues, Discretionary access control based on grant & revoking privilege, Mandatory access control and role based access control for multilevel security, Encryption & public key infrastructures

Text Books :

1. Database system concept Korth
2. Fundamentals of Database Sysems Elmasri Navathe
3. Database Management Systems Bipin Desai

Additional Reference Books :

1. Introduction to database systems C.J.Date
2. Principles of Database Management James Martin
3. Computer Database organization James Martin
4. Database system practical Approach to design, implementation & management Connoly & Begg
5. Database Management systems Ramakrishnan & Gehrke

Subject Title	Data Structure using C		
Subject Ref. No.	MANC409	**No. of Credits**	4
		No. of Periods / Week	4
		Assignments / Sessionals	20
		Semester Examination	80

Course Objective This subject helps to clarify the concepts of data structure which help to enhance programming techniques in procedure oriented and object oriented languages. This subject covers all the techniques of stack, queue , tree and graph theory and its implementation in normal programming languages i.e. in c or c++

Pre Requisite C programming knowledge

Unit – I

Introduction To Data Structure : Introduction, Data Definition, Data Object, Data Types, Built-in Data Type, Derived Data Type, Data Structure, Implementation of Data Structure

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

Unit – II

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 array and Linked list, Generalized Linked List, Header Linked List

Unit – III

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

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

Unit – IV	**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
	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
Unit – V	**Graph :** Introduction, Graph Representation, Adjacency Matrix, Adjacency List, Graph Traversals, Depth First Search, Breadth First Search, Applications of Graph
Text Books	C & Data Structure Balagurusamy, Data Structure through C in depth Shrivastava & Shrivastava , Data Structure through C Y.P. Kanetkar
Additional Reference Books	Data Structure Seymour Liptsuz, Data Structure Tannebaum , Data structure and program design in c R.L.Kruse

Subject Title : Software Engineering

Subject Ref. No.	MANC - 410	No. of Credits	:	04
		No. of Periods/Week	:	04
		Assignments/Sessional	:	20%
		Semester Exam.	:	80%

Course Objective

The purpose of this course is to understand the Software Engineering process, DFD, ERD, Software Inspection process, different design methods, maintenance, CASE TOOLS.

Prerequisite :

Emergence of Software Engineering, Different software life cycle models.

Unit –I :

1A) Current trends in Software Engineering

1.1 Software Engineering for projects & products.
1.2 Introduction to Web Engineering and Agile process

1B) Information requirement Analysis:

1) Decision Analysis Tools: Decision Tree, Decision Table, Structured English
2) Functional Decomposition Diagram
3) Process modeling with physical and logical Data Flow Diagrams
4) Entity Relationship Diagram : Identify Entity &Relationships
4) Data Dictionary
Case Studies on Decision analysis tools
FDDs, DFDs should be covered

Unit –II :

Software Inspection

Inspection team, members, process, steps, documents, checklist, defect recording and recommendation format, evaluation of inspection process, benefits.

Unit –III:

Design Methods:
3.1 Data design
3.2 Architectural Design
3.3 Procedural Design
3.4 Interface Design
3.5 Code design

Unit – IV:

Maintenance
4.1 Types of Maintenance
4.2 Maintenance Cost
4.3 Reverse Engineering
4.4 Introduction to legacy systems
Documentation
4.5 Types
4.6 Role of documentation inmaintenance

Unit – V :

CASE TOOLS

CASE tools , types – project management,analysis , designing , programming ,prototyping , maintenance , advantages of using CASE tools , I-CASE , future of CASE

Text Books:

1. Software Engineering by Pressman
2. DBMS Concepts – Korth

Reference Books :

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

Subject Title	Probability and Combinatorics		
Subject Ref. No.	MANC411	**No. of Credits**	4
		No. of Periods / Week	4
		Assignments / Sessionals	20
		Semester Examination	80

Course Objective The second mathematics subject in which the student will learn and revise knowledge acquired previously about probabilities and combinations. Permutations and Combinations, principle of inclusion and exclusion, probability, expectation and moment generating function will be introduced.

Pre Requisite Basic knowledge of probability, permutations and combinations and binomial theorem.

Unit – I **Permutations & Combinations:** Addition principle, multiplication principle, Bijection principle, r-permutations of nelements, r-combination of nelements, binomial coefficients, circular permutations, permutations with repetitions, Multinomial theorem, combinations with repetitions, Distribution of objects-Distinct objects in distinct cells, Indistinguishable objects in distinct cells, Distinct objects in, indistinguishable cells, Indistinguishable objects in distinguishable cells.

Unit – II **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. 6 Special properties of the distribution (if any)should be tested.

Unit – III **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.

Unit – IV **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

Unit – V **Generating Functions and Recurrence Relations:** Principle of Inclusion & Exclusion,Formula Derangement- restrictions on relative positions Generating functions for discrete numeric functions, for combinations, Homogeneous, non-homogeneous,Pigeonhole principle

Text Books

1. S.C. Gupta and V K Kapoor, "Mathematical Statistics", Publication Sultan chand and sons 2002
2. Swapan Kumar Sarkar, "A text book of Discrete Mathematics", S. Chand Publication 2003

Additional Reference Books

1. Discrete Mathematics by C L Liu Tata McGraw Hill Publishing house 2000
2. S P Gupta, "Statistical Methods", Publications sultan chand and sons 2008
3. Elhance D.N. , Elhance Veena , Agrawal B.M. Fundamentals of Statistics , Publication Kitab Mahal 2002

Subject Title	Visual Programming		
Subject Ref. No.	MANC412	**No. of Credits**	4
		No. of Periods / Week	4
		Assignments / Sessionals	20
		Semester Examination	80

Course Objective

This course assumes that students are aware of C programming and hence they are exposed to sophisticated application framework. In this course student will learn visual basic programming languages and Database management using VB.

At Course Completion

After complication of this course students can create good applications based on visual basic and access. Students can develop their own projects.

Prerequisites

Student should know the programming in C with object oriented programming concepts.

Course Outline

Unit 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

Unit 2: Variables

Data Types, Types of variables Forcing variable declarations lifetime & scope, Converting variable types User defined data types, Constants, Arrays Declaring arrays, Multidimensional arrays, Input box() & 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

Unit 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 List Box , Searching a sorted list, Scroll bars & slider controls, Timer Dir, File, Drive list boxes, The remaining controls like shape, image, picture etc.

Unit 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, 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.

Unit 5: Database programming & Error Handling

Understanding Databases & Database Management Systems Record sets, Accessing fields in Database Data Control – Properties, Methods, and 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

Reference books

1. Visual Basic 6.0 Black Book
2. Mastering Visual Basic 6.0

Subject Title	:	Database Management System
Subject ref. No.	:	MANC454
		No. of credits : 2
		No. of periods per week : 2
		Internal : 10
		External : 40
Course Objectives	:	The objective of the course is to make student equipped with the latest DBMS software.
Pre Requisite	:	Knowledge of MS-Access will be preferred.
Software Used	:	Oracle 9i/Oracle 10g/ Oracle 11g
Assignment I	:	1 Overview of RDBMS, Oracle introduction
		2 Introduction of SQL DDL, DML, DTL Basic Data Types Char, varchar/varchar2, long, number, Fixed & floating point Date, CLOB, BLOB
		3 Table Constraint definition Commands to create table
Assignment II	:	1 Commands for table handling Alter table, Drop table, Insert records
		2 Commands for record handling Update, Delete Select with operators like arithmetic, comparison, logical Query Expression operators Ordering the records with orderby Grouping the records
		3 SQL functions : Date, Numeric, Character, conversion Group functions avg, max, min, sum, count
Assignment III	:	7 Set operations Union, Union all, intersect, minus
		8 Join concept Simple, equi, non equi, self, outer join
		9 Query & sub queries
Assignment IV	:	10 Synonym introduction, object type Create, synonym as alias for table & view, drop
		11 Sequence : Introduction, alter sequence, drop
		12 View : Intro, create, update, drop
Assignment V	:	13 Index : Introduction, create
		14 Primary introduction to DBA User create, granting privileges (Grant, Revoke, Commit, Rollback, Savepoint)
		15 Report writer using SQL Title, Btitle, skip, pause, column, SQL, Break on, computer sum
Assignment VI	:	16 Introduction of PL/SQL Advantages of PL/SQL Support of SQL Executing PL/SQL

		17	PL/SQL character set & Data Types Character, row, rowed, Boolean, binary integer, number Variable, constant
Assignment VII	:	18	PL/SQL blocks Attribute % type, %rowtype, operators, function comparison numeric, character, date Control structure Condition – if Interactive- loop, for, while Sequential – goto
		19	Composite data types Record- declaration, refer, record assignment Table- Declaration, table attributes (Count, delete, exists, first, last, next, prior)
Assignment VIII	:	20	Database Triggers Definition, syntax, parts of triggers Types of triggers, enabling & disabling triggers
Assignment IX	:	21	Sub programs : Definition Features Cursors
Assignment X	:	22	Procedures : Definition, creating, Parameter
		23	Function Definition & implementation
Assignment XI	:		Exercise1 1. Create table Salespeople with fields snum, sname, city, commission 2. Orders table with fields onum, odate, snum, amt 3. Customers table with fields cnum, cname, city, rating, snum
Assignment XII	:		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
Assignment XIII	:		Exercise 3 (cont.) 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 customers 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.

Assignment XIV : 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 customers 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 customers highest ratings in each city.
16. Write a query that totals the orders for each day & places the results in
descending order.

Assignment XV : 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

Assignment XVI : 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.

Assignment XVII : 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.

Assignment XVIII : Exercise 7

1. Create a union of two queries that shows the names, cities 7 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.

Assignment XIX	:	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.
Assignment XX	:	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.
Text Books	:	1. SQL, PL/SQL the programming language of Oracle Ivan Bayross
Additional Reference Books	:	1. Understanding ORACLE Perry J. & Later J. 2. Understanding SQL Martin Gruber, BPB publication 3. SQL Scott Urman 4. ORACLE PL/SQL Programming Scott Urman

Subject Title	Data Structure using C		
Subject Ref. No.	MANC455	**No. of Credits**	2
		No. of Periods / Week	2
		Internal	10
		External	40

Course Objective

Data structure is very powerful tools which help to build all type of data and manipulate it for procedure oriented and object oriented programming languages Lab is design to study the functions of linear and non-linear data and it implementation of system programming. This lab course enhance the logical thinking of the user.

Course Description & Pre Requisite

Students have to perform at least 30 assignments out of 25 which are listed below.

C programming knowledge

Software to be used

Turbo C editor and compiler.

Assignment No 1

Write a program to find factorial of given number using tail recursion .

Assignment No 2

Write a program of Tower Hanoi to move N disk from one pillar to another

Assignment No 3

Write a Program to perform all arithmetic operations on 2 numbers using pointer to pointer

Assignment No 4

Write a Program to accept 10 numbers and sort them using pointer

Assignment No 5

Write a program to enter 10 names and sort it using array of pointer to string

Assignment No 6

Write a menu driven perform sizeof, malloc, calloc, realloc and free dynamic memory allocations.

Assignment No 7

Write a program for Addition and Multiplication of Two Polynomials. Using array

Assignment No 8	Write a program for Addition and Multiplication of Two Polynomials. Using Linked List
Assignment No 9	Write a program to present Sparse Matrices in 3-tuple method using array
Assignment No 10	Write a menu driven program to push, pop, display the element is stack using array
Assignment No 11	Write a menu driven program to push, pop, display the element is stack using Linked list
Assignment No 12	Write a menu to enter any string and display it in reverse order using stack
Assignment No 13	Write a program to enter any expression and find it whether valid or invalid
Assignment No 14	Write a menu driven program to create, insert(beginning ,between and end) , display delete element in linked list
Assignment No 15	Write a menu driven program to create reverse linked list , circular linked list , sorted linked list
Assignment No 16	Write a program to create double linked list , insert ,display and delete elements also
Assignment No 17	Write a menu driven program to create , display, delete element from queue
Assignment No 18	Write a program to create a priority queue and circular queue and display the contents of both
Assignment No 19	Write a program insert, delete and traverse binary search tree
Assignment No 20	Write a program to find inorder and preorder traversal in in-threaded tree
Assignment No 21	Write a program for addition and deletion of nodes and edged of graph using adjacency of matrix
Assignment No 22	Write a program for addition and deletion of nodes and edged of graph using adjacency of matrix
Assignment No 23	Write a program for traversing BFS in graph
Assignment No 24	Write a program for traversing DFS in graph
Assignment No 25	Simulation of scheduling algorithms: Write a program to implement the following process scheduling algorithms.
*	First Come First Serve

Shortest Remaining Job First
. Round Robin
. Preemptive Priority Scheduling

Assignment No 26 Implementation of semaphore: Write a program that demonstrates how two processes can share a variable using semaphore.

Assignment No 27 Write a program to implement producer consumer problem (Using POSIX semaphores)

Assignment No 28 Write a program to implement Banker's algorithm for a multiple resources.

Assignment No 29 Write a program to implement:

First Come First Serve Disk scheduling algorithm.
Shortest Seek Time First Disk scheduling algorithm.
. Scan Disk Scheduling algorithm.
. Look Disk Scheduling algorithm.

Assignment No 30 Write a program to study page replacement policies:

OPTIMAL
LEAST RECENTLY USED(LRU)
. FIRST-IN-FIRST-OUT

Subject Title	Practical Based on MANC412		
Subject Ref. No.	MANC456	**No. of Credits**	2
		No. of Periods / Week	2
		Internal	10
		External	40

Student is required to complete at least minimum two practical on each unit, Student is required to complete mini project using visual basic with database connectivity.

MCA – III SEM

Subject Title :		Data Communication and Networks		
Subject Ref. No.	MANC501	No. of Credits	:	04
		No. of Periods/Week	:	04
		Assignments/Sessional	:	20
		Semester Exam.	:	80

Course Objective Various types of computer networks, technologies behind networks and Application protocols, e-mail and communication protocols will be introduced to students through this subject.

Prerequisite : Basic information regarding networking.

Unit –I :
Introduction to Networking:
Hardware Architecture:- Topologies, Media, Devices
Transmission Techniques:-Twisted Pair, Coaxial Cable, Fiber Optics,
Wireless Transmission Switching: - Circuit Switching, Message Switching, Packet Switching

Unit –II :
Common Network Architecture:
Connection oriented N/Ws, Connectionless N/Ws
Local Area Networks:
Components & Technology , Access Technique
Transmission Protocol & Media

Unit –III :
The OSI Reference Model:
Protocol Layering, TCP/IP Model,
OSI vs TCP/IP

Unit – IV :
Broad Band Networks
Integrated Service Digital Networks (ISDN), Broad Band ISDN, ATM, ATM Traffic Management, Introduction to very small Aperture, Terminal(VSAT)

Unit – V :
Network Applications (HTTP, Email, etc)
Hyper Text Transfer Protocol (HTTP)
HTTP communications: - HTTP request, Request Headers, Responses, Status Code, Error Status Code
Email : Sending & Receiving Emails, Email Addressing, Message Structure
MIME – Multipurpose Internet Mail Extensions
SMTP – Simple Mail Transfer Protocol with Examples
Mail Exchangers – Delivering a message, Mail Boxes
POP – Post Office Protocol
IMAP – Internet Message Access Protocol
FTP – File Transfer Protocol
Telnet – Remote Communication Protocol
Proxy Server, Proxy Web Servers

Text Books :
1. Computer Networks , Abndrew S. Tanenbaum 4e

Reference Books :
1. Internetworking Technology Handbook , CISCO System
2. Introduction to Networking and Data Communications, Eugene Blanchard
3. Computer Networks and Internets with Internet Applications, Douglas E. Comer
4. Firewalls and Internet Security, William R. Cheswick

Subject Title	:	Object Oriented Programming with C++		
Subject Ref. No.	:	MANC502	**No. of Credits**	: 4
			No. of Periods / Week	: 4
			Assignments / Sessionals	: 20
			Semester Examination	: 80
Course Objective	:	The objective of the course I to make student equipped with the object oriented concepts of programming so that the student finds it easy to deal with the other OOPL like Java etc.		
Pre Requisite	:	C		
Unit – I	:	**Principle of OOP's:** Introduction Procedural Vs Object Oriented Programming Classes, Object, Data Abstraction, Encapsulation, Inheritance, Polymorphism Dynamic Binding, Message Passing Object Oriented Languages Object Based languages **Basics of C++:** A Brief History of C & C++ C Vs C++ A Simple C++ Program		
Unit – II	:	**Expression:** Tokens, Keywords, Identifiers & Constants, Basic Data Types, User-Defined Data Types, Symbolic Constant, Type Compatibility, Reference Variables, Operator in C++, Scope Resolution Operator, Member De-referencing Operators, Memory Management Operators, Manipulators, Type Cast Operator **Functions In C++:** The Main Function, Function Prototyping Call by Reference, Call by Value, Inline Function, Function Overloading, Friend Function		
Unit – III	:	**Classes & Object:** A Sample C++ Program with class Defining Member Functions Making an Outside Function Inline Nesting of Member Functions Private Member Functions Arrays within a Class Memory Allocation for Objects Static Data Members, Static Member Functions, Arrays of Objects Object as Function Arguments Friendly Functions, Returning Objects, Const member functions Pointer to Members, Local Classes		
Unit – IV	:	**Constructor & Destructor:** Constructor, Parameterized Constructor, Multiple Constructor in a Class Constructors with Default Arguments, Dynamic Initialization of Objects ,Copy Constructor **Operator Overloading & Type Conversion:** Defining operator Overloading ,Overloading Unary Operator, Overloading Binary Operator , Type Conversion , Rules for Overloading Operators		
Unit – V	:	**Inheritance:** Defining Derived Classes ,Single Inheritance, Making a Private Member Inheritable, Multilevel Inheritance, Hierarchical Inheritance ,Multiple Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructor in Derived Classes, Nesting of Classes **Virtual Function;** Virtual Function, Pure Virtual Function, Early Vs Late Binding, concept of pointers, Pointer to Object, This pointer Introduction to exception handling and working with files.		
Text Books	:	1. C++: The Complete Reference Herbert Schildt 2.Let us C++ Kanetkar 3.Object Oriented Programming with C++ E. Balagurusamy		
Additional Ref. books	:	1. C++ Programming Language Bjarne Stroustrup		

Subject Title	: Practical Based on MANC502			
Subject Ref. No.	: MANC551	**No. of Credits**	:	2
		No. of Periods / Week	:	2
		Assignments / Sessionals	:	10
		Semester Examination	:	40

Course Objective : The objective of the course I to make student equipped with the object oriented concepts of programming so that the student finds it easy to deal with the other OOPL like Java etc.

Pre Requisite : C programming
The practical assignments would be as per the theory taught in the class.

Text Books :
1. C++: The Complete Reference Herbert Schildt
2.Let us C++ Kanetkar
3.Object Oriented Programming with C++ E. Balagurusamy

Additional Reference Books :
1. C++ Programming Language Bjarne Stroustrup

Subject Title :		Soft Skill		
Subject Ref. No.	MANC503	No. of Credits	:	04
		No. of Periods/Week	:	04
		Assignments/Sessional	:	20
		Semester Exam.	:	80

Course Objective

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.

Prerequisite :

Unit –I : **Self-Development and Assessment**

1.1 Self-Assessment
1.2 Self-Awareness,
1.3 Perception and Attitudes
1.4 Values and Belief System
1.5 Personal Goal Setting
1.6 Career Planning,
1.7 Self-Esteem,
1.8 Building of Self-Confidence

Unit –II : **Components of communication, Principles of communication barriers , listening skills, Verbal Communication**

2.1 Includes Planning
2.2 Preparation
2.3 Delivery, Feedback and Assessment of activities like
a. Public speaking
b. Group Discussion
c. Oral Presentation skills, Perfect Interview
d. Listening and observation skills, Body language
2.4 Use of Presentation graphics,
2.5 Use of Presentation aids, Study of communication.

Unit –III : **Written Communication**

3.1 Technical Writing–Technical Reports
3.2 Project Proposals,
3.3 Brochures,
3.4 Newsletters,
3.5 Technical Articles
3.6 Technical Manuals
3.7 Official/Business Correspondence
a. Business letters
b. Memos
c. Progress report, Minutes of meeting, Event reporting, Use of style, Grammar

and Vocabulary for effective technical writing,
d. Use of : Tools, Guidelines for technical writing, Publishing

Unit – IV : **Ethics and Etiquettes**

4.1 Business Ethics
4.2 Etiquettes in social as well as Office settings
4.3 Email etiquettes
4.4 Telephone Etiquettes
4.5 Engineering ethics and ethics as an IT professional, Civic Sense.

Unit – V : **Other Skills**

5.1 Managing time
5.2 Meditation
5.3 Understanding roles of Engineer and their Responsibility
5.4 Exposure to work environment And culture in today's job Places
5.5 Improving Personal Memory, Study skills that include Rapid reading, Notes taking, Complex problem solving, creativity.

Reference Books : **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

Subject Title	:	JAVA			
Subject Ref. No.	:	MANC504	**No. of Credits**	:	4
			No. of Periods / Week	:	4
			Assignments Sessionals	:	20
			Semester Examination	:	80

Course Objective : This subject helps to clarify the programming concepts in JAVA language. This language covers all the techniques of developing the JAVA programs. The course structure of JAVA programming Languages is help to develop web based applications and APPs for Android Mobiles

Pre Requisite : Fundamentals of Computer System , operating system , C and C++ Language

Unit – I : Java Fundamentals , Features of Java , OOPs concepts benefits of JAVA, JAVA and Internet, JAVA and WWW, Hardware / Software requirement, Support system and Environment of JAVA, Application of More JAVA, application with two classes , program structure , tokens, statements installing and configuration JAVA , implementing JAVA program, JAVA virtual M/C , command line arguments, program style, data types, Operators, Decision Making and Branching , Decision Making and looping

Unit – II : Class objects and methods: class definition , methods, fields declaration , object and operations on it , constructor , overloading , static members , nesting methods , Inheritance, overloading , Final class and Methods , array string and vector, Interfaces : definition , implementation , accessing Interface Variables , **Packages** : introduction, uses , creating , accessing adding a class to package hiding class

Unit – III : Multithreaded Programming : Introduction , creating threads stopping and blocking a threads , Life cycle of a thread, its exceptions priority, synchronization, Managing Errors and Exception : types of error , exception , syntax of exception Handling , multiple catch statement, throwing our own exception Applet Programming : Introduction , preparing to write Applets building Applets code, creating an executable Applet , designing a web page , applet tag, adding Applet Tag, running applet more HTML tags , event handling

Unit – IV : AWT programming : introduction , create JAVA application using AWT, creating JAVA Applet using AWT , execute applet, execute applet in browse, message in the status bar, get HTML and AREA size , window and event, Graphic Programming : introduction, Graphic class, lines and rectangles, circle, ellipse, arcs poly, line graphs, using control loops in Applets , Bar charts , Text Field, Label , button , check box layouts , text area, scroll list , selection control, scrollbar, menu, dialog.

Subject Title	: Practical Based on MANC504			
Subject Ref. No.	: MANC552	**No. of Credits**	:	2
		No. of Periods / Week	:	2
		Internal	:	10
		External	:	40

Course Objective	:	JAVA programming Lab is design to this course to known how JAVA programming can write , compile and execute the programs. Writing and testing applets for potential inclusion in web pages. Understanding how applets can works Understanding the Java features for secure communications over the internet.
Course Description & Pre Requisite	:	Students have to perform the assignments which are listed below. C and C++ concepts
Software to be used	:	JDK
Assignment No 1	:	Simple 10 programs on basic functions of JAVA
Assignment No 2	:	Five Programs on array , Strings and Vectors
Assignment No 3	:	Five programs on class in JAVA
Assignment No 4	:	Five programs on Interfaces and packages
Assignment No 5	:	Five programs on Multithreading
Assignment No 6	:	Five Programs on Applet in JAVA
Assignment No 7	:	Five Programs on Input/output files in JAVA
Assignment No 8	:	Five programs on Graphics in JAVA
Assignment No 9	:	Five programs on AWT concepts (Image , text field, label, buttons, check button, radio button)
Assignment No 10	:	Five programs on AWT concepts (layout, grid, scroll list, and menu)

Unit – V	:	Managing Input / Output Files in JAVA : streams, streams classes, Byte streams classes , reading and writing characters , bytes, Random Access Files , Interactive I/p and o/p,
Text Books	:	Programming with Java A Primer, E.Balaguruswamy Tata McGraw Hill Companies, Core Java, Dietel and Dietel
Additional Reference Books	:	The complete reference JAVA2, Herbert schildt. TMH, Java Programming John P. Flynt Thomson 2nd, Java Programming Language Ken Arnold Pearson , Big Java, Cay Horstmann 2nd edition, Wiley India Edition