

**HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)
COIMBATORE - 641 028**

BACHELOR OF COMPUTER APPLICATIONS (BCA)

SCHEME OF EXAMINATIONS – CBCS PATTERN

(For the students admitted from the Academic year 2016 - 2017 and onwards)

| CODE NO. | SUBJECT | LECTURE HRS / WEEK | EXAM DURATION (HRS) | MAX.MARKS | | | CREDIT POINTS |
|---|--|-----------------------|---------------------------|-----------|----|-------|------------------|
| | | | | IE | EE | TOTAL | |
| First Semester | | | | | | | |
| | Part-I | | | | | | |
| 16LAT01/ 16LAH01/ 16LAM01/ 16LAF01 | Tamil-I/ Hindi-I/ Malayalam- I/ French-I | 6 | 3 | 25 | 75 | 100 | 3 |
| | Part-II | | | | | | |
| 16ENG01 | English – I | 6 | 3 | 25 | 75 | 100 | 3 |
| | Part-III | | | | | | |
| 16CAU01 | Programming with C | 5 | 3 | 25 | 75 | 100 | 4 |
| 16CA002 | Practical I : Programming lab – C | 4 | 3 | 40 | 60 | 100 | 3 |
| 16CAU03 | Digital Fundamentals and Architecture | 5 | 3 | 25 | 75 | 100 | 4 |
| 16CAU04 | Data Structures | 4 | 3 | 25 | 75 | 100 | 3 |
| Second Semester | | | | | | | |
| | Part-I | | | | | | |
| 16LAT02/ 16LAH02/ 16LAM02/ 16LAF02 | Tamil-II/ Hindi-II/ Malayalam-II/ French-II | 6 | 3 | 25 | 75 | 100 | 3 |
| | Part-II | | | | | | |
| 16ENG02 | English – II | 6 | 3 | 25 | 75 | 100 | 3 |
| | Part-III | | | | | | |
| 16CAU05 | Programming with C++ | 5 | 3 | 25 | 75 | 100 | 4 |
| 16CAU06 | Practical II : Programming Lab - C++ | 4 | 3 | 40 | 60 | 100 | 3 |
| 16CAU07 | Practical III : Office Automation Lab | 2 | 3 | 40 | 60 | 100 | 2 |
| 16CAU08 | Allied : Numerical Methods (MAT) | 5 | 3 | 25 | 75 | 100 | 3 |
| | Part-IV | | | | | | |
| 16GSU01 | Value Education - Human Rights | 2 | | 100 | | 100 | 2 |
| Third Semester | | | | | | | |
| | Part-III | | | | | | |
| 16CAU09 | System Software and Operating System | 5 | 3 | 25 | 75 | 100 | 4 |
| 16CAU10 | Java Programming | 5 | 3 | 25 | 75 | 100 | 4 |
| 16CAU11 | Practical IV : Java Programming Lab | 4 | 3 | 40 | 60 | 100 | 3 |
| 16CAU12 | Web Technology | 5 | 3 | 25 | 75 | 100 | 4 |
| 16CAU13 | Practical V : Web Technology Lab | 4 | 3 | 40 | 60 | 100 | 3 |

| | | | | | | | |
|------------------------|---|---|---|-----|----|-----|-----|
| 16CAU14 | Allied : Mathematical Structures(MAT) | 5 | 3 | 25 | 75 | 100 | 3 |
| | Part-IV | | | | | | |
| 16GSU02 | Environmental Studies | 2 | | 100 | | 100 | 2 |
| Fourth Semester | | | | | | | |
| | Part-III | | | | | | |
| 16CAU15 | Visual Basic and VC++ | 6 | 3 | 25 | 75 | 100 | 5 |
| 16CAU16 | Practical VI: Visual Basic and VC++ Lab | 5 | 3 | 40 | 60 | 100 | 4 |
| 16CAU17 | Relational Database Management System | 6 | 3 | 25 | 75 | 100 | 5 |
| 16CAU18 | Practical VII: Programming Lab - Oracle | 5 | 3 | 40 | 60 | 100 | 4 |
| 16CAU19 | Allied : Business Accounting(COM) | 6 | 3 | 25 | 75 | 100 | 3 |
| | Part-IV | | | | | | |
| 16GSU03 | Skill Based : Internet Security | 2 | - | 100 | - | 100 | 2 |
| | Part-V | | | | | | |
| 16GSU04 | Extension Activity | | | 100 | | 100 | 2 |
| Fifth Semester | | | | | | | |
| | Part-III | | | | | | |
| 16CAU20 | Software Engineering | 6 | 3 | 25 | 75 | 100 | 5 |
| 16CAU21 | TCP/IP Protocol suite | 6 | 3 | 25 | 75 | 100 | 5 |
| 16CAU22 | Computer Graphics and Multimedia | 6 | 3 | 25 | 75 | 100 | 5 |
| 16CAU23 | Practical VIII : Computer Graphics and Multimedia Lab | 6 | 3 | 40 | 60 | 100 | 4 |
| 16CAU24 | Elective - I (a) Data mining and Warehousing (OR) (b) Computer Installation and Services | 6 | 4 | 25 | 75 | 100 | 4 |
| | Part-IV | | | | | | |
| 16GSU05 | Non Major Elective : General Awareness | | | 100 | | 100 | 2 |
| | Part-V | | | | | | |
| 16GSU06 | Law of Ethics | | | 100 | | 100 | 2 |
| Sixth Semester | | | | | | | |
| | Part-III | | | | | | |
| 16CAU25 | Software Testing | 6 | 3 | 25 | 75 | 100 | 5 |
| 16CAU26 | Practical IX : ST and SPM Lab | 6 | 3 | 40 | 60 | 100 | 4 |
| 16CAU27 | PHP and ASP.Net | 6 | 3 | 25 | 75 | 100 | 5 |
| 16CAU28 | Practical X : PHP and ASP.Net Lab | 6 | 3 | 40 | 60 | 100 | 4 |
| 16CAU29 | Elective - II (a) Mobile Computing (OR) (b) Client Server | 6 | 3 | 25 | 75 | 100 | 4 |
| 16CAU30 | Project Work | | | 40 | 60 | 100 | 4 |
| | | | | | | | 141 |

REGULATIONS

Components for Evaluation:

4. Internal Examination Marks (For Part III theory papers)

| Components | Marks |
|----------------------------|-----------------------------|
| Test -I & II (Best of Two) | 10 |
| Model Exam | 10 |
| Assignment | 5 |
| Total | ----- 25 ===== |

QUESTION PAPER PATTERN FOR I.E TEST I and II (2 HOURS TEST)

MAXIMUM: 50 Marks

SECTION - A (20 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks

Short answers 10

(10 x 2 = 20 marks)

SECTION - B (10 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks

Either or Type

(2 x 5 = 10 marks)

SECTION - C (20 Marks)

Answer any **TWO** Questions out of **THREE** questions

ALL Questions Carry **EQUAL** Marks

(2 x 10 = 20 marks)

QUESTION PAPER PATTERN FOR IE Model Examination

(3 HOURS TEST)

Marks

MAXIMUM: 75

SECTION - A (20 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks

TWO questions from each unit

(10 x 2 = 20 marks)

SECTION - B (25 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks

Either or Type.

ONE question from each unit with internal choice

(5 x 5 = 25 marks)

SECTION - C (30 Marks)

Answer any **THREE** Questions out of **FIVE** questions

ALL Questions Carry **EQUAL** Marks
ONE question from each unit

(3 x 10 = 30 marks)

2 a) Components for Practical I.E.

| Components | Marks |
|--------------|-----------------------------|
| Test –I | 20 |
| Test – II | 20 |
| Total | ----- 40 ===== |

2 b) Components for Practical E.E.

| Components | Marks |
|---------------------------|-----------------------------|
| Completion of Experiments | 50 |
| Record | 5 |
| Viva | 5 |
| Total | ----- 60 ===== |

3 Institutional/ Industrial Training, Mini Project and Major Project Work

| <u>Institutional /Industrial Training</u> | | <u>Mini Project</u> | <u>MajorProject Work</u> | |
|---|------------------------------|------------------------------|-----------------------------------|------------------------------|
| Components | Marks | Marks | Components | Marks |
| I.E | | | I. E | |
| Work Diary | 25 | - | a) Attendance 10 Marks | 40 |
| Report | 50 | 50 | b) Review / | |
| Viva –voce | 25 | 50 | Work Diary* ¹ 30 Marks | |
| Examination | | | | |
| Total | ----- 100 ===== | ----- 100 ===== | E.E * ² | |
| | | | a) Final Report 40 Marks | 60 |
| | | | b) Viva-voce 20 Marks | |
| | | | Total | ----- 100 ===== |

*¹ Review is for Individual Project and Work Diary is for Group Projects (group consisting of minimum 3 and maximum 5)

*²Evaluation of report and conduct of viva voce will be done jointly by Internal and External Examiners

4. Components for Value Education (Part IV):

| S.No. | Components | Marks |
|--------------|---|------------------|
| a) | Attendance 96% and above - 30 marks 91% to 95% - 25 marks 86% to 90% - 20 marks 76% to 85% - 10 marks | 30 marks |
| b) | Participation in group activity | 30 marks |
| c) | Assignment (2 x 10) | 20 marks |
| d) | Test (1 hr for 20 marks) 2 out of three questions, 10 marks each | 20 marks |
| Total | | 100 marks |

On completion of the above components students will be remarked as follows:

| Range of marks | Equivalent remarks |
|----------------|----------------------------------|
| 80 and above | Exemplary |
| 70 – 79 | Very good |
| 60 – 69 | Good |
| 50 – 59 | Fair |
| 40 – 49 | Satisfactory |
| Below 39 | Not Satisfactory = Not completed |

- The passing minimum for this paper is 40%
- In case, the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent semesters.

5. Guidelines for Environmental Studies (Part IV)

- The paper Environmental Studies is to be treated as 100% IE course which is offered in III Semester for II year UG students.
- The classes will be handled for two hours per week till the end of the Semester. At least one field trip should be arranged.
- Total Marks for the subject = 100

| Components | Marks |
|----------------------------------|------------------------------|
| Two Tests (2 x 30) | 60 |
| Field visit and report (10 + 10) | 20 |
| Two assignments (2 x 10) | 20 |
| Total | ----- 100 ===== |

The question paper pattern is as follows:

Test I – 2 hours [3 out of 5 essay type questions] 3 x 10 = 30 Marks

Test II – 2 hours [3 out of 5 essay type questions] 3 x 10 = 30 Marks

Total 60 Marks

- The passing minimum for this paper is 40%
- In case, the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent semesters.

6. Guidelines for Skill based subject - Internet Security (Part IV)

| Components | Marks |
|--------------------------|------------------------------|
| Two Tests (2 x 40) | 80 |
| Two assignments (2 x 10) | 20 |
| Total | ----- 100 ===== |

The question paper pattern is as follows:

- a) Test I – 2 hours [4 out of 7 essay type questions] 4 x 10 = 40Marks
 b) Test II – 2 hours [4 out of 7 essay type questions] 4 x 10 = 40 Marks

Total 80 Marks

- The passing minimum for this paper is 40%
- In case, the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent semesters

7. Guidelines for General Awareness (Part IV)

| Components | Marks |
|--------------------|-------|
| Two Tests (2 x 50) | 100 |

The question paper pattern is as follows:

- Test I – 2 hours [50 multiple choice questions] 50 x 1 = 50Marks
 Test II – 2 hours [50 multiple choice questions] 50 x 1 = 50 Marks

Total 100 Marks

- The passing minimum for this paper is 40%
- In case, the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent semesters

8. Guidelines for Law of Ethics (Part V)

| Components | Marks |
|--------------------|-------|
| Two Tests (2 x 50) | 100 |

The question paper pattern is as follows:

- a) Test I – 2 hours [5 out of 8 essay type questions] 5 x 10 = 50Marks
b) Test II – 2 hours [5 out of 8 essay type questions] 5 x 10 = 50 Marks

Total 100 Marks

- The passing minimum for this paper is 40%
- In case, the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent semesters

9. Guidelines for Extension Activity (Part V)

- Atleast two activities should be conducted within this semester (IV) consisting of two days each.
- The activities may be Educating Rural Children, Unemployed Graduates, Self Help Group etc.

The marks may be awarded as follows

| No of Activities | Marks |
|---|-------|
| 2 x 50 (Each Activity for two days) | 100 |

10. QUESTION PAPER PATTERN FOR EE (Part III Theory Papers)

(3 HOURS TEST)

MAXIMUM: 75 Marks

SECTION - A (20 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(10 x 2 =20 marks)

TWO questions from each unit

SECTION - B (25 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 5 = 25 marks)

Either or Type.

ONE question from each unit with internal choice

SECTION - C (30 Marks)

Answer any THREE Questions out of FIVE questions

ALL Questions Carry EQUAL Marks

(3 x 10 =30 marks)

ONE question from each unit


| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU01 | PROGRAMMING WITH C | I |
| Objective: | On successful completion of this subject the students have the programming ability in C Language. | |
| Unit No. | Topics | Hours |
| Unit I | Overview of C: Importance of C–Basic structure of C Programs–Programming style–Executing a C Program– Constants, Variables and Data types: Character set - C Tokens – Keyword and Identifiers- Constants, Variables and Data types- Operators and Expressions: Types of Operators–Arithmetic Expressions–Evaluation of Expressions. | 12 |
| Unit II | Managing Input and Output operations: Reading and Writing a Character–Formatted I/O- Decision Making and Branching – Decision making with if statement – switch statement – Looping- while-do-for statement–Jumps in Loops. | 12 |
| Unit III | Arrays: Types of Array – Dynamic Array- Character Arrays and Strings – Reading strings from terminal–String Handling functions–Table of strings. User defined Functions – Elements–Function declaration – Category of function – Nesting of function - Recursion. | 12 |
| Unit IV | Structures and Unions: Array of structures – structures within structures- structures and functions. Union – size of structures - Bit fields. Pointers – Pointer expression – Pointers and Array–Pointer to function. | 12 |
| Unit V | File management in C: File operations–Dynamic memory allocation – Linked lists–MALLOC, CALLOC and RELLOC. Preprocessors – Macro substitution–Programming Guide lines. | 12 |

Text Book:


1. Balagurusamy E, "Programming in ANSI C", Tata McGraw-Hill, 4th edition.

Reference Books:

1. Byron S Gottfried, "Programming with C", Schaum's Outline Series – Tata McGraw Hill Publications.
2. Ashok N Kamthane, " Programming with ANSI and TURBO C", Pearson Education.
3. Henry Mullish, Huubert L Cooper, "The Spirit of C", Jaico Publications.


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| Code No. | Subject | Semester No. |
|-------------------|--|--------------|
| 16CAU02 | PRACTICAL I : PROGRAMMING LAB – C | I |
| Objective: | To identify, explore, and transfer new technologies that have the potential to substantially improve in C. | |
| Ex. No. | Program List | |
| 1 | Write a program to print first N prime numbers. | |
| 2 | Write a C program to generate Fibonacci series. | |
| 3 | Write a program to find number of palindromes in a given sentence | |
| 4 | Write a program to find greatest of three given numbers. | |
| 5 | Write a C program to count the number of Vowels in the given sentence. | |
| 6 | Write a C program to find the factorial of a given number using recursive function. | |
| 7 | Write a C program to sort the given set of numbers in ascending order. | |
| 8 | Write a function to swap two numbers using pointers | |
| 9 | Write a C program to Create a structure to store the following details: Roll no., Name, Mark1, Mark2, Mark3, Total, Average, Result and Class. Write a program to read Roll no., Name and three subject marks. Find out the total, result and class as Follows: a) Total is the addition of three Subject marks b) Result is pass if all subject marks greater than or equal to 40 else "Fail". c) Class will be awarded for students who have cleared 3 subjects i) Class "Distinction" if average ≥ 75 ii) Class "First" if average lies between 60 to 74. iii) Class "Second" if average lies between 50 & 59. | |
| 10 | Write a C program to Develop a pay slip for an employee using file with the fields Eno, Ename, Basic. Calculate DA= 32% of Basic. HRA = 15% of Basic. PF=15% of Basic And print all details with Net pay. | |
| 11 | Write a C program to copy the contents of one file into another file. | |
| 12 | Write a C program to find sum of numbers given in Command line arguments Recursively. | |


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| Code No. | Subject | Semester No. |
|-------------------|--|--------------|
| 16CAU03 | DIGITAL FUNDAMENTALS AND ARCHITECTURE | I |
| Objective: | On successful completion of this subject the students should have Knowledge on Digital circuits and Architecture and Interfacing of various Components. | |
| Unit No. | Topics | Hours |
| Unit I | Number System and codes: Introduction - Number System - Floating Point Representation of Numbers - Arithmetic Operation - 1's and 2's Complements: 1's Complement Subtraction - 2's Complement Subtraction. 9's Complement - 10's Complement - BCD. | 12 |
| Unit II | Boolean algebra, Minimization Techniques and Logic Gates: Introduction - Boolean Logic Operations - Basic Laws of Boolean Algebra - Demorgan's Theorems - Sum of Products and Product of Sums - Karnaugh Map. Logic Gates: OR Gate - AND Gate - NOT Gate - NAND Gate - NOR Gate. | 12 |
| Unit III | Arithmetic Circuits and Flip Flops: Introduction - Half Adder - Full Adder, Half Subtractor - Full Subtractor - Multiplexers - Demultiplexers - Decoders. Flip Flops: Types of Flip Flops - S-R Flip Flop - JK Flip Flop - T Flip Flop. Registers: Shift registers. | 12 |
| Unit IV | Input-Output Organization: Input-Output Interface - Asynchronous Data Transfer - Priority Interrupt: Daisy-Chaining Priority, Parallel Priority Interrupt. Direct Memory Access - Input - Output Processor: CPU-IOP Communication.. | 12 |
| Unit V | Memory Organization: Memory Hierarchy-Main Memory - Associative Memory - Cache Memory - Virtual Memory: Address Space and Memory Space- Address mapping using Pages- Associative memory Page Table. | 12 |

Text Book:

1. Salivahanan.S and Arivazhagan.S., "Digital Circuits and Design", Vikas Publishing House Pvt Ltd ,Third Edition., (UNIT - I,II,III)
2. M. Morris Mano, "Computer System Architecture", PHI.(UNIT - IV,V)

Reference Books:

1. V.K. Puri "Digital Electronics Circuits And Systems", TMH.
2. AHO,HOPCARFT, ULLMAN," The design and analysis of computer algorithms", Pearson Education.
3. Thomas C. Bartee," Digital Computer Fundamentals", 6th edition.

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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU04 | DATA STRUCTURES | I |
| Objective: | This subject provides a practical application using different tools and techniques in Data structure and algorithms. | |
| Unit No. | Topics | Hours |
| Unit I | Introduction: Introduction to Algorithm -Arrays and sequential representations – ordered lists – Stacks and Queues – Evaluation of Expressions -Singly Linked List – doubly linked list-Polynomial addition. | 10 |
| Unit II | Trees: Binary tree representations – Tree Traversal – Threaded Binary Trees -Counting binary trees. Graphs: Terminology and Representations - Traversals, Connected Components. | 10 |
| Unit III | Spanning trees: Biconnected components - Hashing: Introduction- Static Hashing-Dynamic Hashing. Symbol tables: Static tree table-Dynamic table. | 10 |
| Unit IV | Sorting: Internal sorting - Insertion sort-quick sort-heap sort-Merge sort-two way merge sort-sorting on several keys. External Sorting: Storage device- Magnetic tape – Disk storage - Sorting with disk- K-way merging - Sorting with tape. Searching: Binary search. | 09 |
| Unit V | Files: Files, Queries and Sequential organizations - Index Techniques- File Organizations - sequential organizations - Random Organization - Linked Organization - Inverted Files - Cellular Partitions - Storage Management. | 09 |

Textbook:

1. Ellis Horowitz, Sartaj Sahni and Sanguthevar, "Fundamentals of Data Structure", Galgotia Publications.

Reference Books:

1. Horowitz, Sahni, Anderson-freed, "Fundamentals of Data structures in C", Second edition, 2008.
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithms", Galgotia Publications, 2001.
3. A.V. Aho, John E.Hopcroft Jeffrey D. Ullman, "The Design and Analysis of Computer Algorithms", Pearson Education


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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU05 | PROGRAMMING WITH C++ | II |
| Objective: | To inculcate knowledge on Object-oriented programming concepts using C++ | |
| Unit No. | Topics | Hours |
| Unit I | Introduction to C++: Introduction to C++ - Key concepts of Object-Oriented Programming – Advantages- Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures : Decision Making and Statements If.. Else, jump, go to, break, continue and Switch case statements - Loops in C++: For, While, Do - Functions in C++ - Inline functions – Function Overloading. | 12 |
| Unit II | Classes , Objects and Constructor, Destructor: Classes and Objects: Declaring Objects – Defining Member Functions – Static Member variables and functions – Array of objects –Friend functions – Overloading member functions – Bit fields and classes – Constructor and Destructor with static members. | 12 |
| Unit III | Operator Overloading and Types of Inheritance : Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – Type conversion. Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchical, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes. | 12 |
| Unit IV | Array and Pointers: Pointers – Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – Array of classes – Memory models – New and Delete operators – Dynamic object – Binding , Polymorphism and Virtual functions. | 12 |
| Unit V | Files: Files – File stream classes – File modes – Sequential Read / Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling – String- Declaring and Initializing string objects – String Attributes – Miscellaneous functions. | 12 |

Text Book :

1. Ashok N Kamthane ,2003. "C++ Programming" Pearson Education publication.

Reference Books:


1. Balagurusamy, E.. "Object-Oriented Programming with C++" Tata Mc-Grawhill Publication,2003, 2nd Edition .
2. Maria Litvin & Gray Litvin , "C++ for you" Vikas publication, 2nd Edition .
3. John R Hubbart, "Programming in C++" , TMH Publications, 2002, 2nd Edition.



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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU06 | PRACTICAL II : PROGRAMMING LAB - C++ | II |
| Objective: | To inculcate knowledge on Object Oriented Programming concepts using C++. | |
| Ex. No. | Program List | |
| 1 | Write a C++ Program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable. Write a Member function ADD (), SUB (), MUL (), DIV () to perform addition, subtraction, multiplication, division respectively. Write a member function to get and display values. | |
| 2 | Write a C++ Program to find factorial of a given number using Copy constructor | |
| 3 | Write a C++ Program to read an integer number and find the sum of all the digits until it reduces to a single digit using constructors, destructors and inline member functions. | |
| 4 | Write a C++ Program for Banking Information system using FRIEND FUNCTION. | |
| 5 | Write a C++ Program using Function Overloading to read two Matrices of different Data Types such as integers and floating point numbers. Find out the sum of the above two matrices separately and display the sum of these arrays individually. | |
| 6 | Write a C++ Program to create a class STRING. Write a Member Function to initialize, get and display strings. Overload the Operator + to concatenate two Strings, == to compare two strings | |
| 7 | Write a C++ Program to create class, which consists of STUDENT detail like Student Number, Student Name, Department, Mark. Write a member function to get and display them. Derive a class RESULT from the above class and write a member function to calculate TOTAL, PERCENTAGE, and GRADE. Display the result of the student depending on the grade using Multi Level Inheritance. | |
| 8 | Write a C++ Program to create class which consists of EMPLOYEE detail like Employee Number, Employee Name, Department, Basic Salary and Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade using Multiple Inheritance. | |
| 9 | Write a C++ Program to create a class SHAPE which consists of two VIRTUAL FUNCTIONS to calculate area and perimeter of various figures. Derive three classes SQUARE, RECTANGLE, TRIANGLE from class Shape and Calculate Area and Perimeter of each class separately and display the result. | |
| 10 | Write a C++ program to perform Arithmetic operations using TEMPLATE. | |
| 11 | Write a C++ Program to perform multiple catch statements | |
| 12 | Write a C++ Program to merge two files into a single file. | |

| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU07 | PRACTICAL III :OFFICE AUTOMATION LAB | II |
| Objective: | To inculcate knowledge on MS-Office Tools like MS-Word, MS-Excel, MS-Access and MS-PowerPoint. | |
| Ex. No. | Program List | |
| | MS-WORD | |
| 1 | Create a business letter using Mail Merge. | |
| 2 | Prepare a newspaper using two column format (Page which includes Border, Background, Pictures, Header & Footer) | |
| 3 | Table of contents & Document Template | |
| | MS-EXCEL | |
| 4 | Analyze a sample sales Information system using Pivot Table & Pivot Chart. | |
| 5 | Prepare an employee Pay Slip and calculate the Net pay using the formula (BP: 8000, HRA: 12%, PF: 5%, DA: 2%, TA: 2.5%) | |
| 6 | Create the worksheet in MS-EXCEL to store the following information: Register Number, Name, Mark1, Mark2, Mark3, Total, and Average. <ul style="list-style-type: none"> a) Using formula and function find the total, average maximum, minimum total marks b) Sort the names in alphabetical order. c) Create the bar chart for average mark with proper titles and legends. | |
| | MS-ACCESS | |
| 7 | Create a database for Student Information System and create necessary Query, Forms and Reports. | |
| 8 | Create a database for Library Information System and create necessary Query, Forms and Reports. | |
| | MS-POWERPOINT | |
| 9 | Prepare 10 to 15 slides on any general topic with all necessary formats. | |
| 10 | Prepare 10 slides for an Advertisement company to exhibit its features. | |
| | INTERNET | |
| 11 | To create an E-mail ID (compose & send mail with attachment) | |
| 12 | To search using search engine, open and read newspaper sites, TV Schedules | |


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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU09 | SYSTEM SOFTWARE AND OPERATING SYSTEM | III |
| Objective: | To impart knowledge on various aspects of System Software and Operating System | |
| Unit No. | Topics | Hours |
| Unit I | Introduction: System Software and machine architecture –Assemblers – Basic Assembler functions – Machine dependent features – Program Relocation – Machine independent features –Literals – Symbol Defining statements – Expression – Program blocks – Control Sections and Program Linking – Assembler design options. | 15 |
| Unit II | Loaders and Linkers: Basic Loader functions – Machine dependent loader features – Relocation Program – Machine independent loader features - Loader options – Loader design options – linkage editor – dynamic linking – Bootstrap Loader | 15 |
| Unit III | Text Editors: Overview of editing process –user interface –editor structure. Machine dependent compiler feature: Intermediate form of the program – machine independent compiler features – compiler design options – division into passes – interpreters – P-code compilers. | 10 |
| Unit IV | Introduction: Definition of DOS – History of DOS –Definition of Process – Process states –Process state Transition – Interrupt Processing – Interrupt classes. Storage Management Real storage: Real storage management strategies – Contiguous Vs non-Contiguous storage allocation –Single user Contiguous storage allocation – Fixed Partition multiprogramming - Variable Partition multiprogramming. | 10 |
| Unit V | Virtual Storage: Virtual storage management strategies – Page replacement strategies – Demand Paging – Page size. Device and Information Management Disk Performance Optimization: Operation of moving head disk storage – Need for disk scheduling – Seek Optimization – FCFS –SSTF –SCAN – RAM Disks. | 10 |

Text Book :

1. Leland.L.Beck, "System Software: An introduction to System Programming", Pearson Education Publishers, Third Edition, 2003

Reference Books:

- 1 .Deitel H.M., "Operating System", Pearson Education Publishers, 2nd Edition, 2003
- 2 .Achyut .S.Godbole, "Operating System", TMH Publications, 2003.
- 3 Dhamdhrer, D.M., " Systems Programming and Operating System", 2nd Edition.


Head of the Department
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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU10 | JAVA PROGRAMMING | III |
| Objective: | To inculcate knowledge on java programming | |
| Unit No. | Topics | Hours |
| Unit I | Introduction to Java : Features of Java - Object Oriented Concepts – History of Java- Structure – Java Tokens – Statements – Java Virtual Machine - Data Types - Variables - Operators - Decision Making and Branching - Decision Making and Looping | 10 |
| Unit II | Object Oriented concepts: Classes, Objects and Methods: Methods & variables - Constructor-Overloading - Static members - Final Classes – Abstract method - Arrays, Strings and Vectors. – Interfaces: Multiple Inheritance – Extending interfaces-implementing interfaces. Packages: Putting Classes together-creating, accessing & using packages. | 15 |
| Unit III | Multithreaded Programming: Creating Threads -Extending Threads -Thread life cycle - Thread Exception- priority -implementing runnable interface. Managing Errors and Exceptions: Introduction - Exception handling – Exceptions - Multiple Catch statement - using finally statement– Applet Programming – Graphics Programming. | 10 |
| Unit IV | Files: Managing Input / Output Files in Java : Concepts of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive data Types – Random Access Files. | 10 |
| Unit V | Advanced concepts of Java: AWT Class and Controls: Introduction -AWT class - AWT controls- Labels, Buttons, CheckBox, List, TextField, TextArea – AWT managers and menus – Layout manager - MenuBar & Menus - Event handling by AWT components . Introduction: Java Bean - Socket Programming – Servlets - Java Server Pages, JDBC. | 15 |

Text Book:


1.E.Balagurusamy, "PROGRAMMING WITH JAVA – A PRIMER –", TMH, 3rd Edition..

Reference Books:

1.Patrick Naughton & Hebert Schildt , "THE COMPLETE REFERENCE JAVA 2" , TM., 3rd Editions.

2.John R.Hubbard, "PROGRAMMING WITH JAVA" TMH, 2nd Edition.

3.Xavier C, "Programming with JAVA 2", SciTech Publications (India) Pvt. Ltd.


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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU11 | PRACTICAL IV: JAVA PROGRAMMING LAB | III |
| Objective: | To identify and explore Applications and Applets using Java. | |
| Ex. No. | Program List | |
| 1 | Write the java program for the manipulation of string class. | |
| 2 | Write a java program to demonstrate overloading & overriding. | |
| 3 | Write a java program to implement the multiple inheritance using interfaces. | |
| 4 | Write a java program to demonstrate the use of packages. | |
| 5 | Write a java program to implement the concept of Multithreading. | |
| 6 | Write a java program to create an Exception and throw the exception. | |
| 7 | Write a java program to demonstrate Graphics and Applet class. | |
| 8 | Create a java program to create Frame, Textbox, List box and buttons using AWT. | |
| 9 | Write a java program to develop a menu using AWT. | |
| 10 | Write a java program to implement the concept of Applet & AWT. | |
| 11 | Write a java program to implement the concept of various events. | |
| 12 | Write a java program which open an existing file and append the text to that file | |



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| Code No. | Subject | Semester No. |
|-------------------|--|--------------|
| 16CAU12 | WEB TECHNOLOGY | III |
| Objective: | To inculcate knowledge in real time web designing. | |
| Unit No. | Topics | Hours |
| Unit I | Introduction to HTML: Markup Language –Editing HTML – Common Elements –Headers –Linking –Images –Special Characters & More Line Breaks –Unordered List –Nested & Ordered List –HTML Tables –Basic HTML Forms –Internal Linking –Creating & Using Image Maps –Frameset Elements. | 12 |
| Unit II | Cascading Style sheets: Introduction - Font attributes-Color and Background attributes-Text attributes – border attributes-Margin attributes –Related attributes-List attributes. Inline styles –Embedded Style Sheets –Conflicting Styles –Linking External Style Sheets –Positioning Elements –Backgrounds – Element Dimensions –Box Model & Text flow –Media Types–Building a CSS Drop Drown Menu - User Style Sheets. | 12 |
| Unit III | XML: Introduction – Features of XML – XML Support and Usage – Compatibility of XML with others – Structure of a XML Document – Common Errors – Structures in XML – Creating Document Type Declarations – Flow objects – length – working with Text and Font – Color and Background properties. | 12 |
| Unit IV | JAVASCRIPT : Introduction – Operators – Assignments – Comparisons – Reserved Word – Reserved by Java – Words to be avoided - Browsers to use – Software Requirement – Starting with JavaScript – Using Quotes – Using Alert – Functions – Eval function – Using Statements in JavaScript – Working with Objects – Properties – Browser Objects – Date Object – Math Object – String Object – Defining Objects. | 12 |
| Unit V | EVENT HANDLING IN JAVASCRIPT: Window events – Listing of program to create form – Event object –Event simulation – Working with Forms – Form elements – User Actions – Windows and Frames – Window object – Frame object – Document Object – Navigator Object – Screen Object - Math Object – JavaScript Objects. | 12 |

Text Book:

1. Deitel, Neito, *Internet and World Wide Web-How to program*, Pearson Education, 2008.
2. Jeffrey C. Jackson, *"Web Technologies--A Computer Science Perspective"*, Pearson Education, 2006.

Reference Books:

1. Ramesh Bangia, *"Web Technology"* published by Firewall media, First Edition – 2006.
2. Thomas A.Powell, *The Complete Reference HTML and XHTML*, Tata McGraw Hill, IV Edition, 2003.
3. *World Wide Web design with HTML – C.Xavier*, 2007, TMH.



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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU13 | PRACTICAL V: WEB TECHNOLOGY LAB | III |
| Objective: | To identify, explore, and transfer new technologies to build the real world applications using Web Technologies. | |
| Ex. No. | Program List | |
| 1 | Design a web page for a company using HTML formatting tags | |
| 2 | Design a web page for your department using Images | |
| 3 | Design a personal web page with hyperlink | |
| 4 | Design a web page for advertising a product using animation effect | |
| 5 | Design a web page using ordered list and unordered list for a product. | |
| 6 | Design a web page using tables which shows your bio-data | |
| 7 | Design a web page using frameset tag | |
| 8 | Design an XML document, which contains 10 users information, which takes User Id as an input and returns the user details by taking the user information from the XML document. | |
| 9 | Design a CD catalog formatted with Cascading Style Sheet. | |
| 10 | Write a program for creating Multiplication table using JavaScript | |
| 11 | Write a program for computing student mark list using JavaScript | |
| 12 | Write a program for text editor using JavaScript | |



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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU15 | VISUAL BASIC AND VC++ | IV |
| Objective: | To impart knowledge on Visual Basic design, environment and controls. | |
| Unit No. | Topics | Hours |
| Unit I | Introducing Visual Basic: Introduction- Event and Event Procedures – Object related concepts –VB program Development Process- VB Program Components – VB environment –Visual Basic Fundamentals: constants – Variables – Data Types and Declarations – Operators and Expressions – Program Comments. Branching and Looping Statements. | 14 |
| Unit II | Visual Basic control Fundamentals: Control tools – Generating Error Messages – Creating timed Events. Menus and Dialog Boxes: Building Drop-Down Menus – Pop-Up Menus – Dialog Boxes – MsgBox Function – The Input Box function. Procedures: Modules and Procedures – Sub Procedures – Event Procedures – Function Procedures – Scope. Arrays:- Dynamic Arrays -Control Arrays. | 14 |
| Unit III | VB Files: Data Files: Sequential Data Files – Random-Access Data files– Binary files. VB Database Programming: Introducing Data Tools: Data view Window-Query Designer-Data report-Data Environment-Creating Data Environment. Active Data Objects: ADO and OLE DB- ADO object model-Connecting to database-working with record set-Closing database connection. | 14 |
| Unit IV | VC++: Building Basic Application: Understanding The Application Types. Understanding VC++ Resources:- Wizard Supplied Resources-working with Accelerators and Menus- Working with Toolbars. MFC and Windows – MFC Fundamentals – MFS Class Hierarchy – MFC Member & Global Functions. Introducing Dialog Boxes:- Modal vs. Modeless- CDialog class. | 15 |
| Unit V | Using the Visual C++ App Wizard and Class Wizard: The MFC App Wizard-Basics of App Wizard- Support of Document View Architecture-MFC Class Wizard- Message Handler using Class Wizard. ADO versus ODBC: Understanding ODBC- Understanding ADO-VC++ ODBC and ADO classes. | 15 |

Text Book :

1. Eric a. smith, Valor Whisler, Hank Marquis, "Visual Basic 6 Programming Bible", Wiley India, 2009.
2. Byron S. Gottfried, "VISUAL BASIC" Schaum's Outline series, TMH.
3. Herbert Schildt, "MFC Programming From the Ground up", Second Edition , Tata McGraw-Hill

Reference Books:

1. Cornell. Visual Basic 6 from the Ground Up, Tata McGraw – Hill Company Ltd
2. Mveller, Visual C++ from the Ground up, TMCH.
3. Viktor Toth, —Visual C++6 Unleashed, Second Edition, Techmedia.


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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU16 | PRACTICAL VI : VISUAL BASIC AND VC++ LAB | IV |
| Objective: | To identify, explore, and transfer new technologies that have the potential to substantially improve in VB and VC++. | |
| Ex. No. | Program List | |
| 1 | VB Write a VB program to implement controls. | |
| 2 | Write a simple VB program to add the items to list box with user input and move the selected item to combo box one by one. | |
| 3 | Write a simple VB program to develop a calculator with basic operation. | |
| 4 | Design a form using common dialog control to display the font, save and open dialog box without using the action control property. | |
| 5 | Write a VB Program to develop a MDI window. | |
| 6 | Create a VB Program to validate username and password from the database and display the appropriate message. | |
| 7 | Write a VB program to design a Student Database with Register Number, Name, and Marks of various subjects, total and average with Back End as Microsoft Access. | |
| 8 | VC++ Write a VC++ Program to display Toolbar and Status bar. | |
| 9 | Write a VC++ Program to add, delete string in a list box. | |
| 10 | Write a VC++ Program to perform menu Editor. | |
| 11 | Write a VC++ Program to perform Free Hand Drawing | |
| 12 | Write a VC++ Program to perform serialization-SDI. | |



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| Code No. | Subject | Semester No. |
|-------------------|--|--------------|
| 16CAU17 | RELATIONAL DATABASE MANAGEMENT SYSTEM | IV |
| Objective: | To lay a strong foundation into the basic principles, theory and practice of using relational databases. | |
| Unit No. | Topics | Hours |
| Unit I | Purpose of Database: Overall System Structure - Entity Relationship Model - Mapping Constraints - Keys - E-R Diagrams. Data Storage and Querying Transaction Management. Database Architecture. | 14 |
| Unit II | Relational Model: Structure - Formal Query Language - Relational Algebra - Tuple and Domain Relational Calculus. | 14 |
| Unit III | Introduction to Oracle : Types of Databases, Relational Database properties. Structured Query Language - Basic Structure - Set Operations - Aggregate Functions - Date, Numeric, and Character Functions - Nested Sub queries - Modification Of Databases - Joined Relations-DDL - Embedded SQL. | 14 |
| Unit IV | Relational Database Design : Pitfalls - Normalization Using Functional Dependencies - First Normal Form-Second Normal Form-Third Normal Form Fourth Normal Form And BCNF. | 15 |
| Unit V | Introduction : SQL (DDL,DML, DCL Commands) – Integrity Constraints – PL/SQL – PL/SQL Block – procedure, function – Cursor management – Triggers – Exception Handling. | 15 |

Text Book:

1. Singh-Database systems: Concepts, Design & applications, Pearson Education
2. Database System Concepts, Fifth edition, Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill-2005.

Reference Books:

1. Abraham Silberschatz, H.F.Korth And S.Sudarshan-Database System Concepts Mcgraw Hill Publication
2. Gerald V.Post - DBMS-Designing And Business Applications - Mcgraw Hill Publications 4. Michael Abbey And Michael.J.Corey-Oracle- A Beginners guide TMH.
3. Nilesh Shah, "Database Systems using Oracle", 2002, Prentice Hall of India.


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| Code No. | Subject | Semester No. |
|-------------------|--|--------------|
| 16CAU18 | PRACTICAL VII :PROGRAMMING LAB-ORACLE | IV |
| Objective: | To identify, explore, and transfer new technologies that have the potential to substantially improve Oracle in various fields. | |
| Ex. No. | Program List | |
| 1 | Create a table for Student details with Registration Number as Primary Key and following fields: Name, Course, Gender, Age, Year of Joining and Percentage. Insert at least 10 rows and perform various queries using any one Comparison, Logical, Set, Sorting, and Grouping Operators. | |
| 2 | Create tables for a corporate management system which shows the use of primary and foreign key. The main table should have the following fields: Employee ID, Designation, Date of Joining, Date of Birth, Gender, Date of Transfer. Create a Report (Select Verb) with fields Employee ID, Gender, Date of Joining, and Date of Transfer with the Column Formats. | |
| 3 | Write a PL/SQL block to find out if a year is a leap year. A leap year is divisible by 4 but not by 100, or it is divisible by 400.(Hint: The function MOD(n,d) divides n by d and return the integer remainder from the operations). | |
| 4 | Write a trigger that is fixed before the DML statement's execution on the Employee table. The trigger checks the day based on the SYSDATE .If the day is Sunday the trigger does not allow the DML statements execution and raises an exception. Write the appropriate message in the exception handling section. | |
| 5 | Write a PL/SQL to divide the student's results table into three tables based on the results (One table for "Pass" and second one for "Average" and third one for "Fail"). Use a cursor for handling records of students table and create necessary fields for the table structure. | |
| 6 | Create a PL/SQL block to declare the cursor to select last name, first name, salary, and hire date from the EMPLOYEE table. Retrieve the rows from the cursor and get the employee's information if the salary is greater than Rs.50,000 and the hire date is before 31, December, 2015. | |
| 7 | Declare a PL/SQL record based on the structure of the DEPT table. Use a substitution variable to retrieve information about a specific department and store it in the PL/SQL record. View the record information. | |
| 8 | Write a trigger that is fires after an INSERT statement is executed for the student table. The trigger writes the new students ID, users name, and system update in a table called TRACKING.(Create tracking table). | |
| 9 | Create a database trigger to implement on the main and transaction tables which is related to the inventory system for checking the data validity with the tables having the needed fields. | |
| 10 | Write a PL/SQL program to create a table for a bank account and create and exception for managing the account where the account is said to be zero. | |


| Code No. | Subject | Semester No. |
|------------|---|--------------|
| 16CAU20 | SOFTWARE ENGINEERING | V |
| Objective: | To impart knowledge of Software Engineering | |
| Unit I | Software and Software Engineering: The Nature of Software - The Unique Nature of Web Apps-Software Engineering-The Software Process-Software Engineering Practice - Process Models : Defining a Framework Activity-Process Assessment And Improvement-Prescriptive Process Models | 15 |
| Unit II | Requirements Analysis: Scenario Based Models - Data Modeling Concepts - Class based Modeling – Requirement Modeling strategies – Flow oriented modeling - Creating a Behavioral Model - Requirements Modeling for Web Apps | 15 |
| Unit III | The Design Process: Software Quality guidelines and attributes – Evolution of Software design - Design Concepts - The Design Model - The Golden Rules - User Interface Analysis and Design - Interface Analysis. | 14 |
| Unit IV | Elements of Software Quality Assurance: Software Testing Strategies - Strategic Issues-Test Strategies for Conventional Software - Validation Testing - System Testing. Software testing Fundamentals-White-Box Testing - Basis Path Testing - Control Structure Testing-Black-Box Testing-Model-Based Testing. | 14 |
| Unit V | Basic Concepts : Project Scheduling-Reactive versus Proactive Risk Strategies-Software Risks-Risk Identification-Software Maintenance-Software Supportability-Reengineering- Software Reengineering-What Is SPI?-The CMMI | 14 |

Text Book:

1. Roger S Pressman - "Software Engineering a Practioner's Approach" 7th Edition, TMH.

Reference Books:

1. Waman S.Jawaddekar – "Software Engineering – Principles & Practice"- TMH.
2. Richard Fairly," Software Engineering Concepts",Tata McGraw Hil.
3. James F Peters and Witold Pedryez, "Software Engineering - An Engineering Approach", 2000.


 Head of the Department
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 Coimbatore - 641 011 Page 60 of 202

| Code No. | Subject | Semester No. |
|-----------|---|--------------|
| 16CAU21 | TCP/IP PROTOCOL SUITE | V |
| Objective | To impart knowledge of TCP/IP DESIGN AND IMPLEMENTATION | |
| Unit No. | Topics | Hours |
| Unit I | Introduction: A Brief History - Protocols & Standards-Standards Organizations-Internet Standards. The OSI Model & the TCP/IP Protocols Suite: TCP/IP Protocols Suite-Addressing. | 15 |
| Unit II | Underlying Technologies: Local Area Networks (LANS)-Point-To-Point WANS-Switched WANS-Connecting Devices. IP Address: Classful Addressing: Introduction-Classful Addressing-Other Issues-Sub netting And Super netting. | 15 |
| Unit III | IP Addresses: Classless Addressing- Sub netting: Finding the subnet mask – Finding the subnet address – Variable length subnets- Address Allocation. Delivery, Forwarding And Routing Of IP Packets: Delivery-Forwarding-Routing-Structure Of A Router. | 14 |
| Unit IV | Internet Protocol (IP): Datagram-Fragmentation-Options-Checksum-IP Package. User Datagram Protocol (UDP): Process-To-Process Communication-User Datagram-Checksum-UDP Operation. Transmission Control Protocol (TCP): TCP Services-TCP Features-Segment-A TCP Connection-State Transition Diagram-TCP Timers-TCP Package. | 14 |
| Unit V | Domain Name System (DNS): Namespace-Domain Namespace-Distribution of Namespace-DNS in the Internet-Resolution. Remote Login: TELNET: Concept-Network Virtual-NVT Character Set-Embedding-Options-Option Negotiation-Controlling the Server-Out-Of-Band Signaling-Mode Of Operation-User Interface-Security Issue. | 14 |

Text Book:


1.TCP/IP protocol suite, Behrouz A.Forouzan,3rd edition,TMH

Reference Books:

1.Douglas E. Comer – 'internetworking with TCP/IP Principles, protocols and Architecture",vol.1&2 fourth edition Pearson Education Asia,2003.

2.W.Richard Stevens "TCP/IP illustrated" volume 1 Pearson education,2003[unit 2]

3.Achyut S Godbole, "Data communications and Networks", TMH Publications, 2007.


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| Code No. | Subject | Semester No. |
|-------------------|--|--------------|
| 16CAU22 | COMPUTER GRAPHICS AND MULTIMEDIA | V |
| Objective: | To impart fundamental algorithms and techniques and gain knowledge and to understand the latest innovations in computer graphics. | |
| Unit No. | Topics | Hours |
| Unit I | Computer Graphics Basic Concepts: Introduction-Uses of Computer graphics -Display devices - CRT, Color CRT monitors-Direct view storage tube – Flat panel displays-Raster scan system, Random scan system, aspect ratio. Line drawing algorithm-simple DDA – Bresenham’s line drawing algorithm-circle generation. Attributes of Output primitives-line, area, curve, character. | 15 |
| Unit II | Two Dimensional Concepts: Basic transformation, Matrix Representation –Composite transformation, General pivot point rotation-fixed point scaling, other transformation.2D viewing-viewing transformation-Windowing transformation. Clipping operations-point clipping-Line clipping-Sutherland-Hodgeman polygon clipping-Text clipping. | 15 |
| Unit III | Three Dimensional Concepts: 3D display methods-3D dimensional transformation-3D viewing-Viewing pipeline-Viewing coordinates-Projections. Hidden surface removal-Object space method-Back face detection method-Painter’s algorithm-Image space methods-area subdivision –Octree-Depth buffer-Scan line-Ray tracing Surface renderings-Shading | 14 |
| Unit IV | MULTIMEDIA - Text and Image: Text-Introduction-Types of text Unicode Standards- Font-Insertion Text-Text Compression-File Formats. Image- Image types-color models-Basics steps for Image Processing-Image processing software. | 14 |
| Unit V | Audio and Video: Audio- Introduction-Elements of Audio system-MIDI. Video-Introduction- Analog Video Camera-Transmission of Video signals. Animations: Introductions-Uses of Animation-Types of Animation-Principles of Animations-Techniques of Animation. | 14 |

Text Book:

1. Donald Hearn & M.Pauline Baker "Computer Graphics-C version", Pearson Education, 2nd Edition
2. Ranjan Parekh "Principles of Multimedia", Tata McGraw-Hill companies.

Reference Books:

1. Amarendra N.Sinha, Arun D Udai, "Computer Graphics", Tata McGraw Hill Publishing Company, 2007
2. Judith Jeffcoate "Multimedia in Practice Technology and Application", PHI Publishers, 2002.
3. Ze-Nian Li, Mark S.Drew "Fundamentals of Multimedia", PHI Publishers, 2008.



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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU023 | PRACTICAL VIII : COMPUTER GRAPHICS AND MULTIMEDIA LAB | V |
| Objective: | To inculcate knowledge on Graphics and Multimedia concepts. | |
| Ex. No. | Program List | |
| | GRAPHICS | |
| 1 | Write a program to rotate an image | |
| 2 | Write a program to draw a line using DDA algorithm | |
| 3 | Write a program to bounce a ball and move it with sound effect | |
| 4 | Write a program to move a car with sound effect | |
| 5 | Write a program to test whether a given pixel is inside or outside or on a polygon | |
| | PHOTOSHOP | |
| 6 | Animate a plane flying in the clouds using Photoshop | |
| 7 | Convert Black and white photo to color photo | |
| 8 | Create Web page using Photoshop | |
| | FLASH | |
| 9 | Change a shape from one form to another form using flash | |
| 10 | Draw a parrot with various tools available in flash and make it to fly with key frame animation | |
| 11 | Create a box and make it to rotate in 3 dimensions with the help of shape animation using flash | |
| 12 | Create a simple game with the help of action script | |



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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU24 | ELECTIVE 1 : DATA MINING AND WAREHOUSING | V |
| Objective: | To know the basic concepts of Data Mining and Data Warehousing | |
| Unit No. | Topics | Hours |
| Unit I | Data Mining –Introduction: Basic Data Mining Tasks-Data Mining versus Knowledge Discovery in Databases – Data Mining Issues – Data Mining Metrics – Social Implications of Data Mining – Data Mining from a Database Perspective | 14 |
| Unit II | Classification Techniques: Classification – Introduction – Statistical-Based Algorithms – Distance-Based Algorithm – Decision Tree-Based Algorithm - Neural Network –Based Algorithm – Rule – Based Algorithm – Combining Techniques. | 14 |
| Unit III | Clustering Techniques: Clustering – Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithm –Partitional Algorithm – Clustering Large Databases – BIRCH – DBSCAN – CURE Algorithm. | 14 |
| Unit IV | Association Rule Mining: Association Rules – Introduction – Large Item sets – Basic Algorithm – Parallel and Distributed Algorithm – Comparing Approaches – Incremental Rules – Advanced Association Rule Techniques – Measuring the Quality of Rules | 15 |
| Unit V | Data Warehouse : An introduction – characteristics of Data Warehouse – Data Marts – Other Aspects of Data Marts. Introduction – OLTP and OLAP systems – Data modeling – Star schema for multidimensional view – Multifact star schema or snow flake schema – Case Studies: Data warehousing in the TamilNadu Government. Data Warehousing for the Ministry of Commerce. | 15 |

Text Book:

1. Margaret H.Dunham, "Data Mining: Introductory and Advance Topics", Pearson Education.

Reference Books:

1. C.S.R.Prabhu, "Data warehousing: Concepts, Techniques, Products and Applications", PHI Publishers, 3rd Edition, 2009.
2. Arun.k.Pujari. "Data Mining Techniques", University Press, 2nd Edition, 2009.
3. Paul Raj Poonia, "Fundamentals of Data Warehousing", John Wiley & Sons, 2003.



Head of the Department
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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU24 | ELECTIVE 1: COMPUTER INSTALLATION AND SERVICES | V |
| Objective: | On Successful Completion of this subject the students should have a thorough knowledge on the different components of the computer and how to install the various hardware devices. | |
| Unit No. | Topics | Hours |
| Unit I | Pc System: Evolution of PC to Pentium, Personal Computer System - Functional Blocks-System Unit-Display Unit-Keybaord. Inside PC: Motherboard Functional Blocks, BIOS: BIOS services-BIOS interaction, CMOSRAM, Motherboard types-Processors: CISC processor-RISC processor-Pentium Processor-CYRIX processor-AMD processor, Chipset. | 14 |
| Unit II | On-Board Memory: PC's Memory Organization: DRAM - SDRAM – FPM DRAM -EDO DRAM - DDR SDRAM –DR DRAM – Cache – Virtual, Memory-Memory packaging: SIMM, DIMM, RIMM, I/O Ports: Serial – Parallel – USB – Game Port. External Memory: Floppy Disk: Floppy Disk Drive - Floppy Disk Controller - Hard Disk: Hard Disk Drive Sub Assemblies-Hard Disk Controller, MMX: CD-ROM Disk-CD-ROM Drive-DVD-Sound Blaster-Video on Pc. | 14 |
| Unit III | Input Devices and Output Devices: Keyboard-Mouse-Scanner-Digitizer-Digital Camera. Output Devices: Monitors and Adapters: CRT-VGA –Display Controllers – Digital Display Technology – CRT Controller – Graphic Cards, Printers : Dot Matrix Printer – Plotters – Laser Printers – Inkjet Printers | 14 |
| Unit IV | Computer Installation: Room Preparation – Power supply – PC Installation. Troubleshooting and Services: POST – Troubleshooting the Motherboard - Troubleshooting the Keyboard - Troubleshooting the FDD/HDD - Troubleshooting the Printer | 15 |
| Unit V | Computer Maintenance: Diagnostic software: CHECK IT – Microsoft Diagnostic – Norton Utilities – QA Plus – ATDIAGS.Data Security: Computer Virus – Virus Prevention Techniques – Antivirus Software Packages – Firewalls Computers and Communications: Networking: LAN-WAN-Network Component, MODEM – Interrupt. | 15 |

Text Book:


1. *Computer Installation and Servicing, Second Edition by Balasubramaniam.D. Tata McGraw-Hill, 2005.*

Reference Books:

1. *Computer Installation and Troubleshooting- M.Radhakrishnan ISTE- Learning Materials 2001*

2. *IBM PC and CLONES - B.Govindrajalu Tata McGraw-Hill Publishers.*

3. *D.Balasubramanian, "Computer Installation and servicing", Tata McGraw-Hill Education (India) Pvt Ltd, 2nd Edition, 2005.*


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Coimbatore-65 612028.


| Code No. | Subject | Semester No. |
|------------|---|--------------|
| 16CAU25 | SOFTWARE TESTING | VI |
| Objective: | To develop the skill of software testing. Knowledge on software testing and how to test the software at various levels. To inculcate knowledge on Software testing concepts. | |
| Unit No. | Topics | Hours |
| Unit I | Introduction to Testing: Briefly history of Testing - Testing opportunities - Testing principles, Software Development Life Cycle Models: Waterfall Model - Fish Bone Model - Spiral Model - RAD Model-Prototype Model - Phases of software project - Software quality - Quality Assurance - Quality Control - Difference between QA & QC. | 14 |
| Unit II | Software Testing Definition: Verification – Validation – Static testing – Dynamic Testing – Difference between verification and validation - Difference between static testing and Dynamic testing. Testing Techniques: Boundary value Analysis – Equivalent class partition - Test Design: Test Methodology – Test Scenarios – Test cases – Test Template – Types of Test Cases – Difference between Test Scenario and Test Case – Creating Manual Test case design for Sample Application. | 14 |
| Unit III | Testing Types: Black-Box testing-What is Black-Box testing? – Why Black-Box testing? – When to do Black-Box testing? – How to do Black-Box testing? - White-Box testing – Challenges in White-Box Testing – Unit Testing – Integration Testing: Integration Testing as type of testing – Integration testing as a Phase Testing - Gray-Box testing – Alpha Testing – Beta Testing – Glass-Box Testing. | 14 |
| Unit IV | System and Acceptance Testing: System Testing Overview – Why System testing is done? – Functional Testing - Non-Functional Testing - Functional versus Non-Functional Testing – Acceptance Testing – Summary of Testing Phases. Test Planning, Management, Execution and Reporting. | 15 |
| Unit V | Performance Testing: Factors governing Performance Testing – Methodology of Performance Testing – Tools for Performance Testing – Process for Performance Testing – Challenges. Regression Testing: What is Regression Testing? – Types of Regression Testing – When to do Regression Test? –How to do Regression Testing? – Best Practices in Regression Testing. | 15 |

Text Book:

1. *Software Testing Principles and Practices* – Srinivasan Desikan & Gopalswamy Ramesh, 2006, Pearson Education.
2. Boris Beizer, "Software Testing Techniques", Van Nostrand Reinhold.

Reference Books:

1. Renu Rajani, Pradeep Oak, "Software Testing. – Effective Methods, Tools & Techniques" – Tata McGraw Hill.
2. "Software Project Management", Bob Hughes & Mike Cotterell, 4th Ed, PHI.
3. Gopalswamy Ramesh, "Managing Global Software Projects", TMH, 2002.


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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU26 | PRACTICAL IX : ST & SPM LAB | VI |
| Objective: | Knowledge on how to Test the Applications Using Automation test. To inculcate knowledge on Software is testing & SPM Programming concepts. | |
| Ex No. | Program List | |
| | SOFTWARE TESTING LAB: AUTOMATION TOOL:WINRUNNER | |
| 1 | Perform Synchronization point test using Flight Reservation Application | |
| 2 | Create a software test case to perform TSL programming for Flight Reservation Application | |
| 3 | Develop a test case to implement the GUI object properties Test for the Flight Reservation Application | |
| 4 | Write a test case to perform Bitmap check points for Flight Reservation Application | |
| 5 | Write a test case to perform Database check points for Student Information Application | |
| 6 | Develop a test case to implement Data Driven Test | |
| | SOFTWARE PROJECT MANAGEMENT LAB | |
| 1 | Using any of the CASE tools, Practice requirement analysis and specification for different firms. | |
| 2 | Practice function oriented design. | |
| 3 | Practice creating software documentation for the Analysis phase of software development life cycle for a real time application. | |
| 4 | Practice creating software documentation for the Development phase of software development life cycle for a real time application. | |
| 5 | Practice creating software documentation for the Implementation phase of software development life cycle for a real time application. | |
| 6 | Practice creating software documentation for the Testing phase of software development life cycle for a real time application. | |


| Code No. | Subject | Semester No. |
|-------------------|--|--------------|
| 16CAU27 | PHP and ASP.Net | VI |
| Objective: | To impart knowledge on web programming using PHP and ASP.net. | |
| Unit No. | Topics | Hours |
| Unit I | Introduction: Introduction – getting PHP – Creating Development Environment-Creating & running a PHP page – combining PHP and html- printing text & html – Comments in PHP – Variables & Constants – Internal date types. Operators: PHP operators – Precedence. Conditional & Looping: If, else, else if, switch. Loop: for, while, do....while, for each. | 14 |
| Unit II | String Functions: Formatting text string-building arrays – deleting arrays- Array functions – array operators. Function: Creating functions – passing data to function- passing array to function – passing by reference- returning data from function. Variable scope in PHP – accessing global data – conditional & variable functions. | 14 |
| Unit III | Database: Introduction to SQL – creating MySQL database – creating a new table – accessing database in PHP – inserting and updating data to database – deleting records – sorting data. | 14 |
| Unit IV | Asp.net: Introduction to web development - Introduction to asp.net - page frame work- HTML server control - web control. .Net framework- CLR-Common type system -.net framework class Library- IDE environment- application state –session state-view state. | 15 |
| Unit V | Controls: Label – textbox –list box –dropdown list –view control- tree view control –sitemap path control –creating static menu –dynamic menu – ad rotator control –xml control. Validation Controls : Required Field Validators - Comparison Validators - Range Validators - Regular Expression Validators - Custom Validators- Validation Summary. User controls –Events –Cascading style sheets –ASP.net applications. | 15 |

Text Book:

1. Steven Holzner, "The Complete Reference - PHP", Tata McGraw Hill Education.
2. Asp.Net Black Book, Dream Tech Press, third edition, 2009.

Reference Books:

1. Matt Doyle – Beginning PHP 5.3, Wiley India pvt. Ltd, First edition, 2010.
2. Vikram Vaswani - PHP: A beginners guide, Tata McGraw Hill, First edition, 2010
3. Paul Gibbs, "Programming with PHP/MYSQL", 2015.


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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU28 | PRACTICAL X: PHP and ASP.Net Lab | VI |
| Objective: | To inculcate knowledge in various techniques using PHP and ASP .net. | |
| Ex. No. | Program List | |
| 1 | Write a PHP program to check whether a person is eligible to vote. | |
| 2 | Write a PHP program to convert Dollars to Rupees. | |
| 3 | Develop a PHP program using controls and functions | |
| 4 | Develop a PHP program using String function and Arrays | |
| 5 | Develop a PHP program for Date and time functions | |
| 6 | Write an asp.net program to create a login form | |
| 7 | Write an asp.net program to perform validation control. | |
| 8 | Write an asp.net to design a web page. | |
| 9 | Develop a window application to process student marks (using basic controls). | |
| 10 | Develop a window application to process for employee payroll system. (Using basic controls) | |



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| Code No. | Subject | Semester No. |
|-------------------|--|--------------|
| 16CAU29 | ELECTIVE 2 : MOBILE COMPUTING | VI |
| Objective: | To provide an in depth understanding in the field of mobile computing and mobile Communication technology and Applications. | |
| Unit No. | Topics | Hours |
| Unit I | Introduction: Wireless the Beginning- Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and services. Mobile Computing Architecture: Architecture for mobile computing –Three tier architecture- Mobile computing through Internet- Design consideration for mobile computing. | 14 |
| Unit II | Mobile Computing Through Telephony: Evaluation of Telephony – Multiple access procedures – Mobile computing through telephone –TAPI. Bluetooth-RFID-WiMAX-Mobile IP-Java Card. | 14 |
| Unit III | Emerging Technologies: GSM: Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM– GSM Addresses and Identifiers – Network Aspects in GSM –SMS Architecture-SMMT-SMMO-Authentications and Security. SMS: Mobile computing over SMS | 14 |
| Unit IV | GPRS: GPRS – GPRS and packet data network – GPRS network architecture – GPRS network operations – Data services in GPRS – Applications for GPRS – Limitations – Billing and Charging-GPRS Applications. WAP: WAP- MMS. | 15 |
| Unit V | CDMA and 3G: Spread spectrum technology – CDMA vs GSM – Wireless Data – Third generation networks – Applications on 3G WIRELESS LAN: Wireless LAN advantages – IEEE 802.11 standards – Architecture – Mobile in Wireless LAN – Deploying wireless LAN – Mobile adhoc networks and sensor Wi-Fi vs. 3G.Wireless LAN Security- WIFI versus 3G. | 15 |

Text Book:

1. Asoke K Talukder, Roopa R Yavagal "Mobile Computing", Tata McGraw Hill, 2005.

Reference Books:

1. Prashant Kumar Patra, Sanjit Kumar Dash "Mobile Computing", SciTech publication, PVT, LTD.
2. Jochen Schiller, "Mobile Communication", Pearson Education, Second Edition.
3. Sajne, "Mobile Computing Technology, Application and Service Creation", 2nd Edition, Tata McGraw Hill Pub.2010


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| Code No. | Subject | Semester No. |
|-------------------|---|--------------|
| 16CAU29 | ELECTIVE 2 : Client Server | VI |
| Objective: | To impart knowledge on various aspects of Client Server concepts. | |
| Unit No. | Topics | Hours |
| Unit I | Introduction: Introduction to client/server Computing: Main frame centric client/server computing - Downsizing and client/server computing -Preserving Mainframe applications Investment through porting -Client/Server development tools -Advantages of Client/Server computing. | 14 |
| Unit II | Components Of Client/Server Applications: The Client: The role of the Client -Client services, Request for services, RPC, windows services, Fax/print services, Remote boot services, other remote services- Utility services and other services, Dynamic data exchange, Object linking and embedding. Common object request broker architecture. | 14 |
| Unit III | Components Of Client/Server Applications: The Server: The role of the Server- server functionality in detail: File services-Database services-communication services -The network operating system -Novell network -LAN manager -IBM LAN server-Banyan VINES-PC network file services – The Server operating systems: Netware, OS/2, Windows NT Unix-system application architecture (SAA). | 14 |
| Unit IV | Components Of Client/Server Applications: Connectivity: Open Systems Interconnect (OSI) -Inter Process Communication (IPC) - Wide area network technology - Client/server development software: Need for Platform migration and reengineering of existing systems -Hardware components. | 15 |
| Unit V | Application Development Tools: GUI front end to 3270/5250 screens -The prototype process -Application development -Workbench architecture -Information Engineering facility Architecture -EASEL Workbench -Ellipse -SQL Windows -Power builder-SQL Tool set. APT workbench component. | 15 |

Text Book:

1. Patrick Smith Steve Guengerich, "Client/Server Computing", 2nd Edition-PHI 2011.
2. Dawna Travis Dewire, "Client/Server computing" - McGraw hill.

Reference Books:

1. Robert Orfali, Dan Harley, Jeri Edward, "The essential client/server survival guide", second edition.
2. Beth gold-Bernstein, David Marca, "Designing enterprise client/server systems".
3. Thomas S Ligon, "Client/Server communications", McGraw Hill series on client/server computing.

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