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Academic Council
held on 26.03.2018

APPENDIX - BX

MADURAI KAMARAJ UNIVERSITY

(University with Potential for Excellence)

Bachelor of Computer Applications (B.C.A)

Revised Syllabus

(CBCS – Semester Pattern)

(With effect from the Academic Year 2018 onwards)

STRUCTURE OF THE SYLLABUS

1. **Introduction of the Programme:**

Bachelor in Computer Applications (BCA) is a three year undergraduate degree course which is divided into six semesters. Students will be taught subjects which are related to the technological applications that are required in today's practical work field. Students who opt for a Bachelor in Computer Applications (BCA) will get skills and information not only about Computer and Information Technology but also in communication, organization and management. One also get to learn programming languages such as Java, C++, HML, SQL, etc. Information about various computer applications and latest developments in IT and communication systems is also provided. It can land one either with a job or a startup business that we always wished or had an eye on.

2. **Eligibility for Admission:**

A Candidate should have studied +2 Mathematics, with Physics/Commerce/ Economics in the 10 +2 stream.

Duration of the Programme	:	3 Years
Medium of instruction	:	English

3. **Objective of the programme:**

- Understand the fundamental concepts of Computers and IT Applications.
- Learn technologies and computer languages, so the problems could be addressed.
- Successfully understand and analyze data to come out technological solutions.

- To identify and sharpen their IT/ programming skills.
- Develop competent technical skills and ideas to communicate public.

4.Outcome of the Programme:

- BCA graduates will have
- The necessary technical, scientific as well as basic managerial and financial procedures to analyze and solve real world problems within their work domain
- Clarity on both conceptual and application oriented skills in Computers, Accounting and IT Applications.
- Awareness on ethics, values, sustainability and creativity aspects.
- The ability and the mindset to continuously update and innovate.

5 Core subject papers:

The B.C.A programme consists of the following categories of the courses suggested for B.C.A Computer Application programme

Part – I	: 4
Part – II	: 4
Core Subjects (CS)	: 16
Allied Subjects (AS)	: 4
Elective Subjects (ES)	: 2
Skill based Subjets (SBS)	: 6
Non-Major Elective Subjects (NME)	: 2
Value Education (VE)	: 1
Environmental Studies (EVS)	: 1

6 Subject Elective Papers:

The University shall provide all information related to the Elective Subject in B.C.A to all the students so as to enable them to choose their Elective Subjects in each semester. The list of elect'ye Papers in each semester is displayed under the Programme structure.

7 Non–Major Elective Papers:

The list of Non-Major Elective Subjects in first and second semester is displayed under the Programme structure.

8 Unitization:

Each subject contains five units which are interrelated each other. Not only core subjects, but elective and non-major elective also contain the same.

9 Pattern of semester exam:

See Appendix - CA2

10 Scheme for Internal Assessment:

See Appendix - CA2

11 External Exam:

See Appendix - CA2

- There shall be external examinations at the end of each semester, odd semesters in the month of October / November and even semesters in April / May.
- A candidate, who has not passed the examination, may be permitted to appear in such failed subjects in the subsequent examinations to be held in October / November or April / May. A candidate should get registered for the first semester examination. If registration is not possible, owing to shortage of attendance beyond condonation limit / regulation prescribed OR belated joining OR on medical grounds, the candidates are permitted to move to the nextsemester. Such candidates shall re-do the missed semester after the completion of the programme.
- Students must have earned 75% of attendance in each course for appearing for the examination. Students who have earned 74% to 70% of attendance have to apply for condonation in the prescribed form with the prescribed fee. Students who have earned 69% to 60% of attendance have to apply for condonation in the prescribed form with the prescribed fee alongwith the Medical Certificate.
- Students who have below 60% of attendance are not eligible to appear for the examination. They shall re-do the semester(s) after the completion of the programme.

The results of all the examinations will be published through the controller of examination where the students underwent the course as well as through University Website. In the case of private candidates, the results will be published through the Controller of examination in which they took the examinations as well as University Website.

12 Question Paper Pattern:

See Appendix - PCA2

13 Scheme of Evaluation:

The performance of a student in each course is evaluated in terms of percentage of marks with a provision of conversion to grade points. Evaluation of each course shall be done by a continuous internal assessment by the concerned Course Teacher as well as by an end semester examination and both will be consolidated at the end of the course.

A mark statement with $\mathbf{CCPA} = \frac{\sum(\text{Marks} \times \text{Credits})}{\sum(\text{Credits})}$ where the summations cover all the papers appeared up to the current semester.

14 Passing Minimum:

A candidate passes the B.C.A., by scoring a minimum of 40% (internal + external) in each paper of the course. No minimum marks for internal assessment. External minimum for external assessment is 35% i.e., 27 out of 75.

14.1 Classification:

S. No	Range of CCPA	Class
1	50 & above but below 60	II
2	60 & Above	I

15. Model Questions:

One Model question paper is displayed at the end of the regulation

16. Teaching Methodology:

Each subject is designed with lectures/ tutorials/ seminar/ Peer-Team-Teaching / PPT presentation/ assignments etc., to meet the effective teaching and the learning requirements. 10 % of the course content must be taught through peer team teaching methodology.

17. Text Books:

List of all the text books is quoted at the end of the syllabus of each subject

18. Reference Books:

The list of reference books is followed by the list of text books. This list contains at least two books minimum for each subject.

19. Retotaling and Revaluation Provision

Candidates may apply for retotaling and revaluation within ten days from the date of the result published in the university website along with the required forms and fees.

20. Transitory provision:

The candidates of previous scheme may be permitted to write exams in their own schemes up to the examinations of April 2020 as a transitory provision.

21.Subjects and Paper related web sites:

All the subject details along with syllabus may be downloaded from the university website **www.mkuniversity.org**

Subject/Structure of Course Study

Sem.	Subjects							Total Hours	Total Credits
I	T1(6) [3]	E1(6) [3]	CS1(4) [4]	CS2(6) [4]	AS1(4) [4]	SBS1(2) [2]	NME1(2) [2]	30	22
II	T2(6) [3]	E2(6) [3]	CS3(4) [4]	CS4(6) [4]	AS2(4) [4]	SBS2(2) [2]	NME1(2) [2]	30	22
III	T3(6) [3]	E3(6) [3]	CS5(4) [4]	CS6(4) [4]	CS7(4) [4]	AS3(4) [4]	SBS3(2) [2]	30	23
IV	T4(6) [3]	E4(6) [3]	CS8(4) [4]	CS9(4) [4]	CS10(4) [4]	AS4(4) [4]	SBS4(2) [2]	30	23
V	CS11(5) [4]	CS12(5) [4]	CS13(5) [4]	CS14(6) [4]	ES1(5) [4]	EVS(2) [2]	SBS5(2) [2]	30	24
VI	CS15(5) [4]	CS16(6) [4]	CS17(5) [4]	ES2(5) [4]	ES3(5) [5]	VE(2) [2]	SBS6(2) [2]	30	25
							Extension Activity		1
							Total Credits		**140**

Abbreviations:

( )	–	Number of Hours	[ ]	–	Number of Credits
T	-	Tamil;	E	-	English
CS	-	Core Subject	AS	-	Allied Subject
SBS	-	Skill Based Subject	NME	-	Non Major Elective
ES	-	Elective Subject	VE	-	Value Education
EVS	-	Environmental Studies	EA	-	Extension Activity

I SEMESTER

S No	Code	Subject	Hours	Credits	Internal Marks	External Marks
1	T1	Tamil	6	3	25	75
2	E1	English	6	3	25	75
3	CS1	Fundamentals of Computer and C Programming	4	4	25	75
4	CS2	**Lab 1** : Programming in C	6	4	40	60
5	AS1	Discrete Mathematics	4	4	25	75
6	SBS1	**Lab 2 :** Office Automation Lab	2	2	40	60
7	NME1	Computer Fundamentals	2	2	25	75
		Total	30	22		

II SEMESTER

S No	Code	Subject	Hours	Credits	Internal Marks	External Marks
1	T2	Tamil	6	3	25	75
2	E2	English	6	3	25	75
3	CS3	Object Oriented Programming with C++	4	4	25	75
4	CS4	**Lab 3:**Problem solving using C++	6	4	40	60
5	AS2	Computer based Financial accounting	4	4	25	75
6	SBS2	**Lab 4** : Business accounting	2	2	40	60
7	NME2	Internet applications	2	2	25	75
		Total	30	22		

III SEMESTER

S No	Code	Subject	Hours	Credits	Internal Marks	External Marks
1	T3	Tamil	6	3	25	75
2	E3	English	6	3	25	75
3	CS5	Java Programming	4	4	25	75
4	CS6	**Lab 5:** Java Programming	4	3	40	60
5	CS7	Digital Principles and Computer organization	4	4	25	75
6	AS3	E - Commerce	4	4	25	75
7	SBS3	**Lab 6:**Script Programming (HTML/Javascript/VBscript)	2	2	40	60
		Total	30	23		

IV SEMESTER

S No	Code	Subject	Hours	Credits	Internal Marks	External Marks
1	T4	Tamil	6	3	25	75
2	E4	English	6	3	25	75
3	CS8	Data Structures and Computer Algorithms	4	4	25	75
4	CS9	**Lab 7:** Data Structures and Computer Algorithms	4	3	40	60
5	CS10	Operating Systems	4	4	25	75
6	AS4	Computer Graphics and Multimedia	4	4	25	75
7	SBS4	**Lab 8:**Linux Programming	2	2	40	60
		Total	30	23		

V SEMESTER BCA

S No	Code	Subject	Hours	Credits	Internal Marks	External Marks
1	CS11	Database Management Systems	5	4	25	75
2	CS12	Software Engineering	5	4	25	75
3	CS13	Dot Net Programming	5	4	25	75
4	CS14	**Lab 9** : Dot Net Programming(VB.Net)	6	4	40	60
5	ES1	1. Client / Server System 2. Soft Computing 3. Information Security	5	4	25	75
6	EVS	Environmental Studies NME1	2	2	25	75
7	SBS5	**Lab 10** :PHP and MySQL	2	2	40	60
Total			30	24		

VI SEMESTER

S No	Code	Subject	Hours	Credits	Internal Marks	External Marks
1	CS15	Computer Networks	5	4	25	75
2	CS16	Web Programming	6	4	40	60
3	CS 17	**Lab 11** : Web Programming	5	4	25	75
4	ES2	1. Data Mining 2. Mobile Computing 3. Software Testing and Quality Assurance	5	4	25	75
5	ES3	Project Work / Viva-Voce	5	5	25	75
6	VE	Value Education NME 2	2	2	25	75
7	SBS6	Mobile Application Development	2	2	25	75
Total			30	25		

Scheme of Examination / Question Paper Pattern

I - Theory Subjects:

(Total Marks: 100 (Internal: 25 Marks, External: 75 Marks)

Parameters	
Internal	**External**
i Average of two tests 10Marks ii. Assignment 10 Marks iii. Seminar / Group discussion5 Marks iv.Peer-Team-Teaching 5 Marks **Total: 25 Marks**	i. Part - A (10*1) 10 Marks ii.Part – B (5*7) 35 Marksiii.Part – C (3*10) 30 Marks **Total 75 Marks**

Note: Peer-Team- Teaching shall conducted by forming a groups according the strength of the class with representation of both slow learners and fast learners. At least 10 % of the syllabus may be allocated with proportional allocation of teaching hours and be evaluated.

External examination question pattern:

Time: 3 Hours **Max. Marks: 75**

Part – A

Answer all the questions ***(10*1=10)***

Ten Questions, two questions from every unit: *Multiple Choice questions.*

Part – B

Answer all the questions ***(5*7=35)***

Five Questions, one question set from every unit: *Either ...Or... type*

Part – C

Answer any three questions ***(3*10=30)***

Five Questions, one question from every unit

II - Practical Subjects:

(Total Marks: 100 (Internal: 40 marks, External: 60 Marks)

- A candidate has to prepare Algorithm / Procedure for both the questions covering both the parts.
- The following list of parameters taken into account for the evaluation of practical examination.

Parameters	
Internal Marks	**External Marks**
i. Average of two tests: 25 Marks	i. Aim, Procedure / Algorithm and Program: 15 Marks
ii. Record Work: 10 Marks	ii. Coding and Compilation: 10 Marks
iii. Seminar / Quiz / Viva: 5 Marks	iii. Debugging : 15 Marks
Total: 40Marks	iv. Results : 10 Marks
	v. Viva: 10 Marks
	Total 60 Marks

Note: The External Examiner can fix exercises also other than those found in the list *(Syllabus)* in consultation with the Internal Examiner without violating the scope of the prescribed syllabus.

III - Project Work:
(Total Marks: 100 (Internal: 25 marks, External: 75 Marks))

The following list of parameters taken into account for the evaluation of the Project work.

Parameters	
Internal Marks	**External Marks**
Review 1:7.5Marks	i. Project Report: 25 Marks
Review 2:7.5Marks	ii. Project demo & Presentation : 30 Marks
Overall Performance: 10 Marks	iii.Viva-Voce : 20 Marks
Total 25 Marks	**Total 75Marks**

The combined project shall be undertaken by the students as a team of two.

CS 1: Fundamentals of Computer and C Programming
(4 Hours – 4 Credits)

Unit I:

Overview of C: History of C – Importance of C – Basic Structure of C Programs – Programming Style – Character Set – C Tokens – Keywords and Identifiers – Constants, Variables and Data Types – Declaration of Variables – Defining Symbolic Constants – Declaring a variable as a constant – overflow and underflow of data – Operators and Expressions: Arithmetic, relational, logical, assignment operators – increment and decrement operators, conditional operators, bitwise operators, special operators – Arithmetic Expressions- Evaluation of Expressions – Precedence of Arithmetic Operators – Type Conversions in Expressions – Operator Precedence and Associativity.

Unit II:

Managing I/O Operations: Reading and Writing a Character – Formatted Input, Output – Decision Making & Branching: if statement - if else statement - nesting of if else statements - else if ladder – switch statement – the ?: operator – goto statement – the while statement – do statement – the for statement – jumps in loops.

Unit III:

Arrays: One-Dimensional Arrays – Declaration, Initialization – Two-Dimensional Arrays – Multi-dimensional Arrays – Dynamic Arrays – Initialization. Strings: Declaration, Initialization of string variables – reading and writing strings – string handling functions.

Unit IV:

User-defined functions: need – multi-function programs – elements of user defined functions – definition – return values and their types – function calls, declaration, category – all types of arguments and return values – nesting of functions – recursion – passing arrays, strings to functions – scope visibility and life time of variables. Structures and Unions: Defining a structure – declaring a structure variable – accessing structure members – initialization – copying and comparing – operation on individual members – array of structures – arrays within structures – structures within structures – structures and functions – unions – size of structures – bit fields.

Unit V:

Pointers: Accessing the address of a variable – declaring, initialization of pointer variables – accessing a variable through its pointer – chain of pointers – pointer increments and scale factors – pointers and character strings – pointers as function arguments – pointers and structures. Files: Defining, opening, closing a file – IO Operations on files – Error handling during IO operations – command line arguments.

Text Book:

Programming in ANSI C, E.Balagurusamy, 7th Edition, McGraw Hill Education(India) Pvt. Ltd., 2017.

Unit I: Chapter 1, Chapter 2, Chapter 3
Unit II: Chapters 4, Chapter 5, Chapter 6
Unit III: Chapter 7, Chapter 8
Unit IV: Chapter 9, Chapter 10
Unit V: Chapter 11, Chapter 12

Reference Books:

1. B. Gottfried, "Schaum's Outline of Programming with C", 3rd Edition, Tata McGraw Hill,2010.
2. J.R. Hanly and E.B. Koffman, "Problem Solving and Program Design in C", 6th Edition, Pearson Education, 2009.
3. Programming with ANSI and Turbo C, Ashok N.Kamthane , Pearson Education, 2006
4. H. Schildt, C: The Complete Reference, 4th Edition, TMH Edition, 2000.
5. Kanetkar Y., Let us C, BPB Pub., New Delhi, 1999.

CS 2: Lab 1: Programming in C
(6 Hours – 4 Credits)
Section A

1. Write a program in C to find the maximum and minimum element in an array. (user input)
2. Write a program in C to print all unique elements in an array. (user input)
3. Write a Program in C to Check Whether a string is Palindrome or Not (without using default string functions)
4. Write a program in C to menu driven program for string manipulation using switch case
5. Write a program in C to Sum of digit
6. Write a program in C to check a given number Armstrong or not.
7. Write a program in C to print Pascal triangle upto n rows.
   Sample Input: 5
   Sample Output:
   1
   1 1
   1 2 1
   1 3 3 1
   1 4 6 4 1
8. Write a program in C to convert decimal number to binary number using the function
9. Write a program in C to search an element using linear search technique.
10. Write a program in C to add two Matrices and display matrix format with result
11. Write a program in C to print Fibonacci Series using recursion.
12. Write a program in C to implementation of Digital Clock
13. Write a program in C to count the number of vowels and consonants in a string using a pointer.
14. Write a program in C to create and store information in a text file
15. Write a program in C to extract individual bytes from an unsigned int using union

Section B

1. Write a program in C for multiplication of two matrices (User input: row, column, Matrix A, Matrix B)
2. Write a program in C to Finding the No. of characters, words and lines from a given text file
3. Write a program in C to copy a file in another name.
4. Write a program in C to Binary Search
5. Write a program in C to read and write information of an employee using structure
6. Write a Program in C to design Log In screen, check username and password using structure

AS 1: Discrete Mathematics
(4 Hours – 4 Credits)

Unit I:

Set Theory: Introduction – Sets – Notation and Description of Sets – Subsets – Venn – Euler Diagrams – Operation on sets – Properties of set operations – Verification of basic laws and algebra by Venn Diagram.

Unit II:

Relations and Functions: Relations – Representation of a relation – Operations on relations – equivalence relation – Closures &Warshalls Algorithm – Partial order Relation – Hasse Diagrams – Lattices.

Unit III:

Logic: Introduction – IF statements – Connectives – Truth table of a formula – Tautology – Tautological implications and Equivalence of formulae – Quantifiers.

Unit IV:

Recurrence relations and Generating functions: Recurrence relation – an introduction – Polynomial and their evaluations – Recurrence relations – Solutions of finite order homogeneous (linear) relations – Solutions of non-homogeneous relations – Generating functions (for all the theorem consider the statements without proofs).

Unit V:

Graph Theory: Basic concepts – Matrix representations of graphs – Trees – Spanning tree – shortest path problem.

Text Book:

Discrete Mathematics – M.Venkataraman, N.Sridharan and N.Chandrasekaran – The National Publishing Company, May 2009.

UNIT I : Chapter 1.1 to 1.8
UNIT II: Chapter 2 (2.2 to 2.6), 10.1
UNIT III: Chapter 9 (9.1 to 9.3, 9.6 to 9.8, 9.15)
UNIT IV: Chapter 5.1 to 5.6
UNIT V: Chapter 11.1 to 11.5

SBS 1: Lab 2: Office Automation Lab
(2 Hours – 2 Credits)

SECTION – A:

MS – WORD

1. Open a word document to prepare your Resume by performing the following operations.
   a) Formatting the Text – Alignment & Font style
   b) Page setup (margin alignment, page height & width)
2. Create a word document to prepare an application form (College)
3. Create a word document to prepare a student mark sheet.
4. Design an invitation using different fonts, font sizes, bullets and Word Art / Clip Art
5. Prepare an invitation and sent to specific addresses in the data sourceusing .Mail Merge Concept.

MS – EXCEL

6. Create a student mark sheet with necessary information and use Data sort to display results. Also use Data Filters to answer at least five different criteria.
7. Create a student mark sheet with necessary information and make out a suitable chart showing gridlines, legends and titles for axes.
8. Prepare a salary bill in a worksheet showing Basic Pay, DA, HRA, Gross salary, PF, Tax and Net salary using suitable Excel Function.

SECTION – B:

POWER POINT

9. Create a power point presentation to explain various aspects of your college using Auto play.
10. Create a power point presentation to explain various aspects of ABC company using Auto play.

MS ACCESS

11. Create a Student Database having Name, Regno, Tamil, English, Maths, Total, and Average. Find the total and average marksand check data entered.
12. Create an Inventory database having Item Name, Item no. Quantity and Price.- Perform query operations to retrieve data.
13. Create a form to enter the details of Book database.
14. Create report for the above database.

NME 1: Computer Fundamentals
(2 Hours – 2 Credits)

Objective:
This course introduces Computers and its Components, various types of memory and different types of software, operating systems and its jobs, Algorithms and Programming Languages as a base for writing high-level programs, Data bases and basic Networking concepts.

Unit I:

Introduction to Computers: Definition of a Computer - Characteristics, Generation and Classification of Computers - Basic Computer Organization - Applications. Input and Output Devices: Input devices - Output Devices - Soft Copy Devices - Hard Copy Devices.

Unit II:

Computer Memory and Processors: Introduction - Memory Hierarchy - Processor Registers, Cache Memory - Primary Memory - Secondary Storage Devices - Magnetic tapes - Floppy Disks - Hard Disks - Optical Devices - USB Flash Drives - Memory Cards - Mass Storage Devices - Basic Processor Architecture.

Unit III:

Computer Software: Introduction to Computer Software - Classification of Computer Software - System Software - Application Software – Firmware - Middleware. Operating System: Introduction - Evaluation of Operating Systems - Process Management - Memory Management - File Management - Device management - Secondary Management - Command Interpreter - Popular Operating Systems.

Unit IV:

Introduction Algorithms and Programming Languages: Algorithms - Control Structures used in Algorithms - Flowcharts - Pseudocode - Programming languages - Generation of Programming Languages - Categories of High - Level Languages.

Unit V:

Database Systems: File-Oriented Approach - Database-oriented Approach - Database Views - Three-scheme Architecture - Database Models - Components of Database Management Systems - Retrieving Data Through Queries. Computer Networks: Introduction to Computer Networks - Connecting Media - Data Transmission Mode - Data Multiplexing - Data Switching - Data Routing Techniques - Network Topologies - Types of Network - Networking Devices - Open System Introduction Model.

Text Book:

Fundamentals of Computers ByReemaThareja, Oxford University Press, Forth Impression 2015.

Unit I : Chapters 1 and 2
Unit II : Chapter 3
Unit III : Chapters 6 and 7
Unit VI : Chapter 8
Unit V : Chapters 9 and 10

Reference Books:

Computer Fundamentals By Anita Goel, Pearon Education India ,2010.

CS 3: Object Oriented Programming with C++
(4 Hours – 4 Credits)

Objectives:

- To inculcate knowledge in object oriented programming concepts.
- To enrich the knowledge in inheritance and virtual functions.

Unit I:

Software Crisis – Software Evolution – Basic Concepts of Object-Oriented Programming – Benefits of OOP – Object-Oriented Languages - Applications of OOP – Application of C++ - Structure of a C++ Program – Tokens – Keywords – Identifiers – Basic Data Types – User-defined Data types – Derived data types – Symbolic constants – Type compatibility – Declaration of variables – Dynamic initialization of variables – Reference variables – Operators in C++ - Manipulators – Type cast operator – Expressions and their types-Implicit conversions – Control structures – The main function – Function prototyping – inline functions – Function overloading.

Unit II:

Specifying a class – Defining member functions – Making an outside function inline – Nesting of member functions – Private member functions – Array within a class – Memory allocation for objects – Static data members – Static member functions – Array of objects - Objects as function arguments – Friendly functions – Returning objects – Constant member functions – Constructors – Parameterized constructor – Multiple constructors in a class – Constructors with default arguments – Dynamic initialization of objects – Copy constructor – Destructors.

Unit III:

Defining operator overloading – Overloading unary operators – Overloading binary operators – Overloading binary operators using friend function – Rules for overloading operators - Defining derived classes – Single inheritance – Making a private member inheritable – Multilevel inheritance – Multiple inheritance – Hierarchical inheritance – Hybrid inheritance - Virtual base classes – Constructors in derived class – Member classes: Nesting of classes.

Unit IV:

Poin er ') objects – this pointer – Pointers to derived classes – Virtual functions – Pure virtual functions – C++ Stream classes – Unformatted I/O operations – Managing output with manipulators.

Unit V:

Classes of file stream operations – Opening and Closing files – Detecting end of file – More about open() function – File modes, File pointers and their manipulation – Sequential input and output operations – Command-line arguments- Templates: class templates and function templates.

Text Book:

Object Oriented Programming with C++, E. Balagurusamy, McGraw Hill Education (India) Private Limited, New Delhi, *Sixth Edition*-2013
Unit I : Chapter 1 (Except 1.3, 1.4), Chapter 2 (Only 2.6), Chapter 3 (Except 3.20, 3.21, 3.22) and Chapter 4
Unit II : Chapter 5 (Except 5.18, 5.19), Chapter 6 (Except 6.8, 6.9, 6.10)
Unit III: Chapter 7 and Chapter 8
Unit IV: Chapter 9 and Chapter 10
Unit V: Chapter 11 (Except 11.8) and Chapter 12 (Only 12.2, 12.3 and 12.4)

Reference Books:

1. C++ - The Complete Reference, Herbert Schildt, TMH, 1998.
2. C++ How to Program, Paul Deitel, Harvey Deitel, PHI, Ninth edition (2014).
3. Ashok N.Kamthane, Object Oriented Programming with ANSI & Turbo C ++, Pearson Education, 2006.
4. Object-Oriented Programming Using C++, Alok Kumar Jagadev, Amiya Kumar Rath and SatchidanandaDehuri, Prentice-Hall of India Private Limited, New Delhi, 2007.

CS 4: Lab 3: Problem Solving using C++
(6 Hours – 4 Credits)

Section- A

1. Generate prime numbers between the given two numbers.
2. Perform arithmetic operations using Inline function.
3. Accept a three digit number and display it in words.(Example 123 should be printed out as One Two Three)
4. Find the sum of given numbers using function with default arguments.
5. Swap two values using methods of passing arguments in function
6. Prepare a student Record using class and object.
7. Find the area of geometric shapes using function overloading.

8. Illustrate the concept of Friend function.
9. Demonstrate default constructor or no argument constructor.
10. Demonstrate parameterized constructor.
11. Demonstrate copy constructor.
12. Demonstrate constructor overloading.
13. Demonstrate destructors.
14. Demonstrate constructor using 'this' pointer.

Section- B

1. Demonstrate constructor with default arguments.
2. Program using manipulators.
3. Perform operator overloading for Unary minus, unary increment and unary decrement
4. Concatenate two strings using the concept of Binary operator overloading.
5. Perform addition and subtraction of complex numbers using Binary Overloading.
6. Create student mark sheet using single inheritance.
7. Prepare employee information using multiple inheritance.
8. Process employee details using hierarchical inheritance.
9. Implement the concept of Virtual functions.
10. Implement the concept of virtual base class.
11. Sort the given set of numbers using function templates
12. Search the key element in the given set of numbers using class template.
13. Processing mark list using binary file.
14. Count number of objects in a file.
15. Demonstrating the use of Command-line arguments.
16. Implement a file handling concept using sequential access.
17. Implement file handling concept using random access

AS 2: Computer based Financial Accounting
(4 Hours – 4 Credits)

Unit I:

Financial Accounting: Meaning, Nature and scope, Limitations – **Accounting Principles** : Basic Concepts and Conventions – Objectives of accounting – Accounting rules.

Unit II:

Books and records : Recording of business transactions – Types of accounts – Journal – Ledger – Journal Vs Ledger, Subsidiary books – Trial balance.

Unit III:

Final Accounts: Introduction – Trading account – Profit and loss account – Balance sheet. (Simple problems)

Unit IV:

Introduction to Tally: Features of Tally 9 – Company info: Create, Select, Alter and Close or Shut Company – Ledger Creation: Creating, Displaying, Altering and Deleting. F11 – Features and F12 – Configuration.

Unit V:

Voucher Creation: Receipt, Payment, Contra, Journal, Sales, Purchase, Memo, Display, Alter, Delete, Insert, Statement of Reports: Trail balance, Profit and Loss account, Balance sheet.

Text Books

1. Financial Accounts – R.S.N. Pillai and Bagavathi, S.Chand, 2007
   Unit I: Pg. Numbers – 1 to 22
   Unit II : Pg. Numbers – 30 – 65
   Unit III: Pg. Numbers – 154 to 170
2. Tallly (version 9) – C.NellaiKannan, 2007
   Unit IV : Pg. Numbers – 5 to 61
   Unit V : Pg. Numbers – 62 to 102

Reference Books

1. Comdex Tally 9 – Dr. NamrataAgrawal, Dream Tech Publications
2. Tally (Accounting Software) S.Palanivel, Margham Publications, 2010

SBS 2: Lab 4:Business Accounting
(2 Hours – 2 Credits)

I. Company Creation
II. Ledger Creation
III. Voucher Creation
   a) Contra voucher
   b) Payment voucher
   c) Receipt voucher
   d) Journal voucher
   e) Purchase voucher
   f) Sales counter
IV. Reports
   a) Day book
   b) Trail balance
   c) Final Accounts
   d) Purchase Register
   e) Sales Register
   f) Outstanding Receivable
   g) Outstanding Payable
   h) Cheque Printing
   i) Bank Reconciliation Statement

NME 2: Internet applications

(2 Hours – 2 Credits)

Unit I:

Introduction to internet: Internet- Growth of Internet and ARPANet-Owners of the Internet-Anatomy of Internet – History of WWW- Basic Internet Terminologies – Net etiquette- Internet Applications- Commerce on the Internet – Governance on the Internet-Impact of Internet on Society.**TCP/IPInternet Technology and Protocols:** Packet Switching Technology- Internet Protocols- TCP/IP – Router-Internet Addressing Scheme-Machine Addressing-E-mail Addresses – Resource Addresses.

Unit II:

Interconnectivity: Connectivity types-Setting up a connection-Hardware requirements-Selection of a modem- Software requirements – Internet accounts by ISP-ISDN-Protocol options-Service options.**Internet Network:** Network Definition-Common terminologies – Node- Host- Workstation-Network Administrator-Network security-Network Components –Servers-client Server- Communication Media- Types of Networks-Addressing in Internet – DNS- Network topologies – Ethernet – FDDI- ATM.

Unit III:

Browsers and Search engines: Browsers- What is a browser? – Parts of a browser window-Running a browser - working with a Browser.**Search engines**:What is search engine? - Types of search engines-Search and meta search engines.

Unit IV:

E-mail: E-mail-E-mail Networks and Servers-E-mail Protocols- Structure of E-mail-Attachments – E-mail Clients- E-mail Clients-web based E-mail-Address book – Signature File.

Unit V:

HTML Programming Basics: Introduction to HTML – HTML browsers-Different versions of HTML-HTML tags- Document overview-Header elements- Section headings-Block hedings- Lists-Inline elements – Images- working with Tables,Forms,Frames.

Text book:

Internet Technology and Web design, Ramesh Bangia, Firewall Media, (An imprint of Lakshmi Publications Pvt. Ltd.), Third Edition, 2011.

Chapters:

Unit 1: Chapter 1.2
Unit 2: Chapter 3 & Chapter 4
Unit 3: Chapter 5(5.6), Chapter 8(8.11 &8.13)
Unit 4: Chapter 5 (5.1)&Chapter 6
Unit 5: Chapter 9

Reference Books:

1. The Internet Book, Douglas E. Comer, Fourth Edition, PHI Learning Pvt. ltd. , New Delhi, 2009.
2. Using the Internet the Easy Way, Young Kai Seng, Minerva Publications, First Edition, 2000.
3. Fundamentals of Information Technology By Alexis Leon and Mathews Leon, Vikas Publishing House Pvt. Ltd., Revised Edition.

CS 5: Java Programming

(4 Hours – 4 Credits)

Objective:

- To inculcate knowledge in Java programming concepts.
- To provide knowledge in Package and Applet concepts.
- To enrich the knowledge in Multithread and Graphics concepts.

Unit I:

JavaEvolution: Java Features – How Java differs from C and C++ – Java and Internet – Java and World Wide Web – Web Browsers – Hardware and Software Requirements – Java Environment. **Overview of Java Language:** Simple Java Program – Java Program Structure – Java Tokens – Java Statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments. Constants – Variables – Data types – Declaration of Variables – Giving Values to variables – Scope of Variables – Symbolic Constants – Type Casting. **Operators and Expressions**: Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Operators – Operator Precedence and Associativity – Mathematical Functions. **Decision Making and Branching:** Decision Making with If statement – Simple If Statement – If else Statement – Nesting If Else Statement – the Elself Ladder – The switch Statement – The ?: operator. **Decision Making and Looping:** The while statement – The do statement – The for statement – Jumps in Loops.

Unit II:

Class, Objects and Methods: Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing class members – Constructors – Methods Overloading – Static Members – Nesting of Methods – Inheritance – Overriding Methods – Final Variables and Methods – Final Classes – Finalizer Methods – Abstract Methods and Classes – Visibility Control. Arrays, **Strings and Vectors:** One – dimensional Arrays – creating an Array – Two dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types. **Interfaces**: **Multiple Inheritance :** Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.

Unit III:

Packages: Java API Packages – Using system Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes – Static Import. **Multithreaded Programming:** Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority – Synchronization – Implementing the Runnable Interface.

Unit IV:

Managing Errors and Exceptions: Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing our own Exceptions – Using Exceptions for debugging. **Applet Programming:** How Applets differ from Applications – Preparing to write Applets – Building Applet Code – Applet Life Cycle – Creating an executable Applet – Designing a WebPage – Applet Tag – Adding Applet to HTML file – Running the Applet.

Unit V:

Graphics Programming: The Graphics Class – Lines and Rectangles – Circles and Ellipses, Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts. **Managing Input/Output Files in Java:** Concept of Streams – Stream Classes – Byte Stream Classes – Character Stream Classes – Using Streams – Other Useful I/O Classes – Using the file Class – I/O Exceptions – Creation of Files – Reading / Writing Characters – Reading / Writing Bytes – Handling Primitive Data Types – Concatenating and Buffering Files – Random Access Files – Interactive Input and Output.

Text Book:

Programming with Java, E.Balagurusamy, A primer, Tata McGraw Hill, Fourth Edition, 2008.

Chapters: Unit I : 1, 2, 3, 4, 5, 6, 7.
Unit II : 8, 9, 10.
Unit III: 11, 12.
Unit IV: 13, 14
Unit V:15, 16

Reference Books:

1. Object Oriented Programming Through JAVA- P.Radha Krishna, University Press, 2007.
2. Java and Object-Oriented Programming Paradigm, Debasish Jana, Prentice Hall of India Private Limited, New Delhi, 2008. Edition, July 2014 Reprint.
3. The Complete Reference, Java2, Herbert Schildt, Tata McGraw Hill, Fifth Edition, 2002.
4. Introduction to Java Programming ,K.Somasundaram, Jaico Publications, 2013.
5. Core Java - Vol. I – Fundamentals, Cay S. Horstmann, Pearson Education; Tenth edition, 2016.

CS 6: Lab 5: Java Programming
(4 Hours – 3 Credits)

Write Programs in Java for the following:

Section A

1. To implement a simple temperature conversion program.
2. To perform addition and subtraction of complex numbers using class and objects.
3. To perform volume calculation using method overloading.
4. Using command line arguments, test if the given string is palindrome or not.
5. String manipulation using String Methods (Use of any five String methods are preferred).
6. Write a program to fill names into a list .Also, copy them in reverse order into another list. If the name contains any numeric value throw an exception "Invalid Name"
7. Program to demonstrate the use of any two built-in exceptions in Java.

Section B

1. To perform multiplication of matrices using class and objects.
2. Using multilevel inheritance process student marks.
3. Implement multiple inheritance for payroll processing.
4. Implement interface for area calculation for different shapes.
5. Create a package called "Arithmetic" that contains methods to deal with all arithmetic operators. Also write a program to use the package.
6. Create two threads such that one of the thread generate Fibonacci series and another generate perfect numbers between two given limits.
7. Define an exception called **": Marks Out of bound:"** Exception, that is thrown if the entered marks are greater than 100.
8. Program to demonstrate the use of Wrapper class methods.
9. File Processing using Byte stream.
10. File Processing using Character Stream.
11. Write applets to draw the following Shapes:
    (a). Cone **(b).** Cylinder **(c).** Square inside a Circle **(d).** Circle inside a Square
12. Write an applet Program to design a simple calculator.
13. Write an Applet Program to animate a ball across the Screen.

CS 7: Digital Principles and Computer organization
(4 Hours – 4 Credits)

Unit I:

Number Systems and Codes: Binary Number system – Binary to decimal –decimal to binary – hexa decimal – ASCII code – Excess-3 Code – Gray code.
Digital Logic: The Basic Gates – NOT, OR, AND - Universal Logic Gates – NOR, NAND.

Unit II:

Combinatorial Logic Circuits: Boolean Laws and Theorems. - Sum of Products method - Truth table to Karnaugh Map – Pairs, Quads, Octets – Don't Care Conditions- Product-of sums method -Product-of sums Simplifications. Data Processing Circuits: Multiplexers – Demultiplexers-1-of-16 Decoder – BDC-to-decimal Decoders – Seven-segment Decoders – Encoders – Exclusive-OR Gates- Parity Generators and Checkers.

Unit III:

Arithmetic Circuits: Binary Addition- Binary Subtraction – 2'S Complement Representation - 2'S Complement Arithmetic – Arithmetic Building Blocks.

Unit IV:

Basic Computer organization and Design: Instruction codes - stored program organization - Computer registers and common bus system - Computer instructions - Timing and control - *Instruction cycle*: Fetch and Decode - Register reference instructions.Micro programmed Control: Control memory organization - Address sequencing, micro instruction format and symbolic microinstructions - symbolic micro-program - binary micro-program.

Unit V:

Central Processing Unit :General register organization - stack organization - instruction formats - addressing modes - Data transfer and manipulation - Program control. CISC and RISC - Parallel processing - Pipeline- general co. Input-output organization: Peripheral devices - I/O interface - *Memory organization*: Memory hierarchy - Main memory - Auxiliary memory

Text Book

1. Digital Principles and Applications – Donald P Leach, Albert Paul Malvino, GoutamSaha, 8th edition , McGraw-Hill Education, 3rd reprint 2015.
2. Computer System Architecture, M. Morris Mano, Pearson Education, 3rd edition., 2007

Unit I: 5: (5.1 to 5.9) and 2: (2.1 to 2.3) Text Book 1
Unit II: 3: (3.1 to 3.8) and 4: (4.1 to 4.7) Text Book 1
Unit III: 6: (6.1 to 6.8) Text Book 1
Unit IV: 5 (5.1 to 5.5) and 7 (7.1 to 7.3) Text Book 2
Unit V: 8 (8.1 to 8.8), 9 (9.1 to 9.2), Text Book 2 11 (11.1 to 11.5) and 12(12.1 to 12.3)

Reference Books:

1. Digital design, R.AnanthaNatarajan, PHI Learning, 2015.
2. Principles of digital Electronics, K.Meena, PHI Learning, 2013.
3. Digital Computer Fundamentals, Thomas C. Bartee TMH 2007.
4. Digital Circuits and Design, S. Salivahanan and S. Arivazhagan, Vikas Publishers, 2005.
5. Computer Organization and Architecture, V.Rajaraman and T.Radhakrishnan, PHI learning, 5th Print, 2015.
6. Computer Organization, Carl HamacherZvonkoVranesicSafwatZaky, McGraw Hill Education, 5th Edition, 11th reprint, 2015.
7. Computer Organization and Architecture, SmrutiRanjanSarangi, McGraw Hill Education.

AS 3: E-Commerce

(4 Hours – 4 Credits)

Objectives

- To enable the learners tounderstand the basic concepts of Electronic Commerce
- To enable the learners to use various applications in Electronic Commerce
- To enable the learners to enrich their knowledge about Cyberlaw.

Unit I:

Introduction to Electronic Commerce: Electronic Commerce Framework – Electronic Commerce and Media Convergence – The anatomy of E-Commerce Applications – Electronic Commerce Consumer Applications – Electronic Commerce Organization Applications. Internet Commercialization – Telco/Cable/Online Companies – National, Regional and Local level ISPs – Internet connectivity options-Logistics of being an Internet service provider.

Unit II:

Electronic Payment Systems: Types of Electronic Payment Systems – Digital Token Based – Smart Cards – Credit Card based EPS. Electronic Data Interchange: Applications in Business – Legal, Security and Privacy Issues – EDI and Electronic Commerce.

Unit III:

E-CRM – Meaning – Factors governing ECRM – advantages – difficulties. ERP – Meaning – Factors governing ERP – advantages – difficulties.

Unit IV:

IT Enabled Services – Medical, legal transcription – Mobile computing – call center service – E – governance – Digital Copyrights – Digital Signature – Software Agents.

Unit V:

Cyber Law – Introduction – Aims of Cyber Law - Cyber Law in India – Salient provisions of Cyber Law – E-Commerce Security issues – Risks involved in E-Commerce – Protecting E-Commerce System.

Text Books:

1. Frontiers of Electronic Commerce, Ravi Kalakota& Andrew Whinston, B., Perarson Education, New Delhi, 1996.
2. E-Commerce and its applications, Dr. U.S. Pandey, Rahul Srivastava, SaurabhShukla, S. Chand & Company Ltd., New Delhi, 2008.

Reference Books:

1. Electronic Commerce, Gary Schneider. P., Cengage Learning US, XII Edition, 2017.
2. Electronic Commerce – A Managerial Perspective, Efrain Turban, Jae Lee, David King, Michael Chung, H., Perarson Education, New Delhi, 2000.
3. Electronic Commerce, Peter Loshin, John R. Vacca, Charles River Media, 2003.
4. Electronic Commerce, Principles and Practice, HosseinBidgoli, Academic Press, 2002.
5. Electronic Commerce, Elias M. Awad, Prentice Hall, 2002.

SBS 3: Lab 6: Script Programming (HTML/Javascript/V 3sc ipt)
(2 Hours – 2 Credits)

Section A:

1. Design a html webpage to show various confectionary items using ordered list, unordered list and text styles like bold, underline, Italic, h1…h6,etc .
2. Design a html webpage for display your college course details with rowspan and colspan attribute using table
3. Design a CSS to create dropdown menu (Ex: your college website).
4. Write a VB Script program for a Fibonacci series using for looping.
5. Write a VB Script program for finding out whether the given year is a leap year or not
6. Write a VB Script program for 4 subjects marks; calculate the Total marks and grade
7. Write a VB Script program to display natural numbers up to n and write in a text file
8. Write a JavaScript program to user defined function to get array of values and sort them in ascending order
9. Write an HTML page that contains a selection box with a list of 5 countries In the above page when the user selects a country, its capital should be printed next to the list, and add CSS to customize the properties of the font of the capital.
10. Write a JavaScript program to set the background color of a paragraph with user choice
11. Write a JavaScript program to count the number of vowels in a given string
12. Write a JavaScript program to store current date-time in a COOKIE and display the 'Last visited on' date-time on the web page upon reopening of the same page.
13. Write a JavaScript function to check whether a given value is IP value or not.

Section B:

1. Design a Web Page in HTML to show your resume using Appropriate Formatting Elements with CSS.
2. Write an HTML page with Javascript that takes a number from one text field in the range 0-999 and display it in other text field in words.If the number is out of range ,it shold show "out of range" and if it is not a number ,it should show "not a number" message in the result box.
3. To design the scientific calculator and make event for each button using javascript
4. Design A user registration form In HTML(like gmail,naukri) with javascript validation
5. Design simple questionnaire(Quiz) webpage with validation using javascript

CS 8: Data Structures and Computer Algorithms
(4 Hours – 4 Credits)

Objective:

Learning concept of data structures, including its representation and operations performed on them, which are then linked to sorting, searching and indexing which are performed on them, to increase the knowledge of usage of data structures in algorithmic perspective.

Unit I:

Introduction, Basic Terminology, Elementary date, organization, data structure, Date structure operations, Algorithmic Notation, Control structures, complexity of algorithms, variables, data types.

Unit II:

Arrays: Introduction, Linear arrays, representation of linear arrays in memory, Traversing Linear arrays, Inserting & Deleting, Sorting: Bubble sort, searching: Linear search, Binary search, multidimensional arrays, Pointers, records.

Unit III:

Linked Lists: Introduction, Linked List, representation of Linked list in memory, traversing a linked list, Searching a linked list, Memory allocation, Garbage collection, Insertion into a linked list, Deletion from a linked list.

Unit IV:

Stacks: Introduction, Stacks, array representation of stacks, Linked representation of stacks, Quick sort. Recursion: Tower of Hanoi, Queues: Linked representation of Queues, Deques.

Unit V:

TREES: Introduction, Binary Trees, Representing Binary Trees in Memory, Traversing Binary Trees, Traversal Algorithms using Stacks, Binary Search Trees, Searching and Inserting in Binary Search Trees, Deleting in a Binary Search Tree. Graph: introduction, graph theory terminology, operation on graph.

Text book:

"Data structures", Seymour Lipschutz, Tata Mc-Graw Hill, 2006

UNIT 1: 1.1, 1.2, 1.3, 1.4 , 2.3, 2.4, 2.5, 2.8.
UNIT 2: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11.
UNIT 3: 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8.
UNIT 4: 6.1, 6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.10, 6.11, 6.12.
UNIT 5: 7.1, 7.2, 7.3, 7.4, 7.5, 7.7, 7.8, 7.9, 8.1, 8.2, 8.6.

Reference books:

1. Data structure using C++, VARSHA H. PATIL, Publisher: Oxford Higher Education/Oxford University Press, First edition, 2012.
2. Fundamentals of Data structures In C++, Ellis Horowitz, SartajSahni, Dinesh Mehta, University press, 2007.
3. Data Structures using C, Tanaenbaum A.S.,Langram Y. Augestein M.J, Pearson Education , 2004.
4. Introduction to the Design and Analysis of Algorithms, AnanyLevitin, Pearson Education 2003.

CS 9: Lab 7: Data Structures and Computer Algorithms
(6 Hours – 4 Credits)
SECTION - A

1. Implementing Stack as an array.
2. Implementing Stack as a linked list.
3. Convert Infix expression to Postfix expression using stack.
4. Convert Infix expression to Prefix expression using Stack.
5. Implementing Queue as an Array.
6. Implement Queue as a linked list.
7. Binary tree traversals.
8. Implement Binary Search Tree.

SECTION - B

1. Linear Search
2. Binary Search
3. Bubble Sort Algorithm.
4. Insertion Sort Algorithm.
5. Merge Sort Algorithm.
6. Quick Sort Algorithm.
7. Selection Sort Algorithm.

CS 10: Operating S /stems
(4 Hours – 4 Credits)

Unit I:

Introduction to Operating Systems: Introduction, What is an Operating systems, Operating system components and goals, Operating systems architecture. Process Concepts: Introduction, Process States, Process Management, Interrupts, Interprocess Communication.

Unit II:

Asynchronous Concurrent Execution: Introduction, Mutual Exclusion, Implementing Mutual Exclusion Primitives, Software solutions to the Mutual Exclusion Problem, Hardware solution to the Mutual Exclusion Problem, Semaphores. Concurrent Programming: Introduction, Monitors.

Unit III:

Deadlock and Indefinite Postponement: Introduction, Examples of Deadlock, Related Problem Indefinite Postponement, Resource concepts, Four Necessary conditions for Deadlock, Deadlock solution, Deadlock Prevention, Deadlock Avoidance with Dijkstra's Banker's algorithm, Deadlock Detection, Deadlock Recovery. **Processor Scheduling:** Introduction, Scheduling levels, Preemptive Vs Non-Preemptive Scheduling Priorities, Scheduling objective, Scheduling criteria, Scheduling algorithms.

Unit IV:

Real Memory Organization and Management: Introduction, Memory organization, Memory Management, Memory Hierarchy, Memory Management Strategies, Contiguous Vs Non-Contiguous Memory allocation, Fixed Partition Multiprogrammimg, Variable Partition multiprogramming. **Virtual Memory Management:** Introduction, Page Replacement, Page Replacement Strategies, Page Fault Frequency (PFF) Page replacement, Page Release, Page Size.

Unit V:

Disk Performance Optimization: Introduction, Why Disk Scheduling is necessary, Disk Scheduling strategies, Rotational optimization. **File and Database Systems:** Introduction, Data Hierarchy, Files, File Systems, File Organization, File Allocation, Free Space Management, File Access control.

Text Book:

Operating Systems, Deitel&Deitel&Choffnes, Pearson education, Third edition, 2008.
Unit I : Chapters 1.1, 1.2, 1.12, 1.13 & 3.1 to 3.5
Unit II : Chapters 5.1, 5.2, 5.3, 5.4(up to 5.4.2), 5.5, 5.6 & 6.1, 6.2
Unit III: Chapters 7.1 to 7.10 & 8.1 to 8.7
Unit IV: Chapters 9.1 to 9 6, 9.8, 9.9 & 11.1, 11.5, 11.6, 11.8, 11.9, 11.10
Unit V: Chapters 12.1, 12.4 to 12.6 & 13.1 to 13.8

Reference Books

1. An introduction to Operating systems concepts and Practice, Pramod Chandra P. Bhatt, PHI, Second Edition, 2008.
2. Operating System Concepts, Abraham Silberschatz Peter Galvin Greg Gagne, 6th edition Windows XP Update, Wiley India edition, 2007.
3. Operating Systems Principles and Design, Pal Choudhury, PHI Learning, 2011.
4. Operating Systems, A Concept Based Approach DhananjayM.Dhamdhere Tata McGraw Hill, 3rd Edition, 2012.

AS 4: Computer Graphics and Multimedia

(4 Hours – 4 Credits)

Unit I:

Overview of Graphics Systems: Video Display Devices – Raster Scan Systems – Random Scan Systems – Input Devices. **Output Primitives:** Points and Lines – Line Drawing Algorithms – Circle Generating Algorithms – Ellipse Generating Algorithms – Filled Area primitives.

Unit II:

Attributes of Output Primitives: Line Attributes – Curve Attributes – Color and Gray Scale Levels – Area Fill Attributes –Antialiasing. **Two–Dimensional Geometric Transformations:** Basic Transformations – Matrix Representations – Composite Transformations – Other Transformations – Transformations Between Coordinate Systems.

Unit III:

Two –Dimensional Viewing : The Viewing Pipeline – Viewing Coordinate Reference Frame – Window –to- Viewport Coordinate Transformation – Two-Dimensional Viewing Functions – Clipping Operations – Point Clipping – Line Clipping – Polygon Clipping – Curve Clipping – Text Clipping – Exterior Clipping.

Unit IV:

Multimedia hardware & software - Components of multimedia – Text, Image – Graphics – Audio – Video – Animation – Authoring. Color models – XYZ-RGB-YIQ-CMY-HSV Models

Unit V:

Multimedia communication systems – Multimedia Information Retrieval – Video conferencing – Virtual reality

Text Book

1. Hearn D and Baker M.P, "Computer graphics–C Version", 2ndEdition, Pearson Education, 2004. (For Units 1to3)
2. Ralf Steinmetz, Klara Steinmetz, "Multimedia Computing, Communications and Applications", Pearson Education, 2004. (For Units 4 and 5)

Reference Books

1. Computer Graphics, Multimedia and Animation – Malay K. Pakhira, Prentice Hall Of India Pvt. Ltd. , New Delhi – 2008.
2. Fundamentals Of Computer Graphics And Multimedia – D. P. Mukherjee, Prentice Hall Of India Pvt. Ltd. , New Delhi – 1999.
3. Siamon J. Gibbs ,Dionysios C. Tsichritzis, "Multimedia programming", Addison Wesley,1995.
4. John Villamil, Casanova ,LeonyFernanadez, Eliar, "Multimedia Graphics", PHI,1998.

SBS 4: Lab 8: Linux Programming

(2 Hours – 2 Credits)

1. Find the sum of the digits of a given number
2. Find the reverse of a number
3. Perform basic arithmetic operations using case
4. Display multiplication table
5. Check whether a number is prime or not using while
6. Convert lowercase to uppercase using tr statement
7. Check for an adam number
8. Check pattern matching using grep
9. Find the number of users who have logged in
10. Check for palindrome
11. Find age of a person using set date
12. Write a menu driven program to display today's date, Processes of the system, user's of the system, list files of the system
13. Read 10 names from a file and sort in
    a. Ascending order
    b. Descending order
14. Write a menu driven program to check for file existence, file readable or not, file writeable or not,
15. Get mark details of a student and display total and grade
16. Prepare electricity bill
17. To set the attributes of a given file
18. To check the given file is a directory or not
19. To create and append a file
20. To compare two files
21. To perform string manipulation.

CS 11: Database Management Systems

(4 Hours – 4 Credits)

Unit I:

OVERVIEW OF DATABASE SYSTEMS: Managing Data – A Historical Perspective – File Systems Versus a DBMS – Advantages of a DBMS – Describing and Storing Data in a DBMS – Queries in a DBMS – Transaction Management – Structure of a DBMS – People Who Work with Databases.INTRODUCTION TO DATABASE DESIGN: Database Design and ER Diagrams – Entities, Attributes, and Entity Sets – Relationships and Relationship Sets – Additional Features of ER Model – Conceptual Design With the ER Model.

Unit II:

THE RELATIONAL MODEL: Introduction to the Relational Model – Integrity Constraints over Relations – Enforcing Integrity Constraints – Querying Relational Data – Logical Database Design: ER to Relational – Introduction to Views – Destroying / Altering

Tables and Views.RELATIONAL ALGEBRA AND CALCULUS: Preliminaries – Relational Algebra: Selection and Projection – Set Operations –Renaming – Joins - Division Relational Calculus: Tuple Relational Calculus – Domain Relational Calculus

Unit III:

SQL:QUERIES, CONSTRAINTS, TRIGGERS: The Form of a Basic SQL Query - UNION, INTERSECT, and EXCEPT – Nested Queries – Aggregate Operators – Null Values – Complex Integrity Constraints in SQL – Triggers and Active Databases – Designing Active Databases

Unit IV:

SCHEMA REFINEMENT AND NORMAL FORMS: Introduction to Schema Refinement – Functional Dependencies – Reasoning about FD's – Normal Forms – Properties of Decompositions – Normalization – Schema Refinement in Database Design – Other Kinds of Dependencies

Unit V:

OVERVIEW OF TRANSACTION MANAGEMENT: The ACID Properties – Transactions and Schedules – Concurrent Execution of transactions – Lock Based Concurrency Control – Performance of Locking – Transaction Support in SQL – Introduction to Crash Recovery SECURITY AND AUTHORIZATION: Intoduction to Database Security - Access Control – Discretionary Access Control – Mandatory Access Control – Security for Internet Applications – Additional Issues Related to Security.

Text Book:

Database Management Systems – Raghu Ramakrishnan& Johannes Gehrke, McGraw Hill International Edition – Third Edition – 2003

UNIT – I	: 1.1 – 1.9 , 2.1 – 2.5
UNIT – II	: 3.1 – 3.7, 4.1 – 4.3
UNIT – III	: 5.2 – 5.9
UNIT – IV	: 19.1 – 19.8
UNIT – V	: 16.1 – 16.7, 21.1 – 21.6

Reference Books:

1. Database Management Systems - Alexis leon&mathews Leon, "Leon Vikas Publishing, Chennai, 2002.
2. Modern Database Management - Frad R. McFadden, Jeffrey A.Hoffer& Mary. B. Prescott, 5th Edition, Pearson Education Asia, 2001.
3. Database System Concepts – Abraham Silberschatz, Henry F.Korth, S.Sudarshan, McGraw Hill, 2006

CS 12: Software Engineering

(4 Hours 4 Credits)

Objectives

- To acquaint students with the basic concepts and major issues of software engineering
- To impart knowledge on the basic principles of software development life cycle.
- To know the benefits of software analysis, design, testing and documentation efforts

Unit I:

Introduction to Software Engineering: Some Definitions – Some Size factors – Quality and Productivity Factors – Managerial Issues. Planning a Software Project: Defining the Problem – Developing a Solution Strategy – Planning the Development Process – Planning an Organizational Structure – Other Planning Activities.

Unit II:

Software Cost Estimation: Software Cost Factors – Software Cost Estimation Techniques – Staffing-Level Estimation – Estimating Software Maintenance Costs.

Unit III:

Software Requirements Definitions: The Software Requirements Specification – Formal Specification Techniques – Languages and Processors for Requirements Specification.

Unit IV:

Software Design: Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real-Time and Distributed System Design – Test Plans – Milestones, Walkthroughs, and Inspections - Design Guidelines.

Unit V:

Verification and Validation Techniques: Quality Assurance – Static Analysis – Symbolic Execution – Unit Testing and Debugging – System Testing – Formal Verification.Software Maintenance: Enhancing Maintainability During Development – Managerial Aspects of Software Maintenance – Configuration Management – Source-Code Metrics – Other Maintenance Tools and Techniques.

Text book :

Software Engineering Concepts, Richard Fairley, Tata McGrawHill Publishing Company Limited, NewDelhi, 1997.

Unit – I : Chapters 1.1 – 1.4, 2.1-2.5
Unit – II : Chapter 3.1 - 3.4
Unit – III : Chapter 4.1 – 4.3
Unit – IV : Chapter 5.1 – 5.9
Unit – V : Chapters 8.1, 8.3 – 8.7, 9.1 – 9.5

Reference Books:

1. Software Engineering – K.L.James, Prentice Hall of India Pvt. Ltd., New Delhi, 2009.
2. Fundamentals of Software Engineering – Rajib Mall, Prentice Hall of India Pvt. Ltd., New Delhi, 2003.
3. Software Engineering – Bharat BhushanAgarwal&SumitPrakashTayal, Firewall Media, New Delhi, 2016.
4. Software Engineering, Jawadekar, Tata McGraw-Hill book Company, 2004.
5. Software Engineering a Practitioner's Approach, Roger S Pressman, Tata McGraw-Hill book Company, 6th edition, 2005

CS 13: Dot Net Programming

(4 Hours – 4 Credits)

Objectives:

- To discriminate between procedural and object-oriented programming languages.
- To identify and use the elements in the Visual Basic .Net environment.
- Ability to create simple console and Windows applications using VB .Net.
- Ability to create Database Applications.
- To develop the necessary skill to use a very powerful and popular front-end tool, Visual Basic. Net.

Unit I:

Introduction: .Net Framework- Components of the .Net framework - Introduction to Visual Basic.Net- Features of VB.Net -VB.Net - Program Structure – VB.Net Integrated Development Environment- Types of VB.Net ApplicationsVB.Net Basics: Identifiers- Keywords- Data Types- Variables- Constants and Enumerations- Modifiers- Operators – Statements & Directives.

Unit II:

Control Structures: Decision Making Statement - Loops- Loop Control Statements. Arrays: Arrays- Strings - VB.Net-Collections. Functions & Sub Procedures: Defining a Function – Function Returning a Value – Recursive Function – Param Arrays – Passing Arrays as Function Arguments - Sub Procedures.

Unit III:

Object Oriented Programming Paradigm: Classes & Objects- Interfaces – Delegate – Events - Event Handling - Exception Handling- File Handling.

Unit IV:

.Net Controls: Vb.Net Tool Box- Forms- Textbox- Label- Button- List Box- ComboBox- RadioButton- Check Box- PictureBox - ScrollBar – TrackBar – Container Controls. Advanced Controls: Progress Bar- DateTimePicker – Tree View – The TreeNode Class – ListView -ImageList –Tooltip – Rich Textbox –Timer Control – MDI Form

Unit V:

Dialog Boxes and Menus: Dialog Box- Modal Forms – Menus – Adding Cut, Copy and Paste Functionalities in a Form – Anchoring and Docking Controls in a Form. Database Access: Introduction to ADO.Net – ADO.Net Object Model – Connecting to a SQL Server Database – Cystral Reports

Text Book:

VB.NET Seeds, K.Krishnaveni, S.Sasikala, S.Pradeep Kumar Kenny, KK Publications, 2013.

Chapters:

Unit I : 1, 2
Unit II : 3, 4, 5
Unit III : 6, 7
Unit IV : 8, 9
Unit V : 10, 11, 12

Reference Books:

1. Microsoft Visual Basic .NET 2003 Unleashed, Heinrich Gantenbein, SAMs Publications, First Edition, 2004.
2. Programming VB.NET, A Guide For Experienced Programmers, Gary Cornell & Jonathan Morrison, Apress, 2002.
3. Visual Basic .NET Programming Black Book, Steven Holzner, DreamTech Press, 2010.
4. Programming Visual Basic .NET Dave Grundgeiger Publisher: O'Reilly First Edition January 2002.
5. Visual Basic .NET The Complete Reference Jeffrey R. Shapiro, The McGraw–Hill Companies,2002.

CS 14: Lab 9: Dot Net Programming (VB.Net)
(6 Hours – 4 Credits)

SECTION A - Console Applications

1. To perform Number Checking (Sum of Digits, Factorial, Armstrong)
2. To prepare a Student Mark Sheet using Struct&Enum.
3. To perform String Manipulation.
4. To Handle Built – in Exceptions.
5. To Handle User Defined Exceptions.
6. To prepare Pay Bill for Employees using Functions.
7. To prepare EB Bill using Constructor.
8. To perform Sorting on Numbers using an Array.
9. To calculate the area of different shapes using function overloading.

SECTION B - Windows Applications

10. To perform Number Checking (Sum of Digits, Factorial, Armstrong)
11. To prepare a Student Mark Sheet using Struct&Enum.
12. To perform String Manipulation.
13. To Handle Built – in Exceptions.
14. To Handle User Defined Exceptions.
15. To prepare Pay Bill for Employees using Functions.
16. To prepare EB Bill using Constructor.
17. To Design an Application Form using Win Form Controls.
18. To Design Login Form using Read – Write only Properties.
19. To prepare student mark statement using Database.

ES 11: Client / Server System
(5 Hours – 4 Credits)

Objectives

- To have an introduction to client server computing and to gain exposure on most common used servers.
- To have deep knowledge of hardware & software trends.
- Understand the concept of client-server development and learn problem solving skills.
- To overview the client server applications.
- Develop a client –server based application.

Unit I:

Introduction to Client/Server Computing: What is Client/Server Computing – Benefits of Client/Server Computing – Evolution of C/S Computing – Hardware Trends –

Software Trends-Evolution of Operating Systems – Networking(N/W) Trends – Business Considerations.

Unit II:

Overview of C/S Applications: Components of C/S Applications – Classes of C/S Applications – Categories of C/S Applications Understanding C/S Computing: Dispelling the Myths – Obstacles – Upfront & Hidden – Open Systems & Standards – Standards – Setting Organizations – Factors for Success.

Unit III:

The Client Hardware & Software: Client Component – Client Operating Systems – What is GUI – Database Access – Client Software Products: GUI Environments – Converting 3270/5250 Screens – Database Tools – Client Requirements: GUI Design Standards – Open GUI Standards – Interface Independence – Testing Interfaces.

Unit IV:

The Server: Categories of Servers – Features of Server Machines – Classes of Server Machines Server Environment: N/W Management Environment – N/W Computing Environment – Extensions – Network Operating System – Loadable Module.

Unit V:

Server Operating System: OS/2 2.0 – Windows New Technology – Unix Based OS – Server Requirements: Platform Independence – Transaction Processing – Connectivity – Intelligent Database – Stored Procedure – Triggers – Load Leveling – Optimizer – Testing and Diagnostic Tools – Backup & Recovery Mechanisms.

Text Book:

Client / Server Computing, Dawna Travis Dewire, Tata McGraw Hill, 1994
Unit I : Chapters 1, 2
Unit II : Chapters 3, 4
Unit III : Chapters 5.1-5.3 , 5.5, 6, 7
Unit IV: Chapters 8, 9
Unit V : Chapters 10, i 1

Reference Books:

1. Client/ Server Computing, Patrick Smith, Steve Guengerich, Second Edition, Prentice Hall of India Private Limited, New Delhi, 2002.
2. An Introduction to Client Server Computing, Subash Chandra Yadav& Sanjay Kumar Singh, New Age International (P) Limited, Publishers, New Delhi, 2009.
3. The Complete Guide to Client/Server Computing, Eric Johnson, Prentice Hall of India Private Limited, New Delhi, 2002.
4. Client Server Computing, Devendra Kumar, Global Academic Publishers & Distributors, 2015.
5. Client/server Computing: Architecture, Applications, and Distributed Systems Management, Bruce R. Elbert, Artech House, 1994.

ES 12: Soft Computing
(5 Hours – 4 Credits)

Objective

- To Learn the various soft computing frame works
- To understand design of various neural networks
- Be exposed to fuzzy logic
- To study the genetic programming.

Unit I:

Introduction, Artificial Intelligence, Artificial Neural Networks, Fuzzy Systems, Genetic Algorithm and Evolutionary Programming, Swarm Intelligent Systems, Expert Systems: Expert System Architecture.

Unit II:

Introduction to Neural Networks, Biological Inspiration, Biological Neural Networks to Artificial Neural Networks, Classification of ANNs, First-generation Neural Networks, Introduction to Second-generation Neural Networks, Introduction to Third-Generation Neural Networks

Unit III:

Introduction to Fuzzy Logic, Human Learning Ability, Imprecision, and Uncertainty, Undecidability, Probability Theory vs Possibility Theory, Classical Sets and Fuzzy Sets, Fuzzy Set Operations, Fuzzy Relations, Fuzzy Composition.

Unit IV:

Introduction to Genetic Algorithms, Genetic Algorithms, Procedures of Gas, Working of Gas.

Unit V:

Introduction to Swarm Intelligence, Background of Swarm Intelligent Systems, Ant Colony System, Working of Ant Colony Optimisation, Ant Colony Optimisation Algorithm for TSP.

Text Book:

"Soft computing with MATLAB programming", N.P.Padhy, S.P.Simon, Oxford University Press, 2015

Unit 1: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7(1.7.1).
Unit 2: 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 4.1.
Unit 3: 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8.
Unit 4: 7.1, 7.2, 7.3, 7.4.
Unit 5: 8.1, 8.2, 8.3, 8.4, 8.5.

Reference Books:

1. S.N.Sivanandam and S.N.Deepa, Principles of Soft computing, Wiley India Edition, 2nd Edition, 2013.
2. Simon Haykin, 'Neural Networks', Pearson Education, 2003.
3. John Yen & Reza Langari, 'Fuzzy Logic – Intelligence Control & Information', Pearson Education, New Delhi, 2003
4. N.P.Padhy, " Artificial Intelligence and Intelligent Systems", Oxford, 2013.

ES 13: Information Security
(5 Hours – 4 Credits)

Objectives:

- To have through understanding on basic terminology and concepts related to network and system level security.
- To get an idea about the basics of computers and networking including Internet Protocol, routing, Domain Name Service, and network devices.
- To be exposed to basic cryptography, security management, and network security techniques.
- To apply the policies as a tool to effectively change an organization's culture towards a better secure environment.

Unit I:

Introduction: History of Information security - What is Security? - CNSS Security Model - Components of an Information System - Balancing Information security and Access – Approaches to Information security implementation - The SDLC - The Security SDLC.

Unit II:

Security Investigation: Need for Security, Business Needs, Threats, Attacks, Professional, Legal and Ethical Issues in Information security.

Unit III:

Managing IT Risk: An overview of Risk Management - Risk Identification – Risk Assessment - Risk Control Strategies- Selecting Risk Control Strategy – Quantitative Versus Qualitative Risk Control Practices.ling Risk.

Unit IV:

How to plan for security: Information security Planning and Governnance - Information Security Policy, Standards and Practices - ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture – Continuity strategies.

Unit V:

Security Technology: Introduction – Intrusion detection and prevention systems - Scanning and Analysis Tools – Biometric access controls – Cipher methods – Cryptographic

algorithms – Cryptographic tools – Protocols for secure communication- Attacks on Cryptosystems.

Text book:

Principles of Information Security, Michael E Whitman and Herbert J Mattord, Fourth Edition, CENGAGE Learning, 6th Indian Reprint, 2013.

Unit I : Chapter 1
Unit II : Chapter 2, 3
Unit III : Chapter 4
Unit IV : Chapter 5
Unit V : Chapter 7, 8

Reference books:

1. Handbook of Information Security Management, Micki Krause, Harold F. Tipton, Vol. 1-3, CRC Press LLC, 2004.
2. Hacking Exposed, Stuart McClure, Joel Scrambray, George Kurtz, Tata McGraw-Hill, 2003 3. Computer Security Art and Science, Matt Bishop, Pearson/PHI, 2002.
3. Information Security: A Complete Guide to IT Security, RajatKhare, Printice Hall of India, 2006.
4. Information Security: The Complete Reference. Mark Rhodes-Ousley, 2013.

SBS 5: Lab 10 : PHP and MySQL
(2 Hours – 2 Credits)

Section A:

1. Write a program to compute the sum of the digits of a number. (Input get Using Form)
2. Write a program to inserts a new item in an array in any position. (Input get Using Form)
   Expected Output :
   Original array :
   1 2 3 4 5
   After inserting '$' the array is :
   1 2 3 $ 4 5
3. Write a program to sort the following associative array :
   array("Sophia"=>"31","Jacob"=>"41","William"=>"39","Ramesh"=>"40") in
   a) ascending order sort by value
   b) ascending order sort by Key
   c) descending order sorting by Value
   d) descending order sorting by Key
   e) transform a string all uppercase letters.
   f) transform a string all lowercase letters.
   g) make a string's first character of all the words uppercase.
4. Write a program using nested for loop that display a chess board

5. Write a program to compute and return the square root of a given number (Without default array function) (Input get Using Form)
6. Write a program to print Fibonacci series using recursion.
7. Write a program to validate given input is date or not and create simple 'birthday countdown' script, the script will count the number of days between current day and birthday
8. Write a program to store current date-time in a COOKIE and display the 'Last visited on' date-time on the web page upon reopening of the same page.
9. Upload and Display images in particular directory

Section B:

1. To design an student details database using HTML Form and process using PHP(Add, Edit, delete, View records) with login option
2. To design an Employee details database using HTML Form and process using PHP(Add, Edit, delete, View records) with login option

Note: Use MySqli or PDO for database connectivity

CS 15: Computer Networks
(5 Hours – 4 Credits)

Unit I:

Introduction: Uses of Computer Networks - Network Hardware – LAN, MAN and WAN- Network Software - Reference Models- Example Networks.

Unit II:

Physical Layer: The Theoretical Basis For Data Communication - Guided Transmission media - Wireless Transmission - Communication Satellites- Public Switched Telephone Network- The Mobile Telephone System

Unit III:

Data Link Layer: Data Link Layer Design Issues - Error Detection and Correction – Elementary data link protocols - Sliding Window Protocols – Example Data Link Protocols.

Unit IV:

Network Layer: Network Layer Design Issues- Routing Algorithms-Congestion Control Algorithms- Quality of Service –Internetworking.**Transport Layer:** Transport Services – Elements of transport protocols – Performance issues.

Unit V:

Application layers: Domain name system – Electric mail – The World Wide Web. **Network security:** Cryptography- Symmetric-Key algorithms- Public-Key algorithms – Digital signature.

Text Book:
Computer Networks‖ Andrew S.Tanenbaum , David J.Wetherall, Fifth edition, Pearson Education , 2011

CS 16: Web Programming
(5 Hours – 4 Credits)

Unit I:

INTRODUCTION: Internet Principles – Basic Web Concepts – Client/Server model – retrieving datafrom Internet – HTM and Scripting Languages – Standard Generalized Mark –uplanguages – Next Generation – Internet –Protocols and Applications.

Unit II:

COMMON GATEWAY INTERFACE PROGRAMMING: HTML forms – CGI Concepts – HTML tags Emulation – Server – Browser Communication – E-mail generation – CGI client Side applets – CGI server applets– authorization and security.

Unit III:

SCRIPTING LANGUAGES: Dynamic HTML-Cascading style sheets-Object model and Event model- Filtersand Transitions-Active X Controls-Multimedia-Client side script - VB Scriptprogramming – Forms – Scripting Object.

Unit IV:

SERVER SIDE PROGRAMMING: XML – Server side includes – communication – DTD – Vocabularies – DOMmethods – Firewalls– Proxy Servers.

Unit V:

SERVELETS AND JSP: JSP Technology Introduction-JSP and Servelets- Running JSP Applications BasicJSP- JavaBeans Classes and JSP-Tag Libraries and Files- Support for the ModelView-Controller Paradigm- Case Study- Related Technologies.

Text Books:

1. Deitel H.M and Deitel P.J., "Internet and World Wide Web How to program",Pearson International, 2012, 4th Edition. (Ch-1, 4, 5, 6, 12, 14, 26, 27)
2. Gopalan N.P. and Akilandeswari. J, "Web Technology", PHI,2011. (Ch-1 to 11)
3. Paul Dietel and Harvey Deitel,"Java How to Program", PHI,8th Edition. (Ch-29)

Reference Books:

1. Mahesh P. Matha, "Core Java A Comprehensive study", Prentice Hall ofIndia, 2011.
2. UttamK.Roy, "Web Technologies", Oxford University Press, 2011.

CS 17: Lab 11: Web Programming
(6 Hours – 4 Credits)

1. Write programs in Java to demonstrate the use of following components:
   i. Text fields, buttons, Scrollbar, Choice, List and Check box.
2. Write Java programs to demonstrate the use of various Layouts like FlowLayout,
   i. Border Layout, Grid Layout and card layout.
3. Write programs in Java to create applets incorporating the followingfeatures:
   i. Create a color palette with matrix of buttons
   ii. Set background and foreground of the control text area by selectinga color from color palette.
   iii. In order to select Foreground or background use check box controlas radio buttons
4. Write programs in Java to do the following.
   i. Set the URL of another server.
   ii. Download the homepage of the server.
   iii. Display the contents of homepage with date, content type, andExpiration date. Last modified and length of the home page.
5. Write programs in Java using sockets to implement the following:
   i. HTTP request
   ii. FTP
   iii. SMTP
   iv. POP3
6. Write a program in Java for creating simple chat application with datagramsockets and datagram packets.
7. Write programs in Java using Servlets:
   i. To invoke servlets from HTML forms
   ii. To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using servlets forconducting on-line examination for displaying student mark list. Assumethat student information is available in a database which has been stored ina database server.

9. Create a web page with the following using HTML
   i. To embed a map in a web page
   ii. To fix the hot spots in that map
   iii. Show all the related information when the hot spots are clicked.
10. Create a web page with the following.
    i. Cascading style sheets.
    ii. Embedded style sheets.
    iii. Inline style sheets. Use our college information for the web pages.

ES 21: Data Mining
(5 Hours – 4 Credits)

Objectives

- To make the student understand Data mining principles and techniques and Introduce DM as a cutting edge business intelligence
- To introduce the concepts of Data warehousing Architecture and Implementation
- To introduce the concepts of classification, clustering and association rules.
- To study the overview of developing areas – Web mining, Text mining and ethical aspects of Data mining

Unit I:

Introduction: Data mining application – data mining techniques – data mining case studies the future of data mining – data mining software.**Association rules mining:** Introduction -Basics-task and a Naive algorithm- Apriori algorithm – improve the efficiency of the Apriori algorithm – mining frequent pattern without candidate generation (FP-growth) – performance evaluation of algorithms.

Unit II:

Data warehousing: Introduction – Operational data sources- data warehousing – Data Warehousing design – Guidelines for data warehousing implementation - Data warehousing -Metadata. Online analytical processing (OLAP): Introduction – OLAP characteristics of OLAP system – Multidimensional view and data cube - Data cube implementation – Data Cube operations OLAP implementation guidelines.

Unit III:

Classification: Introduction – decision tree – over fitting and pruning - DT rules – Naïve Bayes method- estimation predictive accuracy of classification methods - other evaluation criteria for classification method – classification software.

Unit IV:

Cluster analysis: cluster analysis – types of data – computing distances-types of cluster analysis methods - partitioned methods – hierarchical methods – density based methods – Dealing with large databases – quality and validity of cluster analysis methods – cluster analysis software.

Unit V:

Web data mining: Introduction- web terminology and characteristics- locality and hierarchyin the web- web content mining-web usage mining- web structure mining – web mining software.

Search engines: Search engines functionality- search engines architecture – Ranking of web pages.

Text Book:

Introduction to Data mining with case studies, G.K. Gupta, PHI Private limited, New Delhi, 2008.

Unit I :Chapters 1 & 2
Unit II : Chapters 7 & 8
Unit III: Chapter 3
Unit IV: Chapter 4
Unit V : Chapters 5 & 6

Reference Books:

1. Data Warehousing, Data Mining & OLAP, Alex Berson and Stephen J. Smith, Tata McGraw – Hill Edition, Tenth Reprint 2007.
2. Data Mining Concepts and Techniques, Jiawei Han and MichelineKamber, Second Edition, Elsevier, 2007.
3. Data Mining – Typical Mining process for Predictive Modeling, BPB Publications, 2004.
4. Data Mining Concepts and Techniques byJiawei Han and MichelineKamber, 2nd Edition, Morgan Kaufmann Publishers (An imprint of Elsevier).
5. Data Mining and Analysis Fundamental Concepts and Algorithms Mohammed J. Zaki Wagner Meira Jr., Cambridge University Press, 2014.

ES 22: Mobile Computing
(5 Hours – 4 Credits)

Objectives

- Understand the basic concepts of mobile computing
- Be familiar with the network protocol stack
- Learn the basics of mobile telecommunication
- system Be exposed to Ad-Hoc networks
- Gain knowledge about different mobile platforms and application development

Unit I:

INTRODUCTION: Mobile Computing – Mobile Computing Vs wireless Networking – Mobile Computing Applications –Characteristics of Mobile computing – Structure of Mobile Computing Application. MAC Protocols – Wireless MAC Issues – Fixed Assignment Schemes – Random Assignment Schemes – Reservation Based Schemes.

Unit II:

MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER: Overview of Mobile IP – Features of Mobile IP – Key Mechanism in Mobile IP – route Optimization. Overview of TCP/IP – Architecture of TCP/IP- Adaptation of TCP Window – Improvement in TCP Performance.

Unit III:

MOBILE TELECOMMUNICATION SYSTEM: Global System for Mobile Communication (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Telecommunication System (UMTS).

Unit IV:

MOBILE AD-HOC NETWORKS: Ad-Hoc Basic Concepts – Characteristics – Applications – Design Issues – Routing – Essential of Traditional Routing Protocols – Popular Routing Protocols – Vehicular Ad Hoc networks (VANET) – MANET Vs VANET – Security.

Unit V:

MOBILE PLATFORMS AND APPLICATIONS: Mobile Device Operating Systems – Special Constrains & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry, Windows Phone – MCommerce – Structure – Pros & Cons – Mobile Payment System – Security Issues.

Text Book:

Prasant Kumar Pattnaik, Rajib Mall, "Fundamentals of Mobile Computing", PHI Learning Pvt. Ltd, New Delhi, 2012.

Chapters

Unit I : Chapters 2, 3
Unit II : Chapters 4, 5
Unit III : Chapters 2
Unit IV : Chapters 7
Unit V : Chapters 9

Reference Books:

1. Jochen H. Schller, "Mobile Communications", Second Edition, Pearson Education, New Delhi, 2007.
2. Dharma PrakashAgarval, Qing and An Zeng, "Introduction to Wireless and Mobile systems", Thomson AsiaPvt Ltd, 2005.
3. UweHansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing",Springer, 2003.
4. William.C.Y.Lee,"Mobile Cellular Telecommunications-Analog and Digital Systems", Second Edition,TataMcGraw Hill Edition,2006.
5. Mobile Computing, V.JeyasriArokiamary, Technical Publications, 2009.

ES 23: Software Testing and Quality Assurance

(5 Hours – 4 Credits)

Objectives

- Know what is software and the usage of different types of softwares.
- Know the Quality Metrics of various Softwares.
- Know the methodologies in making Software.

- Test the product finally to check the product Quality.

Unit I:

Software Testing: Introduction, Meaning, What is Bug? Reasons of Bugs, Cost of Bugs, Software Tester Task.Introduction to Software Development Models Software Testing: Testing Axioms, Terms & Definitions.Testing Fundamentals: Types, Black Box, White Box, Static& Dynamic Testing. Static Black Box Testing.Dynamic Black Box Testing: Test to Pass & Test to Fail, Equivalence Partitioning, Data Testing, State Testing, Other Black Box Testing Techniques.

Unit II:

Static White Box Testing: Formal Reviews, Peer Reviews, Coding Standards and Guidelines.Review Check List. Dynamic White Box Testing: Comparison with Debugging, Testing Pieces: Unit & Integration Testing. Data Coverage & Code Coverage.Configuration Testing: Overview, Software and Hardware Devices. Deciding Hardware Configurations.Compatibility Testing: Overview, Backward and Forward Compatibility. Testing Multiple versions. Data Sharing Compatibility. User Interface Testing: Effective UI, Testing for Disabled.

Unit III:

Documentation Testing: Types of Documentation, Importance of Documentation Testing Security Testing Threat Modelling, Buffer Overrun, Safe String Functions, Computer Forensics.
Web Site Testing: Web Page Fundamentals, Black Box Testing: Text, Hyperlinks, graphics, Forms. Gray Box Testing & White Box Testing, Configuration and Compatibility Testing

Unit IV:

Testing Tools: Benefits of Automation and Tools. Test Tools, Software Test Automation. Random Testing: Monkeys & Gorillas.Bug Bashes & Beta Testing: Test Sharing, Beta Testing, Outsourcing. Planning Testing: Goals, Test phases, Strategy, Resource Requirements, Schedule, Test Cases, Bug Reporting, Metrics.Test Cases: Test Case Planning, Design, Cases, Procedures, Organization and Tracking. Bug Life Cycle and Tracking System.

Unit V:

Software Quality Assurance: What is Quality? Testing and Quality Assurance in Workplace. Test Management.Organisational Structures: CMM Capability Maturity Model, ISO 9000.

Text Book:

Software Testing And Quality Assurance, Lovely Professional University, Excel Books Private Limited, New Delhi, 2012.

Unit I : Chapters 1, 2
Unit II : Chapters: 3, 4
Unit III: Chapter: 5, 6

Unit IV: Chapter: 7, 8
Unit V : Chapters: 9, 10

Reference Books:

1. Daniel Galin, —Software Quality Assurance – from Theory to Implementation‖ , PearsonEducation, 2009
2. Yogesh Singh, "Software Testing", Cambridge University Press, 2012
3. AdityaMathur, —Foundations of Software Testing‖ , Pearson Education, 2008
4. Ron Patton, —Software Testing‖ , Second Edition, Pearson Education, 2007
5. SrinivasanDesikan, Gopalaswamy Ramesh, —Software Testing – Principles and Practices,Pearson Education, 2006
6. Alan C Gillies, —Software Quality Theory and Management‖ , Cengage Learning, SecondEdition, 2003.
7. Robert Furtell, Donald Shafer, and Linda Shafer, "Quality Software Project Management",Pearson Education Asia, 2002.

SBS 6: Lab 12:Mobile Application Development

(2 Hours – 2 Credits)

Objectives:

- Know the components and structure of mobile application development frameworks for Android and windows OS based mobiles.
- Understand how to work with various mobile application development frameworks.
- Learn the basic and important design concepts and issues of development of mobile applications.
- Understand the capabilities and limitations of mobile devices.

List of Experiments

1. Develop an application that uses GUI components, Font and Colours
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a native calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an application that makes use of database.
6. Develop an application that makes use of RSS Feed.
7. Implement an application that implements Multi-threading
8. Develop a native application that uses GPS location information.
9. Implement an application that writes data to the SD card.
10. Implement an application that creates an alert upon receiving a message.
11. Write a mobile application that creates alarm clock

Note: Standalone desktops with Windows or Android or iOS or Equivalent Mobile Application Development Tools with appropriate emulators and debuggers.