

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

COIMBATORE - 641 028

B.Sc. COMPUTER SCIENCE

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							
16CEU01	Digital Fundamentals and Architecture	4	3	25	75	100	3
16CEU02	Programming with C	5	3	25	75	100	4
16CEU03	Data Structures	5	3	25	75	100	4
16CEU04	Practical I : Programming Lab – C	4	3	40	60	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							
16CEU05	Programming with C++	6	3	25	75	100	5
16CEU06	Practical II : Programming Lab - C++	5	3	40	60	100	3
16CEU07	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							
16CEU08	Operating System	6	3	25	75	100	5
16CEU09	Java Programming	6	3	25	75	100	5
16CEU10	Software Engineering and Software Project Management	6	3	25	75	100	5

16CEU11	Practical III: Programming Lab - JAVA	5	3	40	60	100	3
16CEU12	Allied : Mathematical Structures(MAT)	5	3	25	75	100	3
	Part - IV						
16GSU02	Environmental Studies	2	-	100	-	100	2
Fourth Semester							
	Part – III						
16CEU13	Relational Database Management System	6	3	25	75	100	5
16CEU14	Visual Programming - Visual Basic & Visual C++	6	3	25	75	100	5
16CEU15	Practical IV : Visual Programming - VB & VC++	5	3	40	60	100	3
16CEU16	Practical V : Programming Lab - ORACLE	5	3	40	60	100	3
16CEU17	Allied: Business Accounting(COM)	6	3	25	75	100	5
	Part - IV						
16GSU03	Skill Based: Internet Security	2	-	100	-	100	2
	Part - V						
16GSU04	Extension Activity	-	-	100	-	100	2
Fifth Semester							
	Part – III						
16CEU18	Computer Networks	6	3	25	75	100	5
16CEU19	Graphics & Multimedia	6	3	25	75	100	5
16CEU20	Artificial Intelligence & Expert Systems	6	3	25	75	100	5
16CEU21	Practical VI: Programming Lab - Graphics & Multimedia	6	3	40	60	100	4
16CEU22	Elective - I (a) Management Information System (OR) (b) Computer Installation and Service	6	3	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						
16CEU23	Data Mining and Warehousing	6	3	25	75	100	5
16CEU24	Open Source Tools	6	3	25	75	100	5
16CEU25	Software Testing	6	3	25	75	100	5
16CEU26	Practical VII : Programming Lab - ST & SPM	6	3	40	60	100	4
16CEU27	Elective - II (a) Compiler Design (OR) (b) Network Security	6	3	25	75	100	4
16CEU28	Project Work	-	-	40	60	100	4
							141

REGULATIONS

Components for Evaluation:

1. 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 I.E Model Examination

(3 HOURS TEST)

MAXIMUM: 75 Marks

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

(3 x 10 = 30 marks)

ONE question from each unit

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

Institutional/Industrial Training		Mini Project	Major Project Work	
Components	Marks	Marks	Components	Marks
I.E			I. E	
Work Diary	25	-	a) Attendance 10 Marks	
Report	50	50	b) Review /	40
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)

*² Evaluation 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.
16CEU01	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.	10
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.	10
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.	10
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..	09
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.	09

Text Books:

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

Reference Books:

1. Puri V.K, "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.
16CEU02	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, New Delhi.
2. Yashavant P. Kanetkar, "Pointers in C", BPB Publications 2003.
3. Henry Mullish, Huubert L Cooper, "The Spirit of C", Jaico Publications.

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Code no.	Subject	Semester No.
16CEU03	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.	12
Unit II	Trees: Binary tree representations – Tree Traversal – Threaded Binary Trees -Counting binary trees. Graphs: Terminology and Representations - Traversals, Connected Components.	12
Unit III	Spanning trees: Biconnected components - Hashing: Introduction- Static Hashing-Dynamic Hashing. Symbol tables: Static tree table-Dynamic table.	12
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.	12
Unit V	Files: Files, Queries and Sequential organizations - Index Techniques- File Organizations-sequential organizations-Random Organization-Linked Organization-Inverted Files-Cellular Partitions - Storage Management.	12

Text book:

1. Ellis Horowitz, Sartaj Sahni and Sanguthevar, "Fundamentals of Data Structure", Galgotia Publications 1999.

Reference Books:

1. Horowitz, Sahni, Anderson-freed, "Fundamentals of Data structures in C", Galgotia Publications Second edition, 2008.
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Fundamentals of Computer Algorithms", Galgotia Publications, 2001.
3. Narashimha Karumanchi, "Data Structures and Algorithms Made Easy", Career Monk Publications, Second Edition.



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Code No.	Subject	Semester No.
16CEU04	PRACTICAL I: PROGRAMMING LAB - C	I
Objective:	This subject provides a practical application using different tools and techniques in C program. On successful completion of this subject the students should have knowledge about the C techniques and their applicability to solve the real world problems	
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.	<p>Write a C program to Create a structure to store the following details:</p> <p>Rollo. Name, Mark1, Mark2, Mark3, Total, Average, Result and Class. Write a program to read Rollo. Name and three subject marks. Find out the total, result and class as follows:</p> <p>a) Total is the addition of three Subject marks</p> <p>b) Result is pass if all subject marks greater than or equal to 40 else "Fail".</p> <p>c) Class will be awarded for students who have cleared 3 subjects</p> <p>i) Class "Distinction" if average ≥ 75</p> <p>ii) Class "First" if average lies between 60 to 74.</p> <p>iii) Class "Second" if average lies between 50 & 59.</p>	
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 Netpay.	
11.	Write a C program to copy 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.
16CEU05	PROGRAMMING WITH C++	II
Objective:	This course provides in-depth coverage of Object Oriented Programming principles and techniques using C++. Topics include Classes, Overloading, Data Abstraction, Information Hiding, Encapsulation, Inheritance and Polymorphism, File Processing, Templates and Exceptions.	
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.	15
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.	15
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.	14
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 function.	14
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.	14

Text Book:

1. Ashok N Kamthane , "C++ PROGRAMMING" Pearson Education publication, 2013.

Reference Books:

1. Balagurusamy, E. "Object-Oriented Programming with C++", Tata McGraw-Hill Publications. 4th Edition, 2009.
2. Maria Litvin & Gray Litvin, "C++ for you" Vikas publication, 2nd Edition, 2003.
3. John R Hubbard, "Programming in C++" TMH Publications, 2nd Edition, 2002.


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Code No.	Subject	Semester No.
16CEU06	PRACTICAL II : PROGRAMMING LAB – C++	II
Objective:	This subject provides a Practical Application using different tools and techniques in C++ program. On successful completion of this subject the students should have knowledge about the C++ techniques and their applicability to solve the real world problems	
Ex. No.	Program List	
1.	Develop 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.	Develop a C++ Program to find factorial of a given number using Copy constructor.	
3.	Develop 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.	Develop a C++ Program for Banking Information system using FRIEND FUNCTION.	
5.	Develop 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.	Develop 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.	Develop a C++ Program to create class, which consists of STUDENT detail. 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.	Develop a C++ Program to create class which consists of EMPLOYEE detail. 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.	Develop 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.	Develop a C++ program to perform Arithmetic operations using TEMPLATE.	
11.	Develop a C++ Program to perform multiple catch statements.	
12.	Develop a C++ Program to merge two files into a single file.	



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Code No.	Subject	Semester No.
16CEU08	OPERATING SYSTEM	III
Objective:	On successful completion of this subject, the students should have known about different types of Operating System and its memory.	
Unit No.	Topics	Hours
Unit I	Introduction to operating system: Introduction - Mainframe systems - Desktop Systems - Multiprocessor Systems - Distributed Systems - Clustered Systems - Real Time Systems - Handheld Systems - System Components - Operating System Services - System Programs - Process Concept - Process Scheduling - Operations on Processes - Cooperating Processes - Inter-process Communication	15
Unit II	Scheduling in operating system: Scheduling- Threads - Overview - Threading issues - CPU Scheduling - Basic Concepts - Scheduling Criteria - Scheduling Algorithms - Multiple-Processor Scheduling - Real Time Scheduling - The Critical-Section Problem - Semaphores - Critical regions - Monitors.	14
Unit III	Memory Allocation: System Model - Deadlock Characterization - Methods for handling Deadlocks - Deadlock Prevention - Deadlock detection - Recovery from Deadlocks - Storage Management - Swapping - Contiguous Memory allocation - Paging - Segmentation - Segmentation with Paging.	14
Unit IV	Memory Management: Virtual Memory - Demand Paging - Process creation - Page Replacement - Allocation of frames - Thrashing - File Concept - Access Methods - Directory Structure - File Sharing - Protection	14
Unit V	File Structure: File System Structure - File System Implementation - Directory Implementation - Allocation Methods - Free-space Management. Kernel I/O Subsystems - Disk Structure - Disk Scheduling- Disk Management - Swap-Space Management. Case Study: The Linux System, Windows	15

Text Book:

1. Harvey M. Deitel, "Operating System", Pearson Education Pvt. Ltd, Second Edition, 2002.

Reference Books:

1. William Stallings, "Operating System", Prentice Hall of India, 4th Edition, 2003.
2. Dhamdhrer, "Systems Programming and Operating System", TM 2nd Edition Revised.
3. Achyut S. Godbole, "Operating system", TMH Publishing.


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Code No.	Subject	Semester No.
16CEU09	JAVA PROGRAMMING	III
Objective:	To inculcate knowledge on Java programming concept such as Multithreading, AWT, Servlets and Beans	
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	14
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 & Exception Handling: 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.	15
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.	14
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 - Java Bean - Socket Programming – Servlets - Java Server Pages, JDBC.	14

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.
16CEU10	SOFTWARE ENGINEERING AND SOFTWARE PROJECT MANAGEMENT	III
Objective:	To learn the concept of Designing the Software in Software concerns.	
Unit No.	Topics	Hours
Unit I	Software Process: Introduction -S/W Engineering Paradigm - life cycle models - water fall, incremental, spiral, evolutionary, prototyping, object oriented - system engineering - computer based system - verification - validation - life cycle process - development process -system engineering hierarchy	14
Unit II	Software Requirements: Functional and non-functional - user - system - requirement engineering process - feasibility studies - requirements - validation and management - software prototyping - prototyping in the software process - rapid prototyping techniques - user interface prototyping - S/W document.	14
Unit III	Design Concepts And Principles: Design process and concepts - modular design - design heuristic - design model and document. Architectural design - software architecture - data design - architectural design - transform and transaction mapping - user interface design - user interface design principles. Real time systems - Real time software design - system design - real time executives - monitoring and control system.	15
Unit IV	Testing: Software testing - levels - test activities - types of s/w test - black box testing - testing boundary conditions - structural testing - test coverage criteria based on data flow mechanisms - regression testing - testing in the large. S/W testing strategies - strategic approach and issues - unit testing - integration tests - validation tests - system testing and debugging.	14
Unit V	Software Project Management: Measures and measurements - S/W complexity and science measure - size measure - data and logic structure measure - information flow measure. Software cost estimation - function point models - COCOMO model- Delphi method.- Defining a Task Network - Scheduling - Earned Value Analysis - Error Tracking - Software changes - program evolution dynamics - software maintenance - Architectural evolution - Taxonomy of CASE tools.	15

Text Book:

1. Roger S.Pressman and James F Peters and Witold Pedryez, "Software Engineering", McGraw-Hill International Edition, 6th edition, 2004.

Reference Books:

1. James F Peters and Witold Pedryez, "Software Engineering - An Engineering Approach", New Delhi, 2000.
2. Gopaldaswamy Ramesh, "Managing Global Software Projects", TMH, New Delhi, 2002.
3. Bob Hughes, Mike Cotterell, "Software Project Management", TMH, New Delhi, 2nd Edition 2002.


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Code No.	Subject	Semester No.
16CEU11	PRACTICAL III : PROGRAMMING LAB – JAVA	III
Objective:	This subject provides a practical application using different tools and techniques in Java program. On successful completion of this subject, the students should have knowledge about the Java techniques and their applicability to solve the real world problems.	
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.
16CEU13	RELATIONAL DATABASE MANAGEMENT SYSTEM	IV
Objective:	To lay a Strong Foundation into the Basic Principles, Theory and Practice of using Relational Database. To emphasize the Need, Role, Importance and Uses of Databases in Applications development. To distinguish between different models of Organizing, Storing and use of data	
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.	15
Unit IV	Relational Database Design: Pitfalls - Normalization Using Functional Dependencies - First Normal Form-Second Normal Form-Third Normal Form Fourth Normal Form And BCNF.	14
Unit V	Introduction PL/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.

Reference Books:

1. Raghu Ramakrishnan and Johannes Gehrke, " Database Management Systems", McGraw-Hill Education, 2003.
2. Nilesh Shah, "Database system using Oracle", PHI Learning Private Limited, 2nd edition.
3. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database System Concepts", McGraw-Hill, Fifth edition, 2005.


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Code No.	Subject	Semester No.
16CEU14	VISUAL PROGRAMMING – VISUAL BASIC & VISUAL C++	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 – Message Box 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.	15
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.	14

Text Books:

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", Tata McGrawHill, Second Edition,

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", Techmedia., Second Edition.


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Code No.	Subject	Semester No.
16CEU15	PRACTICAL IV : VISUAL PROGRAMMING – VB & VC++	IV
Objective:	To Identify, Explore, and Transfer new Technologies that have the potential to substantially improve Visual Basic in various fields.	
Ex. No.	Program List	
Visual Basic		
1.	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.	
Visual C++		
1.	Write a VC++ Program to display Toolbar and Status bar.	
2.	Write a VC++ Program to add, delete string in a list box.	
3.	Write a VC++ Program to perform menu Editor.	
4.	Write a VC++ Program to perform Free Hand Drawing.	
5.	Write a VC++ Program to perform serialization-SDI.	



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Code No.	Subject	Semester No.
16CEU16	PRACTICAL V: PROGRAMMING LAB – ORACLE	IV
Objective:	To identify, Explore, and Transfer new Technologies that has 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 students 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 an exception for managing the account where the account is said to be zero.	



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Code No.	Subject	Semester No.
16CEU18	COMPUTER NETWORKS	V
Objective:	On successful completion of the course the students should have, Understood the use of Computer Networks and the Functions of Network Layers. This course presents the Introduction to Computer Networks, the Physical layer, Data link layer, Network layer, Session layer.	
Unit No.	Topics	Hours
Unit I	Introduction: Use of computer networks: Business Applications – Home Applications – Mobile Users. Network Hardware: LAN – WAN – MAN – Wireless – Home Networks. Network Software: Protocol Hierarchies – Design Issues – Connection Oriented and Connectionless Services. References Models: OSI Reference Model – TCP/IP Reference Model – Comparison of OSI and TCP/IP - Critique of OSI Protocols – Critique of TCP/IP Reference Model.	14
Unit II	Physical Layer: Guided Transmission Media: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. Wireless Transmission: Electromagnetic Spectrum – Radio Transmission - Microwave Transmission – Infrared and Millimeter Waves – Light Waves. Communication Satellites: Geo- Stationery Satellites – Medium Earth Orbit Satellites – Low Earth Orbit Satellites – Satellites versus Fiber - Public Switched Telephone System – Structure of Telephone System.	14
Unit III	Data Link Layer: Data Link Layer Design Issues – Services Provided To The Network Layer – Framing. Error Detection and Correction: Error Detecting Codes – Error Correcting Codes. Elementary Data Link Protocols: Unrestricted Simplex Protocol – Simplex Stop and Wait Protocol – Simplex Protocol For Noisy Channel. Sliding Window Protocol 1 -Bit Sliding Window Protocol.	14
Unit IV	Network Layer: Design Issues: Store And Forward Packet Switching – Services Provided To The Transport Layer – Implementation Of Connectionless Service – Implementation Of Connection Oriented Service – Comparison Of Virtual Circuit And Datagram Subnets. Routing Algorithms: Optimality Principle – Shortest Path Routing – Flooding – Distance Vector Routing – Link State Routing – Hierarchical Routing - Broadcast Routing – Multicast Routing - Distant Vector Routing.	15
Unit V	Transport Layer: Services Provided To The Upper Layers – Transport Service Primitives – Elements Of Transport Protocols – Addressing – Connection Establishment And Connection Release. DNS (The Domain Name System): The DNS Name Space – Resource Records – Name Servers. APPLICATION LAYER: DNS – Email. NETWORK SECURITY: Cryptography – Symmetric Key Algorithms – Public Key Algorithms – Digital Signatures.	15

Text Book:


1. Andrew S. Tanenbaum, "Computer Networks", Prentice hall India Pub, Fourth Edition, 2005.

Reference Books:

1. Douglas E Comer, "Computer Networks & Internets with Internet Applications", Pearson Education, 4th Edition, 2008.

2. William Stallings, "Data and computer communications", PHI, seventh edition, 2000.

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


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Code No.	Subject	Semester No.
16CEU19	GRAPHICS & 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	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.	14
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	15
Unit IV	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 Books:

1. Donald Hearn & M.Pauline Baker "Computer Graphics-C version", Pearson Education, 2nd Edition.
2. Ranjan Parekh, "Principles of Multimedia", Tata McGrawHill 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.
16CEU20	ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS	V
Objective:	To have enriched knowledge regarding Heuristic Search, Knowledge Representation and Expert System.	
Unit No.	Topics	Hours
Unit I	Introduction to AI: Introduction - AI Problems – AI techniques – Criteria for success. Problems, Problem Spaces, Search: State space search – Production Systems – Problem Characteristics – Issues in design of Search.	14
Unit II	Heuristic Search techniques: Generate and Test – Hill Climbing – Best-First, Problem Reduction, Constraint Satisfaction, Means-end analysis.	14
Unit III	Knowledge representation issues: Representations and mappings – Approaches to Knowledge representations – Issues in Knowledge representations – Frame Problem.	14
Unit IV	Using Predicate Logic: Representing simple facts in logic – Representing Instance and Isa relationships – Computable functions and predicates – Resolution – Natural deduction. Planning: Overview – Components of a planning system.	15
Unit V	Representing knowledge using rules: Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge .Brief explanation of Expert Systems – Definition – Characteristics – architecture – Knowledge Engineering – Expert System Life Cycle.	15

Text Book:


1. Elaine rich and Kelvin Knight, "Artificial Intelligence", Tata McGraw hill Publication, 2nd Edition, 1991. (Chapters 1- 6).

Reference Books:

1. Stuart Russell & Peter Norvig, "Artificial Intelligence a modern Approach", Pearson Education, 2nd Edition.
2. Saeed B Niku, " Introduction to robotics", Pearson Education, New Delhi 2003.
3. George F Luger, "Artificial Intelligence", , Pearson Edition Publication , 4th Edition, 2002.


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Code No.	Subject	Semester No.
16CEU21	PRACTICAL VI: PROGRAMMING LAB - GRAPHICS & MULTIMEDIA	V
Objective:	This subject provides a Practical Application using different Tools and Techniques in Computer Graphics program. On successful completion of this subject the students should have knowledge about the Graphics Techniques and their Applicability to solve the real world problems.	
Ex. No.	Program List	
	GRAPHICS	
1	Write a C program to rotate an image.	
2	Write a C program to draw a line using DDA algorithm.	
3	Write a C program to bounce a ball and move it with sound effect.	
4	Write a C program to move a car with sound effect.	
5	Write a C 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.
16CEU22	ELECTIVE I: MANAGEMENT INFORMATION SYSTEM	V
Objective:	To learn the concept of Designing the Software in Software concerns.	
Unit No.	Topics	Hours
Unit I	Information System and Organization: - Introduction to MIS - Concept, Definition, Role, Impact, Importance, MIS and Uses. Approaches to management, Functions of Manager, Manager and the environment, Management as a control System.	14
Unit II	Representation And Analysis of System Structure: Models for Representing Systems - Mathematical, Graphical and Hierarchical (Organization Chart, Tree Diagram) - Information Flow - Process Flow - Methods and Heuristics - Decomposition and Aggregation - Information Architecture - Application of System Representation to Case Studies	15
Unit III	System, Information and Decision Theory: Information Theory - Information Content and Redundancy - Classification and Compression - Summarizing and Filtering - Inferences and Uncertainty - Identifying Information needed to Support Decision Making - Human Factors - Problem characteristics and Information System Capabilities in Decision Making.	14
Unit IV	Information System Application: Transaction Processing Applications - Basic Accounting Application - Applications for Budgeting and Planning - Other use of Information Technology: Automation - Word Processing -Electronic Mail - Evaluation Remote Conferencing and Graphics - System and Selection - Cost Benefit - Centralized versus Decentralized Allocation Mechanism	15
Unit V	System development life cycle: Limitation - End User Development - Managing End Users - off- the shelf software packages - Outsourcing - Comparison of different methodologies	14

Text Book:


1. W. S. Jawadekar, "Management Information System", Tata Mcgraw hill.

Reference Books:

1. Turban E.F, Potter R.E, "Introduction to Information Technology"; Wiley, 2004.

2. Gopalswamy Ramesh, "Managing Global Software Projects", TMH, New Delhi, 2002.

3 James F Peters and Witold Pedryez, "Software Engineering - An Engineering Approach", New Delhi, 2000.


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Code No.	Subject	Semester No.
16CEU22	ELECTIVE I: COMPUTER INSTALLATION AND SERVICE	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.	15
Unit III	Input 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	14
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. D.Balasubramaniam, "Computer Installation and Servicing", , Tata McGraw-Hill, Second Edition, 2005.

Reference Books:

1. M.Radhakrishnan, " Computer Installation and Troubleshooting", ISTE- Learning Materials 2001.
2. B.Govind rajalu, "IBM PC and CLONES", Tata McGraw hill Publishers.
3. James K.L, "Computer Hardware: Installation, Interfacing, Troubleshooting and Maintenance", BH Science.


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Code No.	Subject	Semester No.
16CEU23	DATA MINING AND WAREHOUSING	VI
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	15
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	14
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 Tamil Nadu Government. Data Warehousing for the Ministry of Commerce.	15

Text Book:

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

Reference Books:

1 C.S.R.Prabhu, "Data warehousing: Concepts, Techniques, Products and Applications", PHI Publishers, Edition, 2009. (For Unit V).

2. Arun.k.Pujari. "Data Mining Techniques", University Press, 2nd Edition, 2009.

3. Kamber and Han, "Data Mining Concepts and Techniques", Hartcourt India, Ltd, 2001.



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Code No.	Subject	Semester No.
16CEU24	OPEN SOURCE TOOLS	VI
Objective:	To impart knowledge regarding open source concepts incorporating the operating system, front end tool and a back end tool.	
Unit No.	Topics	Hours
Unit I	Introduction to open source: Open source software – The Web - Structural Data – Serving Up Static Data – Serving Up Dynamic Data – Serving up Content With Embedded HTML – Security.	14
Unit II	Linux operating system: Introduction about Linux – Linux Distributions : Download & Install – Decisions – Linux Partition Sizes – Accounts – Security - Basic Unix - Shell – Owners, Group, Permission, Ownership – Processes – Path and Environment – Commands	14
Unit III	Apache: Introduction about Apache – Start, Stop and restart Apache Service – configuration – Modifying Default Configuration – Modifying Default Configuration - Securing Apache - Set User and Group - access – Create a simple Website .	15
Unit IV	MySQL database: Introduction about MySQL– Data Definition Language - Data Manipulation Language – Integrating PHP and MySQL – Performing Database Queries – Integrating Web forms and Databases	15
Unit V	Server script: Introduction about PHP – Server Side Scripting Overview – PHP Syntax and Variables – PHP Control Structures and Functions – Passing Information with PHP – String Handling.	14

Text Book:

1. Steve Suehring Tim Converse and Joyce Park, "PHP6 and MySQL Bible", Wiley-India. New Delhi 2009.

Reference Books:

1. Dacie Cristian, "Pack Pub AJAX and PHP" - 2006 .
2. Scouarnec Yann, Stolz Jeremy Jeremy and Glass Michael, "Beginning PHP5, APACHE, MYSQL Web Development", Wiley-India. New Delhi, 2005.
3. Steven Holzner, "The Complete Reference", Tata McGraw Hill Edition, NewDelhi, 2009.



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Code No.	Subject	Semester No.
16CEU25	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.	15
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.	15
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.	14
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.	14

Text Books:


1. Srinivasan Desikan & Gopalswamy Ramesh, "Software Testing Principles and Practices", Pearson Educatio,2006.
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. Bob Hughes & Mike Cotterell , "Software Project Management", PHI, 4th edition.
3. William E Perry, "Effective Methods of Software Testing", Wiley India, 3rd Edition.


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Code No.	Subject	Semester No.
16CEU26	PRACTICAL VII: PROGRAMMING LAB - ST & SPM	VI
Objective:	Knowledge on how to Test the Applications Using Automation test. To inculcate knowledge on Software 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 a function oriented design in software development process.	
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.	


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Code No.	Subject	Semester No.
16CEU27	ELECTIVE II : COMPILER DESIGN	VI
Objective:	To enrich the knowledge in various phases of Compiler and its use, Code Optimization Techniques, Machine Code Generation, and use of Symbol Table.	
Unit No.	Topics	Hours
Unit I	Introduction to compiler: Introduction to compiler – Analysis of source program-The Phases of compiler – cousins of compilers – The grouping of phases-compiler construction aols. Lexical analysis- Incorporating a symbol table – The role of lexical analyzer Generator – optimization of DFA	15
Unit II	Syntax Analysis: The role of a parser – context Free Grammar – access point - down parsing- Recursive Descent parsing – predictive parsing – Bottom up parsing- shift reduce parsing – Operator precedence parsing – LR parsing.	14
Unit III	Syntax: Syntax – directed translation: Syntax- directed definition – construction of syntax trees – Bottom –up evaluation of S – attributes definition –AP down translation –Recursive evaluate – Type checking – Type system- Specification of a simple type checker – Type conversion – An algorithm for unification. Intermediate language – Declaration – Assignment Statements- Boolean Expression- Case statement – Back patching – procedure calls.	15
Unit IV	Issues in Design: Issues in the design of code generate- The target machine – Run time storage management – Basics Blocks and Flow Graphs – A simple code generator- DAG representation of Basic blocks – Optimization	14
Unit V	Principle of source optimization: Introduction – principle source of optimization – optimization of basic blocks – Introduction a global data flow analysis –Runtime Environment –source Language issues-Storage organization-parameter passing.	14

Text Book:

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, "Compilers Principles, Techniques and Tools", Pearson Education Asia, 2003.

Reference Books:

1. Raghavan, "Introduction to Compilers", Tata McGraw-Hill, 2008.
2. AA Puntambekar, "Compiler Construction", Technical Publication
3. R.K. Maurya, Anand A. Godbole., "System Programming And Compiler Construction", DreamTech Publication.


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Code No.	Subject	Semester No.
16CEU27	ELECTIVE II : NETWORK SECURITY	VI
Objective:	On successful completion of this subject the students should have known about the different types of Network Security.	
Unit No.	Topics	Hours
Unit I	Introduction to Security: Security attacks, Security services and mechanism-model for network security-classical Encryption techniques - Symmetric cipher model - Substitution techniques-Transposition techniques & Steganography.	15
Unit II	Principles Of Modern Symmetric Ciphers: Block cipher principles - feistel cipher structure – DES - Encryption & Decryption, Differential & linear crypt analysis - AES.	15
Unit III	Public key encryption: Public key cryptography & RSA-Basics of number theory - RSA algorithm - key management - Diffe Hellman key exchange - Elliptic curve cryptography	14
Unit IV	Message Authentication & Hash function: Authentication requirements – Authentication function- message Authentication codes - Hash function & security of hash function of MACs.	14
Unit V	System Level Security: Intrusion detection - password management - Viruses and related Threats - Virus Counter measures - Firewall Design Principles - Trusted Systems.	14

Text Book:

1. Dhiren R.Patel , "Information Security", Theory and Practice, PHI 2008.

Reference Books:

1. Roberta Bragg, Mark Rhodes – Ousley, keithstrassberg, "Network Security", The Complete reference, Tata McGraw Hill Edition, 2007.
2. William Stallings, "Cryptography and Network Security: Principles and Practices". PHI Education, Asia, 4th Edition.
3. Atul Kahate, "Cryptography and Network Security", TMH. 2nd Edition.



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