



MANONMANIAM SUNDARANAR UNIVERSITY

Accredited With B++ Grade by NAAC
Tirunelveli, Tamilnadu, India. Pin - 627012.

அறிவே அனைத்து ஆற்றலும்
KNOWLEDGE IS POWER



INTEGRATED MASTER OF COMPUTER APPLICATIONS [MULTI ENTRY AND MULTI EXIT SCHEME]

1. Course Objective:

- To demonstrate the ability to communicate effectively, both oral and written capacities as evidence by the proper use of grammar, phraseology and organizational skills.
- To demonstrate the ability to discuss aspects of culture and worth of society, recognize the contribution of science and use of appropriate mathematical thinking to judge the relevance of results when applying technology to solve problems.
- To demonstrate the ability to apply critical thinking and use of deductive reasoning in solving problem while completing the program, recognizing that a skill learned in one course can be applied to all other courses.
- To demonstrate a command in the effective use and application of Information technology that is now common place at home and workplaces.

2. Admission

Candidate can apply for either (1) Academic Year Admission or (2) Calendar Year Admission

- Academic Year Admission – Candidates are admitted during June to December
- Calendar Year Admission – Candidates are admitted during January to May

3. Eligibility for admission

a. A candidate who has passed 10 + 2 with Mathematics (if there is no Mathematics in +2, then Mathematics Bridge Course must be passed along with 1st Year) or equivalent

b. Multi Entry Policy:

- A candidate who has passed 10+2 and DCA or 'O' level from DOEACC or Polytechnic Diploma or equivalent is eligible for lateral entry into 2nd year.
- A Candidate who has passed 10+2 and ADCA or 'A' level from DOEACC or equivalent from MS University or any Bachelor Degree is eligible for lateral entry into 3rd year.
- A candidate who has passed Bachelor Degree with PGDCA or equivalent is eligible for lateral entry into 4th year.
- A candidate who has passed M.Sc. (Computer Science or Information Technology) is eligible for lateral entry into 5th year.

c. Multi Exit Policy:

- If a student wishes to discontinue the opted Course after successfully completion of 1st year, he/she will be awarded with the Diploma in Computer Application (DCA)
- If a student wishes to discontinue the opted Course after successfully completion of 2nd year, he/she will be awarded with the Advance Diploma in Computer Application (ADCA)
- If a student wishes to discontinue the opted Course after successfully completion of 3rd year, he/she will be awarded:
 - Graduate student will get PGDCA
 - 10+2+ADCA student from MSU will get BCA
- If a student wishes to discontinue the opted Course after successfully completion of 4th year, he/she will be awarded with the Master of Science in Computer Science (M.Sc in CS)

4. Duration of the program

The duration of this program is Five Years. Candidate should clear the Program within ten years of registration to the program else they have to register afresh.

5. Medium of Instruction

The medium of instruction of this program is English. Examination must be written in English only.

6. Program Structure

The program of Integrated MCA consists of 37 subjects of 100 marks each (80 marks theory + 20 marks internal assessment through assignment) and 2 project report and Viva Voce

7. Internal Assessment and Continuing Evaluation

Internal Assessment marks will be evaluated on the basis of following criteria:

a. Theory Paper:

- a. Attendance – 5 marks
- b. Two assignments – 10 marks
- c. One Internal Test – 5 marks

b. Practical Paper:

- a. Practice on Computer – 10 marks
- b. Record Book – 5 marks
- c. Assignment – 5 marks

8. Contact classes

Online Campus, Bangalore provide Contact Classes that combines all three forms of learning namely, Online Classes, Classroom Training and Recorded Video Lectures

9. Project Work

- a. Every candidate must submit a project report before the commencement of the final year examination without which candidates will not be permitted to appear for the said examination. Project must be done under the guidance of a recognized guide.
- b. Project may be of any following types
 - i. Case study (covering a particular organization/industry)
 - ii. Field study
 - iii. Free Lance project

Project report must contain a certificate from the guide/supervisor. Candidates must submit a brief synopsis of the project mentioning.

- i. Statement of the problem
- j. Objectives of the study
- k. Research Methodology

Submission of Project Report

Two copies of Project Report must be submitted to the Registrar – Evaluation, Manonmaniam Sundaranar University.

Project Evaluation

Project report shall be evaluated for 150 marks and viva – voce for 50 marks will be conducted after the examination.

10. Scheme of Examination

1. The University Examination for Calendar year batch will be held in January and for academic year batch it will be held in July.
2. Repeaters can appear for any of these 2 examinations
3. Examinations centers in which the candidate has to appear examinations will be intimated individually through email/SMS.
4. Candidates must submit the following documents issued by the study centers along with examinations registration form.
 - a. Certificate of writing the internal test.
 - b. Certificate of submission of assignment.
 - c. Certificate for attending contact classes.
5. Evaluation of each subject is divided into 2 parts:
 - a. University Year end examinations for 80 marks of each subject
 - b. Internal assessment for 20 marks of each subject.
6. Duration of the examination will be 3 hours.
7. Candidate shall complete their internal assessment program before commencement of the year end examinations.
8. Candidates shall submit the project report in the final year.
9. Viva-voce will be conducted by Registrar- Evaluation, Manonmaniam Sundaranar University in co-ordination with ONLINE CAMPUS at the specified examination centres.

11. Passing Marks

1. Candidates must secure a minimum of 10 marks in the internal assessments
2. Candidates must secure a minimum 40 marks in theory examination out of 80 marks in each subject and aggregate or 50 marks including internal assessment marks should be obtained to pass in the course
3. Minimum of 75 marks should be scored out of 150 marks in case of project report and minimum of 25 marks out of 50 in Viva-Voce.

12. Award of Degree

After successful completion of university examinations of all papers, degree of Integrated Master of Computer Application (IMCA) will be awarded by Manonmaniam Sundaranar University

13. Classification of Successful Candidates

Candidates shall be entitle for the declaration of class upon successful completion of all the papers in a single appearance

- First Class with Distinction – 75% and above
- First Class – 60% and above but below 75%
- Second Class – 50% and above but below 60%

14. Scheme of Distribution of Marks

1st Year	Theory	Minimum for Pass	Internal	Minimum for Pass	Total	Minimum for Pass
1.1 Computer Fundamentals	80	40	20	10	100	50
1.2 Mathematics	80	40	20	10	100	50
1.3 IT Tools and Applications	80	40	20	10	100	50
1.4 Communication Skills	80	40	20	10	100	50
1.5 Computerized Accounting	80	40	20	10	100	50
1.6 Programming in C & C++	80	40	20	10	100	50
1.7 C & C++ Lab	80	40	20	10	100	50
1.8 IT Tools Lab	80	40	20	10	100	50
2nd Year	Theory	Minimum for Pass	Internal	Minimum for Pass	Total	Minimum for Pass
2.1 Java & Java Script	80	40	20	10	100	50
2.2 Digital Systems	80	40	20	10	100	50
2.3 Numerical Analysis in Computer Programming	80	40	20	10	100	50
2.4 Computer Organization and Computer Architecture	80	40	20	10	100	50
2.5 Data Structure and Algorithms	80	40	20	10	100	50
2.6 Web Designing using ASP	80	40	20	10	100	50
2.7 Java Lab	80	40	20	10	100	50
2.8 Web Designing Lab	80	40	20	10	100	50

3rd Year	Theory	Minimum for Pass	Internal	Minimum for Pass	Total	Minimum for Pass
3.1 Database Management Systems	80	40	20	10	100	50
3.2 Visual Basic	80	40	20	10	100	50
3.3 Software Engineering	80	40	20	10	100	50
3.4 Computer Networks	80	40	20	10	100	50
3.5 Operating System	80	40	20	10	100	50
3.6 Visual Basic Lab	80	40	20	10	100	50
3.7 DBMS Lab	80	40	20	10	100	50
3.8 Mini Project	80	40	20	10	100	50
4th Year	Theory	Minimum for Pass	Internal	Minimum for Pass	Total	Minimum for Pass
4.1 Discrete Mathematics	80	40	20	10	100	50
4.2 Visual C++	80	40	20	10	100	50
4.3 Web Programming	80	40	20	10	100	50
4.4 Computer Graphics	80	40	20	10	100	50
4.5 Object Oriented Analysis and Design	80	40	20	10	100	50
4.6 Unix and Linux	80	40	20	10	100	50
4.7 Visual C++ Lab	80	40	20	10	100	50
4.8 Web Programming Lab	80	40	20	10	100	50
5th Year	80	40	20	10	100	50
5.1 Wireless Application Protocol	80	40	20	10	100	50
5.2 Advanced Java Programming	80	40	20	10	100	50
5.3 Information Security	80	40	20	10	100	50
5.4 .Net Programming	80	40	20	10	100	50
5.5 Data Mining and Data Warehousing	80	40	20	10	100	50
5.6 Software Testing and Quality Management	80	40	20	10	100	50
5.7 .Net Lab	80	40	20	10	100	50
5.8 Project and Viva	-	-	-	-	200	100

15. Question Paper Pattern

Section A (5X5 = 25 Marks) Answer any 5 questions from this section each question carries 5 marks (out of Eight questions)

Section B (5X15 = 75 Marks) Answer any 5 questions from this section, each question carries 15 marks (out of Eight question)

16. Course fee

a. Candidate are required to purchase two Demand Drafts at the time of admission. One drawn in favour of "The Registrar, MS University", payable at Tirunelveli of Rs. 2550/- and another Demand Draft drawn in favour of "ONLINE CAMPUS", payable at Bangalore of Rs. 5950/-.

The Examination fee of Rs. 1000/- should be paid through a Demand Draft drawn in favour of 'The Registrar, Manonmaniam Sundaranar University' payable at Tirunelveli, once the Examination Notification is issued by the Registrar-Evaluation.

17. Syllabus of Program

This syllabus is specially designed to shape the individuals into a successful professional. This is a comprehensive program which encompasses various aspects of this field. Institute and the University reserves the right to change or re-schedule the curriculum as per the requirement of the industry.

Detailed Syllabus

1st Year

1.1 COMPUTER FUNDAMENTALS

UNIT - I

Basics of Computing: Introduction & Characteristics of Computer, Generation of Computers, Classification Computers, Micro, Mini, Main Frame, Super, Components of Computer, Input Devices, Output Devices, Processing Devices, Memory Devices

Number Systems: Type of Number System ,Positional NS ,Non-Positional NS, Converting from one Number System to another , Binary to Decimal & Decimal to Binary , Octal to Decimal & Decimal to Octal, Hexa to Decimal & Decimal to Hexa, Binary to Octal, Binary to Hexa

UNIT - II

Processor: Function and Structure, CPU, Main Components of CPU, Instruction Execution, MAR, MBR, PC, IR, ALUs, Central Processing Unit (CPU)

Memory Organization: Primary storage, Storage location & Address, Storage capacity, RAM ROM, PROM, EP.ROM, EEPROM, Cache Memory, and Virtual Memory, Secondary Storage, Sequential & Direct Access Devices, Magnetic Disk, Floppy Disk, Data Organization & Format, Access Time, Seek Time, Latency Time, Optical Memory, CD-ROM, WORM, Erasable Optical Disk

UNIT - III

Input and Output services: Input concepts, Keyboard, Mouse, Trackballs, Joysticks, Scanner, Input devices, Output concepts. Output services ,Monitor ,Printer , Non-impact Printers, Ink jet, Liquid Ink-jet Printers, Laser ,Thermal Wax Printers , Color Laser Printers ,Impact Printers, Daisy wheel.

Computer Software: Difference between Hardware & Software, Applications, System Software, Generation of Languages, Machine, Assembly, High level, Fourth Generation Language, Translators, Compiler, Interpreter, Assembler

Operating System: Evolution of Operation System, Serial Processing, Batch Processing, Multiprogramming, Types of OS, Batch, Multi Programming, NOS, Dist. OS

UNIT - IV

MS - DOS: Introduction to DOS, History and Different parts of DOS, Computer File in DOS, Directory Structure of DOS, System Prompt, Default Drive, Changing Default Drive , File & Director, DOS keys and File name, Commands, Internal, External Command.

UNIT - V

Security: Security, Principles of cryptography, Diff. between privacy & security ,Security Status on PC, Physical Security, Software Security, Networking Security, Password Security

Data Communication & Computer Network: Data Transmission Modes, Simplex, Half, Full duplex. Transmission Media, Two Wire, Twisted Pair, Untwisted Pair Cable, Coaxial, Fiber Optics, N/W Concepts & Classification, LAN, WAN, MAN

Virus: History, Type Of virus, Category of Virus, Boot Infectors ,System Infectors, General , Executable Infectors, Prevention.

Reference Books :

1. Computer Fundamentals, Sapna Book House
2. Computer Fundamentals, O. P. Nagpal – S. Chand Group
3. Computer Fundamental – Dr. Larry Long – Wiley
4. Fundamental of Computer – Akash Sexena, Sunil Chauhan, Kratika Gupta – Laxmi Publication
5. Fundamental of Computing – J B Dixit – Laxmi Publication

1.2 MATHEMATICS

UNIT – 1:

Characteristic equation – Eigen Values and Eigen Vectors – Properties – Problems – Rank of Matrix – Problems – Solutions of simultaneous equations using matrices – consistency condition. Polynomial equations – relation between roots and coefficients imaginary roots and irrational roots – solving equations under given conditions – transformation of equations.

UNIT – II:

Definition of a derivative, different types of differentiation – standard formulae – successive differentiation – n^{th} derivative – Leibnitz formula – problems. Partial differentiation – Euler's theorem – Curvature – Radius of curvature in Cartesian co-ordinates.

UNIT - III :

Integration by Parts : $\int_0^{\frac{\pi}{2}} \sin^n x dx$ $\int_0^{\frac{\pi}{2}} \cos^n x dx$, $\int_0^{\frac{\pi}{2}} \tan^n x dx$, $\int_0^a x^n e^{ax} dx$, $\int_0^a x^n e^{-x} dx$ Definite integrals – properties – reduction formulae – Problems. Second order differential equations with constant coefficients – Particular Integrals of type $e^{ax}V$ - where V is x or x^2 or $\cos ax$ or $\sin ax$

UNIT – IV :

Definition Complete, - Singular and General integrals solutions of Standard types $f(p, q) = 0$, $f(x, p, q) = 0$, $f(y, p, q) = 0$, $f(z, p, q) = 0$, $f_1(x, p) = f_2(x, p)$ – Clairant's form – Lagrange's equation $Pp + Qq = R$ – Problems.

UNIT - V:

Definition – Laplace transform of standard function simple theorems – problems inverse Laplace transform – Fourier coefficients – periodic functions with period $2p$ – half range series – cosine series – sine series – problems.

Reference Books :

1. Mathematics, K Kundan, Puliani Book House
2. Discrete Mathematics, Subhash G Deo, Neeraj Publications

1.3 IT TOOLS AND APPLICATIONS

UNIT I

Fundamentals of Computers – Characteristics of Computers, History of Computers, Technical Evolution of Computers, Categories of Commercial Computers, Systems Software, Application Software, Uses and Impact of Computers, Central Processing Unit, Types of Computer Memory, Number System, Input Concepts, Input Devices, Output Concepts, Output Devices, Soft Copy Devices, Storage Devices, File Organisation

UNIT II

Disk Operating Systems and Windows - DOS Files, Organising Files, DOS Commands, Preparing Fixed Disk, Making more memory available, Control Keys Functions, Windows all versions, Starting and Quitting a Program, Organising Files and Folders, Setting up a Printer, Commonly used Commands, Network Neighborhood, Shared Folders or Printers, Optimizing Computer

UNIT III

Microsoft Office 2000 – MS-Word – Creating, Saving, Finding & Replacing text, Copying and Moving Text, Creating hyperlinks, Auto Text, Fonts, Underline, Boldface, Animation Effects, Subscript & Superscript, Margins, Tab Stops, Line Spacing, Alignment, Indenting, Borders and Shading, Numbering and Bullets, Header & Footers, Tables, Mail Merge

MS-Excel – Workbook, Cells, Formatting, Simple calculations, Referencing formulas, Worksheets, Copy Formulas, Graphs

MS-PowerPoint – Introduction, Preparing Presentation, AutoContent Wizard, Formatting, Editing, Printing slides, Organisation Chart, Transitions, Animations,

UNIT IV

Database Systems – Data Modeling for a Database, Data Integration, DBMS, Entity-Relationship Model, Relational Data Model, Network Data Model, Hierarchical Model, SQL, Data base Design, Normalization, Reliability, Transactions, Database Security, Distributed Databases, Expert Systems

UNIT V

Internet and Web Designing – The Internet, Commerce on Internet, Governance on Internet, Domain Names, Internal Access, World Wide Web, Web Browsers, Search Engines, “Surfing” the Net, Cookies, Downloading, Electronic Mail (E-Mail), Advantages of e-Mail, Different E-Mail Protocols, E-Mail Addresses, Junk e-mailers, Free Web Based Email Service: Hotmail, Spamming,

Reference Books :

1. Office 2003 Bible - Edward C Willett Dr. , Wiley
2. MS-Office – S S Shirvastva, Laxmi Publications

1.4 COMMUNICATION SKILLS

UNIT 1

COMMUNICATION SKILLS IN ENGLISH

Introduction-The Importance of English-English as the First or Second language-Uses of English-Other Uses of English-Presentation Skills

UNIT 2

LISTENING SKILLS

What is Listening?- Types of Listening- Objectives-Active Listening- an Effective Listening Skill- Note Taking Tips- Barriers for Good Listening- Purpose of Listening-Outlines and Signposting- Gambits

UNIT 3

READING SKILLS

Importance of Reading- Definition of Reading- Levels of Reading- Requirements of Reading- Types of Reading- Techniques of Reading- Academic Reading Tips

UNIT 4

WRITING SKILLS

What is Writing? - The Sentence- The Phrase-Kinds of Sentences- Parts of Sentence- Parts of Speech- Articles- Types of Sentences - Time Management Tips- Test Preparation Tips - Tips for Taking Exams- What is a Paragraph?- Construction of Paragraph- Letter Writing- Memo- Cover Letter-Resume writing

UNIT 5

COMMUNICATION SKILLS- SPEAKING SKILLS

Definition- Barriers of Communication- Types of Communication- Know What You Want To Say

Reference Books :

1. Communication Skills, Dr. Nageshwar Rao, Himalaya Publishing
2. Communication skills, Vineesha Gupta, Neeraj Publications

1.5 COMPUTERISED ACCOUNTING

UNIT - I

Accounting, basic accounting concepts, double entry accounting, The accounting trial, Preparation of vouchers, financial statements & their nature, sample of balance sheet, income statement, cash flow statement, the accounting equation, basic accounting terms, meaning of rules of debit and credit, ground rules of journalisation, basics of journal entries, examples of journal entries, bank reconciliation statement.

UNIT - II

Introduction to Tally: Features of Tally 9, Advanced features of Tally 9, Installation Procedure of Tally 9, Components of the Gateway of Tally, Creating a Company, Groups, Ledgers, Vouchers, Orders, Cost Centres and Categories: Introducing Groups, Introducing Ledgers, Introducing Vouchers, Purchase Orders, Sales Order, Invoices, Cost Categories and Cost Centres

UNIT - III

Stock and Godown in Tally: Stock Groups, Stock Categories, Stock Items, Units of Measure, Godowns, Reports in Tally: Balance Sheet, The Stock summary Report, Ratio Analysis, Trial Balance, Day Book

UNIT - IV

Payroll: Pay Heads, Employee Groups, Employees, Salary Details, Units (Work), Attendance/Production Type, Payroll Vouchers, Attendance Vouchers, Payroll Voucher entry, Payroll Reports, Salary Disbursement, Taxation: Indian Tax Structure, TDS in Tally 9, TCS in Tally 9, TDS, TDS Reports in Tally 9, TCS in Tally, Printing a TCS Challan, TCS Reports in Tally 9, Computing VAT in Tally 9, VAT Classification, VAT Reports in Tally 9, Service Tax Accounting, FBT Accounting

UNIT - V

Tally Vault and Email in Tally: Backup in Tally, Resorting Data in Tally, Security Control, Creating Users and Passwords in Tally, Setting the Tally Vault Password, Email in Tally, Important Features of Tally: Creating a Currency, Displaying Currency, Altering Currency, Deleting Currency, Rate of Exchange, Budget, Scenario Management Tally ODBC

Reference Books :

1. Complete Tally - , Nadhani, BPB Publishing
2. Mastering Tally - , Dr. Mittal, Rana, Khana Book Publishing Housing Co.
3. Mastering Tally.ERP9 – Dinesh – Laxmi Publisher
4. Accounting Theory, L S Porwal, Tata McGraw Hill Publishing
5. Accounting Principles, Robert N Anthony, AITBS Publishers and Distributors
6. Tally 9 Train Guide, Computer Book Centre
7. Computer and Financial Accounting with Tally 9.0, Vikas Gupta, Dreamtech Publisher

1.6 PROGRAMMING IN C & C++

Unit-I

Problem Solving - Algorithm - Characteristics of Algorithm - Implementation of Algorithm - Analysis and Efficiency of Algorithm - Fundamental Algorithms - Array Techniques - Searching, Sorting and Merging Techniques - Text Processing and Pattern Search - Dynamic Data Structure Algorithms - Recursive Algorithms - Flow Charting - Flow Chart Types - Flowchart Symbols - Decision Table - Psudeocode - Pseudocode (Using user input, files, reports, and output on paper/console)

Unit-II

C Language: Constants, Variables, Programming Techniques - History of C Language - Structure of a C Program - Variables ; Operators: Operators - Type Modifiers - Expressions - Type Definitions Using typedef ; Input/Output Functions: Console I/O Functions - Unformatted Console I/O Functions ;Controls & Loops: Control Statements - Conditional Statements - Loops in C - The break Statement - The Continue Statement - The exit () Function - The goto Statement

Unit-III

Arrays, Functions: Declaration and Prototypes -Storage Classes - Command Line Arguments - Recursion in Function ;Pointers: Pointer Notation - Pointer Expressions - Pointers and One Dimensional Arrays - Malloc Library Function - Calloc Library Function - Arrays of Pointers ;Structures: Structure Definition - Structure Initialization - Arrays of Structures - Structures within Structures - Passing Structures to Functions - Structure Pointers ;File Handling: Opening - Closing - Input/Output Operations - Random Access to Files

UNIT - IV

Beginning with C++: Structure of C++ Program, Expressions and Control Structures: Identifiers and Constants, Declaration of Variables, Dynamic Initialization of Variables, Operators in C++, Expressions and Their Types, Implicit Conversions, Functions in C++ , Classes and Objects: Defining Member Functions, Making an Outside Function Inline, Nesting of Member Functions, Private Member Functions, Memory Allocation for Objects, Objects as Function arguments, Constructors and Destructors: Dynamic Initialization of Objects

UNIT - V

Operator Overloading and Type Conversions: Manipulation of strings using Operators, Rules for Overloading Operators, Inheritance Extending Class : Defined Derived Classes, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes, Virtual Functions and Polymorphism, Managing Console I/O Operations: C++ Streams, Unformatted I/O Operations - Formatted Console I/O Operations - Managing Output with Manipulators Working With Files, More about Open, Updating a File, Templates, Handling: Basics of Exception Handling - Exception Handling Mechanism

Reference Books :

1. Programming in C, K S Kahlon, Kalyani Publishers
2. Data Structure through C Language, Satish Jain, Computer Book Centre
3. D. Ravichandran, "Programming with C++", TMH, 1996.
4. Bjarne Stroustrup, "The C++ Programming Language", Addison Wesley, 2004

1.7 C & C++ Lab

PART - A

1. Write a C program to input N real numbers in ascending order into a single dimension array. Conduct a binary search for a given key integer number and report success or failure in the form of a suitable message.
2. Write a C program to input N integer numbers into a single dimension array. Sort them in ascending order using bubble sort technique. Print both the given array and the sorted array with suitable headings.
3. Write a C program to evaluate the given polynomial $f(x) = a_4x^4 + a_3x^3 + a_2x^2 + a_1x + a_0$ for given value of x and the coefficients using Horner's method. (Using single dimension arrays to store coefficients)
4. Write a C program to read two matrices A(M x N) and B(P x Q) and compute the product of A and B after checking compatibility for multiplication. Output the input matrices and the resultant matrix with suitable headings and format. (Using two dimension arrays where array size M, N, P, Q \leq 3)
5. Write C user defined functions
 - (i) to input N integer numbers into a single dimension array.
 - (ii) to conduct a linear search.

Using these functions, write a C program to accept the N integer numbers & given key integer number and conduct a linear search. Report success or failure in the form of a suitable message.

6. Write C user defined functions
 - (i) to input N integer numbers into a single dimension array.
 - (ii) to sort the integer numbers in ascending order using bubble sort technique.
 - (iii) To print the single dimension array elements.

Using these functions, write a C program to input N integer numbers into a single dimension array, sort them in ascending order, and print both the given array & the sorted array with suitable headings.

7. Write C user defined functions
 - (i) to input N integer numbers into a single dimension array.
 - (ii) to sort the integer numbers in descending order using selection sort technique.
 - (iii) To print the single dimension array elements.

Using these functions, write a C program to input N integer numbers into a single dimension array, sort them in descending order, and print both the given array & the sorted array with suitable headings.

8. Write C user defined functions
 - (i) to input N real numbers into a single dimension array.
 - (ii) compute their mean.

- (iii) compute their variance
- (iv) compute their standard deviation.

Using these functions, write a C program to input N real numbers into a single dimension array, and compute their mean, variance & standard deviation. Output the computed results with suitable headings.

9. Write C user defined functions

- (i) To read the elements of a given matrix of size M x N
- (ii) To print the elements of a given matrix of size M x N
- (iii) To compute the product of two matrices

Using these functions, write a C program to read two matrices A(M x N) and B(P x Q) and compute the product of A and B after checking compatibility for multiplication. Output the input matrices and the resultant matrix with suitable headings and format.

(Using two dimension arrays where array size M, N, P,Q \leq 3)

10. Write a C program to read a matrix A(M x N) and to find the following using user defined functions:

- (i) Sum of the elements of the specified row
- (ii) Sum of the elements of the specified column
- (iii) Sum of all the elements of the matrix

Output the computed results with suitable headings.

Part -B

1. Given that an EMPLOYEE class contains following members:

Data members : Employee_Number, Employee_Name, Basic, DA, IT, Net_Salary

Member functions: to read the data, to calculate Net_Salary and to print data members. Write a C++ program to read the data of N employees and compute Net_Salary of each employee.

(Dearness Allowance (DA) = 52% of Basic and Income Tax (IT) = 30% of the gross salary.
Net_Salary = Basic + DA - IT)

2. Define a STUDENT class with USN, Name, and Marks in 3 tests of a subject. Declare an array of 10 STUDENT objects. Using appropriate functions, find the average of two better marks for each student. Print the USN, Name, and the average marks of all the students.

3. Write a C++ program to create a class called COMPLEX and implement the following overloading functions ADD that return a COMPLEX number.

- i. ADD (a, s2) – where a is an integer (real part) and s2 is a complex number.
- ii. ADD (s1, s2) – where s1 and s2 are complex numbers.

4. Write a C++ program to create a class called LIST (linked list) with member functions to insert an element at the front of the list as well as to delete an element from the front of the list. Demonstrate all the functions after creating a list object.

5. Write a C++ program to create a template function for Quick sort and demonstrate sorting of integers and doubles.

6. Write a C++ program to create a class called STACK using an array of integers. Implement the following operations by overloading the operators + and -.

i. $s1 = s1 + \text{element}$; where s1 is an object of the class STACK and element is an integer to be pushed on to top of the stack.

ii. $s1 = s1 -$; where s1 is an object of the class STACK and - operator pops the element.

Handle the STACK Empty and STACK Full conditions. Also display the contents of the stack after each operation, by overloading the operator <<.

7. Write a C++ program to create a class called DATE. Accept two valid dates in the form dd/mm/yy. Implement the following operations by overloading the operators + and -. After every operation display the results by overloading the operator <<.

i. $\text{no_of_days} = d1 - d2$; where d1 and d2 are DATE objects, $d1 \geq d2$ and no_of_days is an integer.

ii. $d2 = d1 + \text{no_of_days}$; where d1 is a DATE object and no_of_days is an integer.

8. Write a C++ program to create a class called MATRIX using a two-dimensional array of integers. Implement the following operations by overloading the operator == which checks the compatibility of two matrices m1 and m2 to be added and subtracted. Perform the addition and subtraction by overloading the operators + and - respectively. Display the results (sum matrix m3 and difference matrix m4) by overloading the operator <<.

```
if(m1 == m2)
{
m3 = m1 + m2;
m4 = m1 - m2;
}
else
display error
```

9. Write a C++ program to create a class called OCTAL, which has the characteristics of an octal number. Implement the following operations by writing an appropriate constructor and an overloaded operator +.

i. $\text{OCTAL } h = x$; where x is an integer

ii. $\text{int } y = h + k$; where h is an OCTAL object and k is an integer.

Display the OCTAL result by overloading the operator <<. Also display the values of h and y.

10. Write a C++ program to create a class called QUEUE with member functions to add an element and to delete an element from the queue. Using these member functions, implement a queue of integers and doubles. Demonstrate the operations by displaying the contents of the queue after every operation.

11. Write a C++ program to create a class called DLIST (Doubly Linked List) with member functions to insert a node at a specified position and delete a node from a specified position of the list. Demonstrate the operation by displaying the contents of the list after every operation.

12. Write a C++ program to create a class called STUDENT with data members USN, Name and Age. Using inheritance, create the classes UGSTUDENT and PGSTUDENT having fields as Semester, Fees and Stipend. Enter the data for at least 5 students. Find the semester wise average age for all UG and PG students separately.

13. Write a C++ program to create a class called STRING and implement the following operations. Display the results after every operation by overloading the operator <<.

i. STRING s1 = "VTU"

ii. STRING s2 = "BELGAUM"

iii. STIRNG s3 = s1 + s2 ; (Use copy constructor).

14. Write a C++ program to create a class called BIN_TREE (Binary tree) with member functions to perform inorder, preorder and postorder traversals. Create a BIN_TREE object and demonstrate the traversals.

15. Write a C++ program to create a class called EXPRESSION. Using appropriate member functions convert a given valid Infix expression into Postfix form. Display the Infix and Postfix expressions.

1.8 IT Tools Lab

1. Create a document using a suitable word processing package, like MS Word, with at least three paragraphs and perform the following operations:
 - (i) Set left margin 1" and right margin 0.75"
 - (ii) Centre the heading and make it bold. Increase the font size
 - (iii) Underline the specified words in the document and change them to italics
 - (iv) Conduct spell check and correct them suitably
 - (v) Demonstrate use of numbering and bullets
 - (vi) Exchange paragraphs 2 and 3 using cut and paste facility
 - (vii) Put suitable headers and footers
 - (viii) Count the number of words and lines
 - (ix) Demonstrate use of drawing tools
 - (x) Include suitable logo/emblem/symbol
2. Create a formal letter using a suitable word processing package, like MS Word, to place a purchase order for procurement of books, having the following information.

Sl. No.	Title of the book	Details of the book			No. of copies
		Author	Edition	Publisher	

3. Create a document and apply alignment and edit properties.
4. Create a table and apply its various properties
5. Mail Merge

MS-EXCEL

6. Create an Excel Sheet and perform the following operations.
 - a. Cell Formatting
 - b. Entering Text in Cells.
7. Create Chart applications
8. Create a Worksheet and apply mathematical functions.

MS-POWERPOINT

9. Create Slides with different layout and apply different backgrounds.
10. Create Slide with links and change the order of slides.
11. Create a slide with custom animation.

2nd Year

2.1 JAVA and JAVASCRIPT

Unit-I:

Fundamentals Of Object Oriented Programming, JAVA Evolution, Overview Of JAVA Language: Introduction -JAVA Program Structure – JAVA Tokens – JAVA Statements – Implementing A JAVA Program – JAVA Virtual Machine – Command Line Arguments .

Unit -II:

Constants, Variables And Data Types, Operators And Expressions, Decision Making And Branching, Decision Making And Looping.

Unit –III:

Classes, Objects And Methods, Arrays, Strings And Vectors, Interface: Multiple Inheritance, Packages: Putting Classes Together ,Multithreaded Programming.

Unit-IV

Managing Errors And Exceptions, Applet Programming, Graphics Programming: Managing Input / Output Files in JAVA..

Unit-V:

Introduction to JavaScript, placing JavaScript in an HTML file, using variables, using functions, event handlers, Objects: predefined JavaScript objects ,the document object, window object, JavaScript arrays, math and date object, handling strings, JavaScript and forms.

TEXT BOOKS:

1. "Programming with JAVA", E.Balagurusamy. T.M.H, New Delhi. 2nd Edition.
(Unit – I to Unit –IV)
- 2."JavaScript a beginners Guide" John Pollock T.M.H,New Delhi (Unit V)

2.2 DIGITAL SYSTEMS

UNIT - I

Number Systems and Boolean Algebra

Number systems and codes: Binary, octal, and hexa- decimal number systems, binary arithmetic, binary code, excess-3 code, gray code, error detection and correction codes. Boolean algebra: Postulates and theorems, logic functions, minimization of Boolean functions using algebraic, Karnaugh map and Quine – McClausky methods,

UNIT - II

Logic Families

Logic families: TTL, CMOS, Tri state logic, electrical characteristics.

UNIT - III

Design of Combinational Circuits

Realizing logical expressions using different logic gates and comparing their performance. Realizing combinational functions using available hardware devices: addition, subtraction, multiplication, code conversion, decoding, comparison, multiplexing and demultiplexing. Hardware aspects related to logic design: delays and hazards

UNIT - IV

Sequential Circuits

Structure of sequential circuits: Moore and Mealy machines. Flip-flops, excitation tables, conversions, practical clocking aspects concerning flip-flops, Realization of sequential functions using sequential MSIs: counting, shifting. Analysis of sequential circuits: State tables, state diagrams and timing diagrams. Design of sequential circuits: Functional partitioning, state assignment, output racing

UNIT - V

Digital Hardware Devices

Memory devices: ROM, RAM, EPROM, and Flash memory. Programmable Logic Devices: Architecture of PLDs, and implementation of circuits using PLDs.

Reference Books :

1. Digital Systems: Principles And Applications, Ronald J Tocci, Neal S Widmer, Prentice Hall College Div
2. Digital Systems Engineering, Poulton John W., Dally William J.

2.3 NUMERICAL ANALYSIS IN COMPUTER PROGRAMMING

UNIT - I

Approximations and round off errors, Truncation errors and Taylor Series, Determination of roots of polynomials and transcendental equations by Newton-Raphson, Secant and Bairstow's method, Solutions of linear simultaneous linear algebraic equations by Gauss Elimination and Gauss- Siedel iteration methods.

UNIT - II

Curve fitting- linear and nonlinear regression analysis, Backward, Forward and Central difference relations and their uses in Numerical differentiation and integration, Application t of difference relations in the solution of partial differential equations, Numerical solution of ordinary differential equations by Euler, Modified Euler, Runge-Kutta and Predictor-Corrector method.

Computer Programming

UNIT - III

Introduction to computer programming in C and C++ languages. Arithmetic expressions, Simple programs, Dissection of the program line by line, Concepts of variables, C data types, int, char, float etc, C expressions, arithmetic operations, relational and logic operations, C assignment statements, C primitive input output using getchar and putchar, exposure to the scant and printf functions, C statements

UNIT - IV

Concepts of loops, example of loops in C using for, while and do-while, Optionally continue may be mentioned, One dimensional arrays and example of iterative programs using arrays, 2-d arrays. Use in matrix computations, Concept of Sub-programming, functions. Example of functions

UNIT - V

Pointers, relationship between arrays and pointers, Array of pointers, Passing arrays as arguments, Strings and C string library, Structure and unions. Defining C structures, passing structures as arguments, Program examples, File I/O. Use of fopen, fscanf and fprintf routines.

Reference Books :

1. C ++ and Object - oriented Programming, Jeevan Kumar, Neeraj Publications
2. Computer - oriented Numerical Techniques, Subhash G Deo, Neeraj Publications

2.4 COMPUTER ORGANISATION AND COMPUTER ARCHITECTURE

UNIT I

Number system Binary, Decimal, Octal, and Hexadecimal – Conversion from one to another – Complements – Binary Codes. Basic logic Gates – Basic Theorems and Properties of Boolean Algebra – NAND, NOR implementation – Sum of Products – Product of Sums – Karnaugh Map – Tabulation – Don't Care Conditions.

UNIT II

Combinational Logic Circuit Design: Multiplexers – Demultiplexers – Decoders – Encoders - Half Adder – Full Adder - Subtractor – Parallel Adder. Flip-flops: RS, D, JK Flip-flop – Registers – Shift Registers – Ripple Counters Synchronous Counters.

UNIT III

Register Transfer and Micro Operation: Arithmetic Register Transfer Language – Register Transfer, Logic Bus and Memory Transfers. Shift micro operations – Arithmetic Logic Shift unit – CPU: Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation, Program Control.

UNIT IV

Micro programmed Control: Control Memory – Address Sequencing Conditional Branching - Mapping of Instructions – Microprogram Example: Computer Configuration – Micro instructions format – Symbolic Micro Instructions – Fetch Routine – Symbolic Micro Programme – Binary Microprogram – Computer Arithmetic: Addition and Subtraction, Multiplication Algorithm – Division Algorithm – Floating Point Arithmetic Operation.

UNIT V

Input – Output Organization: Peripheral Devices – Input - Output Interface – Asynchronous Data Transfer (Strobe & Handshaking Method) – Modes of Transfer – Priority Interrupt – DMA – IOP. Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory.

Reference Books:

1. Malvino leech, "Digital Principles and Applications", TMH, Edn.1991.
2. J. P. Hayes,"Computer Organization and Architecture", TMGH, Second Edition, 1988.
3. William Stallings, "Computer Organization & Architecture, Designing for Performance", Pearson Education, Sixth Edition, 1997.

2.5 DATA STRUCTURES AND ALGORITHMS

UNIT 1

ADVANCED CONCEPTS OF C AND INTRODUCTION TO DATA STRUCTURES: Introduction-data types-arrays-handling arrays-initializing the arrays-multidimensional arrays-initialization of two dimensional array-pointers-advantages and disadvantages of pointers-declaring and initializing pointers- pointer arithmetic-array of pointers-passing parameters to the functions-relation between pointers and arrays-scope rules and storage -classes-automatic variables-static variables-external variables- register variable-dynamic allocation and de-allocation of memory-function malloc(size)-function calloc(n,size)-function free(block)-dangling pointer problem.-structures.-enumerated constants-unions

COMPLEXITY OF ALGORITHMS: Program analysis-performance issues -growth of functions-asymptotic notations-big-o notation (O)-big-omega notation (Ω)-big-theta notation (Θ)-time-spacetrade offs-space usage- simplicity- optimality

INTRODUCTION TO DATA AND FILE STRUCTURE: Introduction-primitive and simple structures-linear and nonlinear structures-file organizations

STRINGS: Introduction-string functions-string length-using array-using pointers-string copy-using array-using pointers-string compare-using array-string concatenation

UNIT 2

ELEMENTARY DATA STRUCTURES: Introduction- stack-definition-operations on stack-implementation of stacks using arrays-function to insert an element into the stack-function to delete an element from the stack-function to display the items-recursion and stacks-evaluation of expressions using stacks-postfix expressions-prefix expression- queue-introduction-array implementation of queues-function to insert an element into the queue-function to delete an element from the queue-circular queue-function to insert an element into the queue-function for deletion from circular queue-circular queue with array implementation-deques-priority queues

UNIT 3

LINKED LISTS : Introduction-singly linked lists.-implementation of linked list-insertion of a node at the beginning-insertion of a node at the end-insertion of a node after a specified node-traversing the entire linked list-deletion of a node from linked list-concatenation of linked lists-merging of linked lists-reversing of linked list-doubly linked list.-implementation of doubly linked list-circular linked list-applications of the linked lists

GRAPHS: Introduction-adjacency matrix and adjacency lists-graph traversal-depth first search (dfs) - implementation-breadth first search (bfs)-implementation-shortest path problem-minimal spanning tree-other tasks

UNIT 4

TREES: Introduction-objectives-basic terminology-properties of a tree-binary trees-properties of binary trees-implementation-traversals of a binary tree-in order- traversal-post order traversal-preorder traversal-binary search trees (bst)-insertion in bst-deletion of a node-search for a key in bst-height balanced tree-b-tree-insertion-deletion

UNIT 5

FILE ORGANIZATION: Introduction- terminology- file organisation-sequential files-basic operations-disadvantages-direct file organization -division-remainder hashing-indexed sequential file organization

SEARCHING: Introduction-searching techniques- sequential search- analysis-binary search- analysis-hashing-hash functions-collision resolution

SORTING: Introduction-insertion sort-analysis-bubble sort analysis-selection sort - analysis-radix sort-analysis-quick sort-analysis-2-way merge sort-heap sort-heapsort vs. quicksort

Reference Books :

1. 'C' - Programming & Data Structure, S K Yadav, Neeraj Publications
2. Data Structure through C Language, Satish Jain, Computer Book Centre

2.6 WEB DESIGN USING ASP

Unit - I

Introduction to ASP: What is ASP? - ASP Model - Scripting languages - Delimiters single expressions - statements - including other files.

Understanding objects: Application object - lock - unlock - events - application on end - application on start - request object - Properties of the Response object - Methods of the response object - session object - The global.asa file.

Unit - II

Understanding components: The advertisement rotator component - the text stream component - properties of the text stream object. Working with users; The input function - Retrieving form data using text boxes and text areas.

Unit - III

Cookies: Working with Cookies - Application of Cookies - created by ASP page Drawbacks of using Cookies Web Browser compatibility Issues - Using Cookies in ASP Applications An ASP Application that uses Cookies.

Unit IV

Working with files and the File system: Copying, Moving, Deleting file, Retrieving attributes - Working with Drives and Folders. Working with connections and data sources, Creating connections with OLE DB and ODBC - Connecting to Microsoft SQL Server - Connecting to Microsoft Access Database.

Unit-V

About the Connection Object: Considering Performance and Data Protection - Executing a SQL Statement with the connection object - Advanced Methods and Properties of the Connection Object - Understanding session and connection pooling - Working with recordsets - Recordset cursor and locking types - Understanding ADO cursors - Advanced Methods and Properties of the Recordset Object - Paging Through a recordset, Working with the command object. Creating stored Procedures - Executing stores procedures with the connection object - Receiving Parameter Information.

Reference Books:

1. Thomas A.Powell, "The complete Reference HTML and XHTML", Fourth Edition, Tata McGraw Hill Pub, Company Ltd., 2000.
2. Achyut S. Godbole, Atul Kahate, "Web Technologies – TCP/IP to internet Application Architectures", TMH Pub. Company Ltd, 2003.
3. H.M. Deitel, P.J.Deitel and T.R.Nieto, "Internet and World Wide web – How to Program ", Pearson Education Asia, 2003.

2.7 Java Lab

HTML Programming Using Tags

1. Simple Web Page.
2. Hyper Linked Web Page, `<^>` `<^\\>`.
3. Web Page with Image ``.
4. Web Page with Applet `<Applet>`.
5. Web Page with Table `<TABLE>`.

JAVA Programming List

6. Program to create a simple applet and application
7. Using java class and objects
8. Using java Inheritance and Interface
9. Using Arrays in java
10. Using Exceptions
11. Using Threads and Multithreads
12. Using AWT package
13. Using I/O package

2.8 WEB DESIGNING LAB

3rd Year

3.1 DATABASE MANAGEMENT SYSTEMS

Unit -1

Introduction to Database System and Database Models

Database System: Introduction - Objectives - Traditional file oriented approach - Motivation for database approach - Database Basics - Three views of data - The three level architecture of dbms - Database management system facilities - Elements of a database management system - Advantages and disadvantages of dbms - Self test – Summary

Database Models: Introduction - Objectives - File management system - Entity-relationship (e-r) diagram - The hierarchical model - The network model - The relational model - Advantages and disadvantages of relational approach - An example of a relational model - Self test - Summary

Unit- 2

File Organisation for dbms and Representing Data Elements

File Organisation: Introduction - Objectives - File organization -Sequential file organisation - B-trees Direct file organization - Need for the multiple access path - Self test –Summary

Representing Data Elements: Data elements and fields - Representing relational database elements - Records -Representing block and record addresses - Client-server systems - Logical and structured addresses - Record modifications - Index structures - Indexes on sequential files - Secondary indexes - B-trees - Hash tables - Self Test

Unit- 3

Relational Model and Normalization

Relational Model: Introduction - Objectives - Concepts of a relational model - Formal definition of a relation - The codd commandments – Summary

Normalization: Functional dependency - Normalization - Self test – Summary

Unit-4

Structured Query Language, Relational Algebra, Management Considerations

Structured Query Language: Introduction of sql - Ddl statements - Dml statements - View definitions - Constraints and triggers - Keys and foreign keys - Constraints on attributes and tuples - Modification of constraints - Cursors - Dynamic sql

Relational Algebra: Basics of relational algebra - Set operations on relations - Extended operators of relational algebra - Constraints on relations - Self test - Summary

Management Considerations: Introduction - Objectives - Organisational resistance to dbms tools - Conversion from an old system to a new system - Evaluation of a dbms - Administration of a database management system - Self test – Summary

Unit -5

Concurrency Control and Transaction Management

Concurrency Control: Serial and serializability schedules - Conflict-serializability - Enforcing serializability by locks - Locking systems with several lock modes - Architecture for a locking scheduler - Managing hierarchies of database elements - Concurrency control by timestamps - Concurrency control by validation - Summary

Transaction Management: Introduction of transaction management - Serializability and recoverability - View serializability - Resolving deadlocks - Distributed databases - Distributed commit - Distributed locking - Summary

Reference Books :

1. Introducing to Database Management Systems, Neeraj Mishra, Neeraj Publications
2. Introduction to Database Management systems, J B Gupta, BPB Publications

3.2 VISUAL BASIC

Unit: I

Welcome to VB: What is Visual Basic - Features of Visual Basic - Visual Basic Editions - The Visual Basic Philosophy - Developing an Application? Creating an Application: Objectives- The Tool Box - Project Explorer - The Properties Window - The Form Window - What does Visual Basic 6 have for you to create Applications.2nd Look at IDE, Forms and controls: Objectives - The Form - The Working with a Control - Opening the Code Window. Variables in Visual Basic: Objectives - What is a Variable.

UNIT-II

Writing Code in VB: Objectives - The Code Window - The Anatomy of Procedure- Editor Features - The For.. Next Statement - The Decision Maker... If..Loop - The While loop - Selective Case... End Select. Working with Files: Objectives - Visual Basic File System Controls - Types of Files - Working with Files.

UNIT-III

Menus: Objectives - Building the User Interface. The first step - All about Menus. MDI Applications: Why MDI Forms - Features of an MDI Form- Loading MDI Forms and Child Forms - The Active Form property. Debugging Tips: Objectives - The Debugging Methods. The Common Dialog control: Working with the Common Dialog Control - The file open Dialog Box - Saving a file - Changing the color. Introduction to Databases: Why databases - What is a Database - Which Database. Working with the Data Control : The Data Control - The Bound Controls - Caution - Coding.

UNIT-IV

DOA: The Jet Database Engine - Functions of the Jet Database Engine - SQL - The DAO Object Model. Additional Controls Available in VB 6.0 - Objectives - SSTab Control. Active X data Objects - Objectives Why ADO - Establishing a Reference.

UNIT-V

Crystal and Data Reports: Crystal Reports - Data Report. Distributing your application: Objectives - Working with the Packaging and Deployment Wizard. Active X: Objectives - What is ActiveX - Why ActiveX. ActiveX and Web pages: Objectives - ActiveX and Internet. ActiveX Documents: The Application Form Document . Sample Application in VB like Inventory Control.

Reference Books:

1. Programming With Visual Basic 6.0"- Mohammed Azam, Vikas Publishing House Pvt Ltd.
2. Visual Basic 6, Ed Koop, Anne Prince, and Joel Murach

3.3 SOFTWARE ENGINEERING

UNIT –1

INTRODUCTION TO SOFTWARE ENGINEERING

Introduction of software - The evolving role of software - Software characteristic - Types of software - Software application - What is software engineering - Software engineering concepts - What does software engineering involve - Importance of software engineering - Principles of software engineering

SOFTWARE ENGINEERING APPROACHES, PROBLEMS, CRISIS AND MYTHS

Software engineering approach - Software engineering problem - Causes of the problem – Software crisis - Software myths - Management Myths - Customer Myths - Practitioner’s Myths - Bringing formality to the software development process

UNIT-2

THE PROCESS, DESIGN CONCEPTS AND MODELS

Software process - Characteristics of software process - Software process, projects & products - Design concept and modeling – Concepts - Design Objectives - Design Principles - Software engineering process models - Waterfall Model - It’s Advantages and Limitations - Prototype Model - It’s Advantages and Limitations - Prototype’s effect on software development cost - Iterative Enhancement Model – Spiral Model - COCOMO Model

UNIT 3

PROJECT SCHEDULING AND TRACING

Software project planning - Estimation of a project - Cost estimation - Building cost estimation – models - Process-based estimation - Project scheduling and tracing - Design tools and techniques - Structure charts - Gantt charts - Activity networks - Structured design methodology - Identify the input and output data elements

RISK ANALYSIS

Software project planning - Introduction to risk analysis - Risk assessment - Risk evaluation – Risk management

SOFTWARE METRICS

Project management concept - Software project metrics - Software metrics - Software metrics type - Software metrics steps - Software metrics rules - Software metrics objective

UNIT –4

SOFTWARE QUALITY

Introduction of software quality - Factors of software quality - Software quality assurance – Activities - Formal technical review - Phases of ftr - Software configuration management

COUPLING AND COHESION

Introduction to Coupling – Definition - Factors affecting coupling - Introduction to Cohesion - Levels of cohesion - Coincidental-Logical cohesion - Temporal cohesion - Procedural cohesion - Communicational cohesion - Sequential cohesion - Functional cohesion

CODING

Introduction - Programming practice - Top-down and bottom-up- Structured programming –Hiding information - Verification & validation - Good coding style

UNIT-5

SOFTWARE TESTING STRATEGIES

Strategic approach to software testing - Unit testing - Integration testing - Validation testing - System testing - The art of debugging

MAINTENANCE

Introduction - Categories of maintenance - Corrective maintenance - Adaptive maintenance - Perfective maintenance - Maintenance characteristic - Structured versus unstructured - maintenance - Maintenance tasks - A maintenance organization - Flow of events - Maintenance side effects - Coding side effects - Data side effects - Documentation side effects - Maintaining "alien code"

Reference Books:

1. Fundamentals of Software Engineering, Rajib Mall, Prentice - Hall of India
2. Richard Fairly, "Software Engineering Concepts", TMGH, 1997
3. Roger S. Pressman, "Software Engineering a Practitioner's Approach", Fifth Edition, Mc Graw-Hill Higher Education.
4. Rajib Mall, " Fundamentals of Software Engineering", PHI, Second Edition
5. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, "Fundamentals of Software Engineering", Second Edition, PHI/ Pearson Education Asia.

3.4 COMPUTER NETWORKS

UNIT 1 INTRODUCTION TO COMPUTER NETWORK AND OSI PROTOCOL ARCHITECTURE

INTRODUCTION TO COMPUTER NETWORK: Introduction to Computer Network-What is Computer Network -Key Issues For Computer Network-Classification of Computer -Network-LAN-MAN-WAN-What is Internet?-Some Terminologies-LAN Topologies-Bus-Ring-Star-Tree-Introduction of OSI Reference Architecture

OSI PROTOCOL ARCHITECTURE : Protocols and Protocol Architecture-The OSI Protocol Architecture-Layered Architecture-Peer-to-Peer Processes-Interfaces between Layers-Layer Organisation-Layers in the OSI Model-The TCP/IP Protocol Architecture-General Comparison - between OSI and TCP/IP-Who's who in Standards?

UNIT 2 PHYSICAL LAYER AND DATA LINK LAYER

PHYSICAL LAYER: Introduction-Coding Data in Signals-Communication Modes-Simplex -Half-duplex -Duplex or full-duplex -Transmission Modes-Bit synchronization-Byte synchronization-Frame -synchronization-Transmission Media-Guided-Twisted Pair-UTP and STP-Coaxial Cable-Fiber Optics - Unguided -Microwave Transmission -Satellites Transmission-Signal Propagation vs. -Transmission Delay

DATA LINK LAYER-The Introduction of Ethernet-History of Ethernet-Ethernet Technologies-Types of Ethernet-Ethernet cabling-Manchester encoding-Switched Ethernet-Fast Ethernet-Gigabit Ethernet-IEEE 802.2 logical link control-Data Link Layer Design Issues-Framing-Error control-Flow control-Error detection and correction-Error-correcting codes-Error-detecting-deleting codes-Data link protocol-HDLC

UNIT 3 NETWORK LAYER

Introduction-Addressing in TCP/IP -Internet Protocol-Internet (IP) Addressing -Routing of IP packets -IP Datagram-IP Datagram header -Checksum calculation-Fragmentation-ARP - Address Resolution Protocol -ARP Overview -ARP Packet format-RARP - Reverse Address Resolution Protocol-ICMP - Internet Control Message Protocol-Types of ICMP messages-ICMP message format-Error reporting messages-Query Messages

UNIT 4 TRANSPORT LAYER

Introduction-UDP - User Datagram Protocol-Process-to-Process Communication-Port Numbers-Socket Addresses-UDP Datagram-UDP Checksum Computation-UDP Operation-Use of UDP-TCP - Transmission Control Protocol-Services offered by TCP-TCP Segment-Connection in TCP-Flow Control mechanism in TCP-Error Control mechanism in TCP-TCP operation

UNIT 5 APPLICATION LAYER

Introduction-Client Server Model-Client-Server-Concurrency-Connectionless Iterative Server-Connection-Oriented Concurrent Server-Processes-FTP (File Transfer Protocol) - An example network application.-Control Connection-Data Connection-Communication-Command Processing-File Transfer

Reference Books:

1. Computer Networks, Andrew S Tanenbaum, Pearson Education
2. William Stallings, "Data and Computer Communications", PHI, 2000.
3. R.S. Rajesh, K.S.Eswarakumar, R.Balasubramanian, "Computer Networks - Fundamentals & Applications", Vikas Publishing House PVT LTD, 2002.
4. Behrouz A. Forouzan, "Data Communication and Networking", 2nd Edition, TMH, Reprint 2002.
5. Brijendra Singh, "Data Communications and Computer Networks", PHI

3.5 OPERATING SYSTEM

UNIT - I

Introduction to operating systems: Introduction of operating system-quality of operation system-feature of operating system-architecture of operating systems-operations of os-classification of operating systems-evolution of operating system-serial processing -batch processing-multiprogramming-types of operating system-single-user, single tasking -single-user, multi-tasking -multi-user, multi--tasking -real-time operating system-batch -timesharing-personal computing

Process management: Introduction-definition of a process-process concepts-process state - process scheduling-types of scheduler-long term -short term-medium term-scheduling and performance criteria-scheduling algorithms-FIFO-SJF-round robin-multilevel queue scheduling-priority based scheduling-multilevel feedback queue scheduling-multiple-processor scheduling-real-time scheduling

UNIT - II

Introduction to virtual memory: Introduction-basic of virtual memory-objective-paging-demand paging-basic concept -process creation-page replacement-allocation of frames-thrashing Paging-pre paging-page sizing-inverted page table

Interprocess communication and synchronization: Process synchronization-introduction-mutual exclusion-semaphore-properties of semaphore-synchronization tool -classic problems of synchronization

UNIT - III

Deadlock -introduction of deadlock-system model -deadlock characterization-deadlock prevention - deadlock avoidance -methods for handling

Memory Management-address binding-logical - versus physical - address space-dynamic - loading-dynamic linking and shared libraries-swapping-contiguous memory allocation-memory protection-memory allocation-fragmentation-paging-basic method-hardware support-segmentation-basic method-hardware-implementation of segment tables-segmentation with paging -multics-os/2 32-bit version

UNIT - IV

File system interface-file concept-file attribute-file operations-access methods-sequential -access-direct access-other access methods-directory structure-single level directory-two level directories-tree-structured directory-acyclic-graph directories-file-system mounting-file sharing-multiple users-remote file systems-protection

Security-the security problem -user authentication -program threats-system threats -securing systems and facilities -intrusion detection -cryptography -computer-security-classifications-computer-security

UNIT - V

UNIX: A sample login session -logging on-using the on-line man pages -using man and more - logging off- directory and file structure-file names -directories -the df program -your login directory -subdirectories -specifying files -protecting files and directories -the unix shell syntax -creating files - text editors -files as output and log files -logging your actions to a file -comparing files -searching through files - the system and dealing with multiple users -information about your processes - information about other people's processes - sending messages and files to other users - /usr/ucb/mail - pine - write - talk - addressing remote nodes - shortcuts -aliases -wildcards - directory specifications -environment variables -history -the .login and .cshrc files - job control -the fg and bg commands -starting jobs in the background - some common and useful unix commands for files

Reference Books:

1. Andrew S.Tanenbaum, "Operating Systems-Design And Implementation", Albert S.Woodhull, Second Edition, PHI/Pearson Education.
2. William Stallings, "Operating Systems", Fifth Edition, Pearson Education Asia, 2005.
Silberschatz.A, Galvin.Pand Gagne.G, "Operating System Concepts", John Wiley & Sons, Fifth Edition, 2002.

3.6 Visual Basic Lab

1. Construction of an Arithmetic Calculator (Simple).
2. Preparation of Students Mark Sheet.
3. Personal Information System (Using Tables).
4. Quiz Program System (Using Tables).
5. Railways Reservation System (Using Tables).
6. Voters Information System (Using Tables).
7. Library Information System (Using Tables).

3.7 DBMS Lab

1. Consider the Insurance database given below. The primary keys are underlined and the data types are specified:

PERSON (driver – id #: String, name: string, address: string)

CAR (regno: string, model: string, year: int)

ACCIDENT (report-number: int, accd-date: date, location: string)

OWNS (driver-id #:string, Regno:string)

PARTICIPATED (driver-id: string, Regno:string, report-number:int, damage amount:int)

- (i) Create the above tables by properly specifying the primary keys and the foreign keys.
- (ii) Enter at least five tuples for each relation.
- (iii) Demonstrate how you
 - a. Update the damage amount to 25000 for the car with a specific Regno in the ACCIDENT table with report number 12.
 - b. Add a new accident to the database.
- (iv) Find the total number of people who owned cars that were involved in accidents in 2008.
- (v) Find the number of accidents in which cars belonging to a specific model were involved.
- (vi) Generate suitable reports.
- (vii) Create suitable front end for querying and displaying the results.

2. Consider the following relations for an order processing database application in a company:

CUSTOMER (cust #: int , cname: string, city: string)

ORDER (order #: int, odate: date, cust #: int, ord-Amt: int)

ORDER – ITEM (order #: int, item #: int, qty: int)

ITEM (item # : int, unit price: int)

SHIPMENT (order #: int, warehouse#: int, ship-date: date)

WAREHOUSE (warehouse #: int, city: string)

- (i) Create the above tables by properly specifying the primary keys and the foreign keys.
- (ii) Enter at least five tuples for each relation.
- (iii) Produce a listing: CUSTNAME, #oforders, AVG_ORDER_AMT, where the middle column is the total numbers of orders by the customer and the last column is the average order amount for that customer.
- (iv) List the order# for orders that were shipped from *all* the warehouses that the company has in a specific city.
- (v) Demonstrate the deletion of an item from the ITEM table and demonstrate a method of handling the rows in the ORDER_ITEM table that contain this particular item.
- (vi) Generate suitable reports.
- (vii) Create suitable front end for querying and displaying the results.

3. Consider the following database of student enrollment in courses & books adopted for each course:

STUDENT (regno: string, name: string, major: string, bdate:date)

COURSE (course #:int, cname:string, dept:string)

ENROLL (regno:string, course#:int, sem:int, marks:int)

BOOK _ ADOPTION (course#:int, sem:int, book-ISBN:int)

TEXT (book-ISBN:int, book-title:string, publisher:string, author:string)

- (i) Create the above tables by properly specifying the primary keys and the foreign keys.
- (ii) Enter at least five tuples for each relation.
- (iii) Demonstrate how you add a new text book to the database and make this book be adopted by some department.
- (iv) Produce a list of text books (include Course #, Book-ISBN, Book-title) in the alphabetical order for courses offered by the 'CS' department that use more than two books.
- (v) List any department that has *all* its adopted books published by a specific publisher.
- (vi) Generate suitable reports.
- (vii) Create suitable front end for querying and displaying the results.

4. The following tables are maintained by a book dealer:

AUTHOR (author-id:int, name:string, city:string, country:string)

PUBLISHER (publisher-id:int, name:string, city:string, country:string)

CATALOG (book-id:int, title:string, author-id:int, publisher-id:int, category-id:int, year:int, price:int)

CATEGORY (category-id:int, description:string)

ORDER-DETAILS (order-no:int, book-id:int, quantity:int)

- (i) Create the above tables by properly specifying the primary keys and the foreign keys.
- (ii) Enter at least five tuples for each relation.
- (iii) Give the details of the authors who have 2 or more books in the catalog and the price of the books is greater than the average price of the books in the catalog and the year of publication is after 2000.
- (iv) Find the author of the book which has maximum sales.
- (v) Demonstrate how you increase the price of books published by a specific publisher by 10%.
- (vi) Generate suitable reports.
- (vii) Create suitable front end for querying and displaying the results.

5. Consider the following database for a banking enterprise:

BRANCH(branch-name:string, branch-city:string, assets:real)

ACCOUNT(accno:int, branch-name:string, balance:real)

DEPOSITOR(customer-name:string, accno:int)

CUSTOMER(customer-name:string, customer-street:string, customer-city:string)

LOAN(loan-number:int, branch-name:string, amount:real)

BORROWER(customer-name:string, loan-number:int)

- (i) Create the above tables by properly specifying the primary keys and the foreign keys
- (ii) Enter at least five tuples for each relation
- (iii) Find all the customers who have at least two accounts at the Main branch.
- (iv) Find all the customers who have an account at all the branches located in a specific city.

- (v) Demonstrate how you delete tuples in ACCOUNT relation at every branch located in a specific city.
- (vi) Generate suitable reports.
- (vii) Create suitable front end for querying and displaying the results.

Instructions:

1. The exercises are to be solved in an RDBMS environment like Oracle or DB2.
2. Suitable tuples have to be entered so that queries are executed correctly.
3. Front end may be created using either VB or VAJ or any other similar tool.
4. The student need not create the front end in the examination. The results of the queries may be displayed directly.
5. Relevant queries other than the ones listed along with the exercises may also be asked in the examination.
6. Questions must be asked based on lots.

3.8 MINI PROJECT

Every candidate must submit a project report before the commencement of the final year examination without which candidates will not be permitted to appear for the said examination. Project must be done under the guidance of a recognized guide.

Project report must contain a certificate from the guide/supervisor. Candidates must submit a brief synopsis of the project mentioning.

- l. Statement of the problem
- m. Objectives of the study
- n. Research Methodology

Submission of Project Report

Two copies of Project Report must be submitted to the Registrar – Evaluation, Manonmaniam Sundaranar University.

Project Evaluation

Project report shall be evaluated for 100 marks will be conducted after the examination.

4.1 DISCRETE MATHEMATICS

UNIT 1

Set theory- Notations, representation of a set, different types of set, theorem on subsets and symmetric difference, Venn diagram, set operation –union, intersection, disjoint, difference, complement, symmetric difference, laws of sets: union, intersection, complement of sets, symmetric difference, De Morgan's laws, ordered pair Cartesian product of sets

UNIT 2

Relations: domains ,range, inverse relation, binary relations, type of relations, equivalence class, partition of a set, composition of relation, Functions, domain and range, transformation, mathematical induction-Propositional logic-truth table, connectives, negation, conjunction, disjunction, conditional, bi conditional, converse and contra positive, types of proposition, tautology, contradiction, contingency, list of properties, proof of properties

UNIT 3

Predicate, quantification, forming propositions from predicates, universal quantifier and connective and, existential, existential quantifier and connective, how to read quantified formulas, order of application of quantifier, well-formed formula for first order predicate logic, rules for constructing WFFS, from WFF to proposition, transcribing English to predicate logic WFFS-Counting-basic counting principles, sum and product rules, inclusion and exclusion principle

UNIT 4

Permutations: notations of permutations, Factorial Notation, Permutations Of N Dissimilar Things Taken R At A Time, Restricted Permutations, Permutation Of Objects Some Of Which Are Exactly Alike: Permutations Of Repeated Things, Circular Permutations, Number Of Circular Permutations Of N Dissimilar Things-Combination: Number Of Combination Of N Dissimilar Things Taken R At A Time, Theorem On Restricted Combination

UNIT 5

Logic circuit: flow table, OR, AND, NOT, NOR & NAND operation, logic circuits algebraically, Boolean Algebra-laws of Boolean algebra, duality principle-Graph Theory-graph, edges and vertices, degree of a vertex in a graph, paths and cycles in a graph, graphical representation, Hamiltonian: paths and circuit, graphs and circuit, isomorphism, connectivity-Algebraic system: Abelian group, order of a group, semi-group, important theorems on groups, subgroups, isomorphism

Reference Books :

1. Discrete Mathematics, Subhash G Deo, Neeraj Publications
2. Discrete Mathematics, John Dossey, Albert Otto, Lawrence Spence, Charles Vanden Eynden
3. Discrete Mathematics, Richard Johnsonbaugh

4.2 VISUAL C++

UNIT - I

VISUAL C++: Introduction to Visual C++, Getting started with Visual C++, Reading Keystrokes from the Keyboard

UNIT - II

Handling mouse in VC++, Creating Menus, Toolbar Buttons, Status Bar Prompts, Dialog Boxes: Using Buttons and Text Boxes, Creating Check boxes and Radio Buttons, LIST Boxes, Combo Boxes and Sliders

UNIT - III

File Handling, Multiple Documents and Multiple Views, Creating Internet programs - including a web browser, Creating ActiveX controls

UNIT - IV

VC++: ACTIVEX AND COM: Introduction to ActiveX, Building and using ActiveX controls in VC++, Introduction to COM, Building and using COM servers in VC++, Building Internet COM components with VC++

UNIT - V

COM security and features of Windows 2000, Debugging and profiling COM components, Deploying COM applications

Reference Books:

1. Microsoft Visual C++ Windows Applications by Example: Code and explanation for real-world MFC C++ Applications, Stefan Björnander
2. Microsoft Visual C++ Windows Applications by Example, Christian Wenz
3. Visual C++ Programming, Yashavant Kanetkar

4.3 WEB PROGRAMMING

Unit I:

Introduction to Computers and the Internet: History of the world wide web – Hardware Trends – the key software Trend: Object Technology – Java Script: Object based Scripting for the web – Browser protability – Hyper Text Markup Language: Introduction – Markup Languages – Editing HTML – common tags – Headers- Text Styling – Linking – Images – Formatting text with - Special Characters, Horizontal rules and more line breaks – Intermediate HTML: Introduction – unordered lists – nested and ordered lists – basic html forms – more complex html forms – internal linking-creating and using image maps <meta> tags -<frameset> tags.

Unit II:

Java Script: Introduction – Memory concepts – Arithmetic – Decision Making: equality and Relational Operators – Selection structures: if, if else, switch – Repetition structures: while, for , do/while – Break and continue statements – Labeled Break and continue statements – Logical operators – Functions: Introduction – Program Modules in Java Script – Programmer – Defined functions – Function definitions – Duration of Identifiers – scope rules – Recursion – Recursion Vs iteration – Java Script Global functions.

Unit III:

Arrays: Introduction – Arrays – Declaring and Allocation Arrays – References and Reference parameters – passing Arrays to Functions – Sorting Arrays – Searching Arrays – Multiple Subscripted Arrays – Objects: Introduction – Math, String, Data, Boolean and Number Objects – Dynamic HTML: cascading Style sheets: Introduction – Inline styles – Creating style sheets with the STYLE element – conflicting styles – linking external style sheets – positioning elements – backgrounds – element dimensions – text flow and the box model – user style sheets.

Unit IV:

Object Model and Collections: Introduction – Object Referencing – Collections all the children – Dynamic styles – dynamic positioning – using the frames collection – navigator object – event model: introduction – Event ONCLICK, Event ONLOAD-Error Handling with ONERROR – Tracking the Mouse with Event ONMOUSEMOVE – Rollovers with ONMOUSEOVER and ONMOUSEOUT – form processing with ONFOCUS and ONBLUR – more form processing with ONSUBMIT and ONRESET – event bubbling – Filters and Transitions: Introduction: Flip filters: flipv and fliph – Transparency with the chrom Filter – Miscellaneous Image Filters : invert, gray and x-ray- Adding shadows to Text – creating Gradients with alpha – Making Text Glow –Creating Motion with blur- Using the wave filter – advanced Filters: drop shadow and light – Transitions Filter – Filter blendTrans-Filter revealTrans-Client side Scripting with VBScript: Introduction – Operators – Datatypes and control structures – VBScript Functions – Arrays – String Manipulation Classes and Objects.

Unit V:

Active Server pages: Introduction – work – client side scripting versus server side scripting – using Personal web server or Internet Information server – server side activeX components – File system objects – Session tracking and cookies – Accessing a database from an ASP – CGI and Perl : Common Gateway Interface – Introduction to PERL – configuring personal web server for PERL/CGI – string processing and regular expressions – viewing clien/server environment variables – form processing and business logic – server side includes – verifying a user name and password – sending e-mail from a web browser – using ODBC to connect to a database – Cookies and perl – Extensible Markup Language: introduction – structuring data – document type definitions – customized markup languages – XML parsers – XHTML.

Reference Books:

1. Thomas A.Powell, "The complete Reference HTML and XHTML", Fourth Edition, Tata McGraw Hill Pub, Company Ltd., 2000.
2. Achyut S. Godbole, Atul Kahate, "Web Technologies – TCP/IP to internet Application Architectures", TMH Pub. Company Ltd, 2003.
3. H.M. Deitel, P.J.Deitel and T.R.Nieto, "Internet and World Wide web – How to Program ", Pearson Education Asia, 2003.

4.4 COMPUTER GRAPHICS

UNIT - I

Introduction to Computer Graphics, Development of Computer Graphics, Basic Graphics System and Standards, Continual Refresh and Storage Displays, Random Scan and Raster Scan Graphics, Color CRT Monitors, Display Processors and Character Generators

UNIT - II

Scan Conversion: Introduction, Scan Conversion of a Point, Scan Conversion of a Line, Scan Conversion of Circle, Polygon Filling, Conic Section Generation, Antialiasing

UNIT - III

2-D Graphics: Introduction, Two-dimensional Viewing, Basic Transformations, Interactive Graphics: Interactive Graphics Devices, Interactive Picture Construction Techniques

UNIT - IV

3-D Graphics-I: Three Dimensional Concepts, 3-D Representation, 3-D Transformations, 3-D Viewing

UNIT - V

3-D Graphics-II: 3-D Volumes Spline Curve and Surfaces, Fractals Quad tree and Octree Data Structures, Hidden Surfaces and Surface Rendering, Animation

Reference Books:

1. William M. Newman, Robert F. Sproul, "Principles of Interactive computer Graphics", Tata McGraw-Hill, Singapore, 2002.
2. Steven Harrington, "Computer Graphics- A Programming Approach" McGraw-Hill Book Company, 1988.
3. Foley James D., Vandam Andries and Huges John F., "Computer Graphics: Principles and Practices", Pearson Education.
4. Roy. A. Plastock and Gordon Kalley, "Theory and Problems of Computer Graphics", Schaum's Outline Series, McGraw Hill, 2000.

4.5 OBJECT ORIENTED ANALYSIS AND DESIGN

UNIT 1

Structured approach vs. object oriented approach: Introduction-Objectives-What is software?- High-Quality software -Where does the -traditional approach fail?- Pitfalls of top down design- How object method succeeds?-Merits of object approach-Summary

The Object Model : Objectives-Foundations of the object Model - Definitions: OOA , OOD and OOP-Major elements of Object Model- Abstraction- Encapsulation- Modularity-Hierarchy-Minor elements of the object model- Typing-Concurrency- Persistence-Summary

UNIT 2

Classes and Objects :Introduction-Object- Definition- Relationships among objects- Class- Definition- Relationships among Classes-Summary

Road Map for OOA and OOD : Objectives- Various Activities in a Design-OOA Phase- Creating Classes- Assigning Responsibilities- CRC Modeling- OOA Checkpoint- OOD Phase- OOD Checkpoint-Software problems- Best practices of software engineering

UNIT 3

Unified Modeling Language :Objectives-Introduction -UML and brief background -Architecture of UML- Why is UML powerful?- What is a process?- Phases and Iterations-Steps in UML-Modeling and UML-Goals of UML-Outside The Scope Of UML-A overview of UML- Views- Modeling elements - Relationships-UML diagrams-Extensibility mechanisms

UML Modeling elements : Introduction -Objectives-Class- Attribute -Attribute -Compartment- Attribute Scope- Derived Element-Operation-Object-Interface-Packages

UNIT 4

Diagrams in UML : Introduction-Objectives -Use Case model-Static view diagram- Class diagram- Object diagram-Dynamic view diagram- Statechart diagram- Interaction diagram- Sequence diagram- Collaboration diagram-Implementation diagram- Component diagram- Deployment diagram-Summary of Diagrams in UML

UNIT 5

Relationships connect modeling elements: Introduction - Objectives -Relationships -Notations- Association-Association End - Aggregation-Composition-Generalization-Dependency - Realization - Relationship between Objects

Extensibility Mechanisms: Introduction-Objectives -Constraint and Comment-Tagged values- Stereotypes-Summary

Reference Books:

1. Object-Oriented Analysis and Design, John Deacon
2. Object Oriented Analysis and Design with Applications, Grady Booch, Robert A. Maksimchuk, Michael W. Engel,
3. Bobbi J. Young Ph.D., Jim Conallen, Kelli A. Houston, Addison Wesley
Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and the Unified Process, Craig Larman

4.6 UNIX AND LINUX

UNIT – I UNIX

UNIX: A sample login session, logging on, using the on-line man pages, using man and more, logging off, directory and file structure, file names, directories, the df program, your login directory, subdirectories, specifying files, protecting files and directories

UNIT – II

The unix shell syntax, creating files, text editors, files as output and log files, the system and dealing with multiple users, addressing remote nodes, shortcuts, wildcards, environment variables, job control

UNIT – III

LINUX: Introduction – Linux, Operating System, History of Unix, Structure and Features of Linux, File system, **Shell:** Bash, Echo commands, Redirection, Screen Editor-vi, Filters, File related commands, Variable, Positional Parameters, Command substitution, Conditional execution

UNIT – IV

XWindows: Introduction, XWindows, Window Management, Starting X, A Window, Managing your files, Graphics, Templates to access applications and devices, Configuring your desktop, Session Management, Mime types

UNIT – V

Processes and Shell scripts 93-128: Process, Shell Scripts, Scripts, Command Line arguments – Arguments to a shell script, Programming Structures, Test Command or [], if statement, if elif, Case statement, Control transfer with break, Background processing

Reference Books:

1. NIIT, " Operating System – Linux ", PHI, 2003.
2. Grant Taylor, " Linux Compute ", BPB, 2000.
3. The UNIX Operating System - Kaare Christian & Susan Richter - John Wiley & Sons

4.7 Visual C++ Lab

1. Console Based Application
2. Case Conversion Using Edit Control
3. Programs Using Common Dialog Controls and Dialog Boxes
- 4 Creating Simple ActiveX Control
5. Simple Database Application
6. Graphics and Animation

4.8 WEB PROGRAMMING LAB

1. Simple Web page for a College
2. Simple Web Page for a Department
3. Simple Web page for Company
 - a. Using Java Script
 - b. Using DHTML
 - c. Using ASP
4. Using PERL and XML

5.1 WIRELESS APPLICATION PROTOCOL

Unit I:

Introduction – Market Convergence – Enabling convergence – key services for the mobile Internet – Business Opportunities. Making the Internet “Mobile”: Challenges and Pitfalls – The Origins of WAP – WAP Architecture – components of the WAP standard – Network Infrastructure services Supporting WAP clients – WAP architecture Design principles – Relationship to other standards.

Unit II

The wireless Markup language: Overview – The WML Document Model – WML Authoring – URLs Identify Content – Markup Basics – WML Basics – Basic Content – Events, Tasks and Bindings – Variables – Controls – Miscellaneous Markup – Sending Information – Application Security – Document Type Declaration – Errors and Browser Limitations.

Unit III

Web site Design: Computer Terminals versus Mobile Terminals – Designing a usable WAP site – Structured Usability Methods- User interface Design Guidelines – Design Guidelines for selected WML elements.

Unit IV

Tailoring content to the client – Push Messaging: overview of WAP Push – Push Access Protocol – WAP Push Addressing – Push Message – MIME media types for Push Messages – Push Proxy Gateway – Push over – the Air protocol – Push Initiator Authentication and Trusted Content.

Unit V

Wireless Telephony Applications: Overview of the WTA Architecture – The WTA Client Framework- The WTA server and security – Design Considerations – Application creation Tool box – Future WTA Enhancements – Mapping the Deployment Chain to the Business value chain – Security domains – Linking WAP and the Internet - WAP service Design – The Mobile Internet Future.

Reference Books:

1. Sandeep Singhal , Thomas Bridgman, Lalitha Suryanarayana and Others, “The Wireless Application Protocol”, Pearson Education.
2. CharlessArehare , Nirmal Chidambaram and others , “Professional WAP”, Wrox press Ltd ., Shroff pub . And Dist – Pvt. Ltd., 2001.

5.2 ADVANCED JAVA PROGRAMMING

UNIT – I

Java Utilities: Collections – I/O Streams – Networking – Event Handling.

UNIT – II

AWT: Windows, Controls, Layout Managers and Menus – Swing. Multimedia: Images, Animation and Audio - JDBC.

UNIT – III

Java Servlets: Design – Life Cycle – Constituents of javax. servlet package – cookies – session tracking – Java Server Pages: Overview – Implicit Objects – Scripting – Standard actions – Directives.

UNIT – IV

Remote Method Invocation: Remote Interface – The Naming Class – RMI security Manager Class – RMI Exceptions – Creating RMI Client and Server Classes – RMI – IIOP.

UNIT – V

Java Beans: Events – Customization – Introspection – Persistence – EJB: Introduction – EJB Container – Classes – Interfaces – Deployment Description – Session Bean – Entity Java Bean – Jar File.

Reference Books:

1. Herbert Schildt, "The Complete Reference – JAVA 2 ", Fourth Edition, 2001
2. Muthu, "Programming with Java", Vijay Nicole Imprints Private Ltd., 2004
3. Deitel H.M. & Deital P.J, "Java How To Program", Prentice-Hall of India, Fifth Edition, 2003.
4. Cay.S. Horstmann, Gary Cornel, "Core Java 2 – Vol. II- Advanced Features", Pearson Education, 2004.

5.3 INFORMATION SECURITY

UNIT - I

Information Systems in Global Context: History of Information Systems, Importance of Information Systems, Basics of Information Systems, The Changing Nature of Information Systems, Globalization of Business and the Need for Distributed Information Systems, Global Information Systems: Role of Internet and Webs Services, Information Systems Security and Threats: A Glimpse

UNIT - II

Threats to Information Systems: Introduction, New Technologies Open Door to the Threats, Information-Level Threats versus Network-Level Threats, Information Systems Security: Threats and Attacks, Computer Viruses: The *bête noire* of Computing Era, Classifications of Threats and Assessing Damages, Protecting Information Systems Security

UNIT - III

Security Considerations in Mobile and Wireless Computing: Proliferation of Mobile and Wireless Devices, Credit Cards Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Setting for Mobile Devices, Authentication Service Security, Mobile Devices: Security Implications for Organizations, Organizational Security Policies and Measures in Mobile Computing Era, Laptops, Use of RFID in Mobile Commerce and Information Asset Protection

UNIT - IV

Information Security Management in Organizations: The Context for Informative Security Management (ISM), Security Policy, Standards, Guidelines and Procedures, Information Security Scenario in the Financial Sector, Information Security Management System (ISMS), Organizational Responsibility for Information Security Management, Information Security Awareness Scenario in Indian Organizations

UNIT - V

Building Blocks of Information Security: Basic Principles of Information Systems Security, The Three Pillars of Information Security, Information Classification, Information Classification, Data Obfuscation, Business Systems' Classification, Event Classification, Information Security Risk Analysis: Introduction, Terms and Definitions for Risk Analysis of Information Security, Risk Management and Risk Analysis, Auditing Perspective on Information Security Risk Analysis

Reference Books:

1. Information Systems Security, Nina Godbole
2. Principles and Practices of Information Security, Michael E Whitm

5.4 .Net Programming

UNIT - I

NET Framework: Languages And The .NET Framework, The Structure Of A .NET Application, The .NET Base Class Library, Using Classes And Structures, Scope And Access Levels, Object-Oriented Programming: Basic Concept Of Object-Oriented Programming, Objects, Members, And Abstraction, Creating the User Interface: Composition, Adding Forms To Your Project, Using Forms, Using The Main Menu, The Integrated Development Environment: The Studio Windows, Studio Windows: The Server Explorer

UNIT - II

Types and Members: Introduction, Objectives, The .NET Data Types, Using Data Type Functionality, Operators, Type Of Operators , Using Constants, Enums, Arrays, and Collections, Flow-Control Statements: If ...Then, Else End If, For ...Next, Select Case End Select, Which... End Select, Do...Loop, Do Which... Loop, Do Until... Loop

UNIT - III

Functions: System define functions, String, Number, Date, User define functions, Using Controls and Components: Working with Controls, Add a control to your application, Edit Control, Setting the Control Tab Order, Interacting with the Mouse
Validating User Input: Field-Level Validation , Using Events in Field-Level Validation , Validating Characters, Handling the Focus

UNIT - IV

Menus: Creating Menus During Design, Shortcut Keys, Using Menu Item Events , Creating Context Menus, Displaying Check Marks on Menu Items, Displaying Radio Buttons on Menu Items, Cloning Menus, Merging Menus at Run Time, Adding Menu Items at Run Time, Interfaces and Exception handling, Advance .net Component, COM, Accessing a Web Service

UNIT - V

Overview of ADO .NET, Data Base, Introduction of Ado.net, Overview of Structured Query Language: Select, Insert, Update, Delete, Accessing Data: Connecting to database

Reference Books:

1. PRO ADO. NET WITH VB.NET 1.1, SAHIL MALIK / PAUL DICKINSON / FABIO CLAUDIO
2. .Net Framework Essentials (3RD 03), Thuan L. Thai and Hoang Lam
3. .NET Developer's Guide to Directory Services Programming (06), Joe Kaplan and Ryan Dunn

5.5 DATA MINING AND DATA WAREHOUSING

UNIT-I

Distributed Computing System, Evolution of Distributed Computing System, Distributed Computing System Models, Uses of Distributed Computed System, Introduction to Distributed Computing Environment-Introduction to Data Warehouse Concepts, Characteristics Of Data warehouse, Benefits Of Data warehouse.

UNIT-II

Comparison Between A Database System And Data warehouse System, Environment Of A Data warehouse, The Concepts Used In Developing The Warehouse, Data Modeling, Data Models, Olap, Characteristics Of Olap, Olap Tools, Relational Olap, Oltp, Managed Query Environment-Strategy For A Data Warehouse, Design Of A Warehouse, Issues Related With Development Of Data warehouse, Metadata, The Process Of A Data Warehouse Design, Considerations Of Technology-Fact Table, Dimension Table, Granularity Or Grain Of Fact Table, Star Schema, Snow Flake Schema, Complexity Of Transformation And Integration.

UNIT-III

Providing Data Access To The Enterprise, Operational Vs. Informational Systems, A Data Warehouse Architecture, Designing Data Warehouses,. Managing Data Warehouses, Data warehouse Team-Case Study

UNIT-IV

Data Warehousing-Characteristics and Benefits of Data warehousing, Classification of Data. Learning-Introduction, What is learning, Features and characteristics of educational software, A conceptual framework for the integration of learning technology
An Overview of Data Mining Techniques: Introduction, Classical Techniques: Statistics, Neighborhoods and Clustering, What is different between statistics and data mining?

UNIT-V

Next Generation Techniques: Trees, Networks and Rules, The Next Generation, Decision Trees, Viewing decision trees as segmentation with a purpose, where can decision trees be used? Rule Induction, Discovery
Data Mining and Customer Relationships, Relevance to a Business Process-Data Mining and Customer Relationship Management, Evaluating the Benefits of a Data Mining Model-From Data Mining to Database Marketing: Introduction, Data Mining vs. Database Marketing, What exactly is Data Mining? Who is developing the Technology? Conclusion
Knowledge discovery process: Introduction, The knowledge discovery process in details, Data selection, Data Cleaning, Data Mining, OLAP Tools, Decision Table, Neural Network, Genetic Algorithm

Reference Books:

1. Arun K.Puzari, "Data mining concepts and Techniques", India pot. Ltd, 2003.
2. Jiawei Han and Micheline kanber, Harcourt, C.S.R. Prabhu, "Data warehousing – Concepts, Techniques, products and Applications", PHI, 2002.
3. Hand, Mannila and Smyth, "Principles of Data Mining", PHI, New Delhi, 2004.
4. K.P.Soman, Shyam Diwakar, V.Ajay, "Insight into Data Mining Theory and Practice", PHI, New Delhi ,2006.
5. C.S.R Prabhu, "Data Warehousing Concepts, Techniques, Products and Applications", PHI, Second Edition.

5.6 SOFTWARE TESTING AND QUALITY MANAGEMENT

Unit 1

Software Testing and Software Testing Techniques

Introduction_Verification and Validation_Software Testing And Its Relation With -Software Lifecycle_Significance and Potential of Software Testing_Principles of Software Testing_Software Testability And Its Characteristics_Stages in Software -Testing Process_Types of Software Testing_Black-box Testing (BBT)_BBT Techniques_White-box Testing (WBT)_WBT Techniques

Unit 2

Software Testing Techniques and Object-Oriented Testing

Introduction_ Static Analysis_Dynamic Analysis_Software Test Design_Software -Testing Strategies_Defect Testing_Interface Testing_Alpha and Beta Testing_Object Oriented Testing Methods_Real-Time Systems Testing_Automated Software Testing Tools_Debugging_Debugging Techniques

Unit 3

Software Quality and Quality Assurance

Introduction-software quality definition-software quality factors-factors affecting software quality-software quality assurance (sqa)-sqa objectives-sqa goals-sqa activities-sqa plan-software reviews-formal technical reviews (ftrs)-code reviews and walkthroughs-metrics for rating the software quality factors-software quality metrics-technical metrics for software

Unit 4

Software Quality System and Models

Introduction_Software Quality System and Quality Management Principles_International Standards And Their Importance_Overview of ISO Standards_ISO 9000 Quality Standard_Elements of the ISO 9000 Standard_Applicability of ISO 9000 Standard_Implementation Success Factors of ISO 9000_ISO 9000 Quality System -Certification_SEI Capability Maturity Models_CMM Evaluation Assessment_CMM Vs ISO

Unit 5

Software Reliability, Safety and Hazard Analysis

Introduction-Software Reliability Definitions-Software Reliability Vs Hardware -Reliability-Factors Influencing Software Reliability-Basic Concepts of Faults, Failures, Time and Failure Functions-Software Failure Classification-Characteristics of Fault-Free Software-Dependable Systems-Benefits of Software Reliability-Limitations of -Software Reliability-Hazard Definitions-Concept of Software Safety-Significance of Software Safety-Safety Critical System-Hazard Analysis-Software Hazard Analysis-Hazard Analysis Techniques

Reference Books:

1. Software Testing, Ron Patton
2. Foundations of Software Testing, Aditya P Mathur
3. Software Testing, Dinesh Maidasani
4. Software Testing – Software Verification Software Validation, Rajiv Chopra

***** 5.8. PROJECT AND VIVA *****