

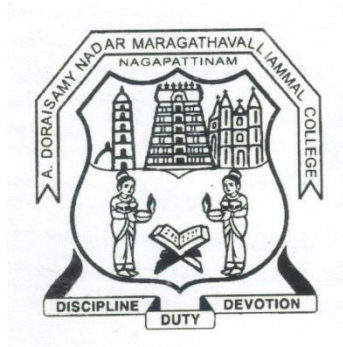
A.D.M COLLEGE FOR WOMEN (AUTONOMOUS),

NAGAPATTINAM-611 001

(Nationally Re-accredited with 'A' Grade by NAAC- 3rd Cycle)

PG DEPARTMENT OF COMPUTER SCIENCE

(for the candidates admitted from the academic year 2019-2022)



BCA

SYLLABUS

A.D.M. COLLEGE FOR WOMEN (AUTONOMOUS), NAGAPATTINAM
BCA Degree Programme

(Applicable to the candidates admitted from the academic year 2019 -2022)

PROGRAMME OBJECTIVES

1. To impart knowledge in advanced concepts and applications in different fields of computer Science.
2. To prepare students to enter into professional courses.
3. To educate students to occupy important positions in Softwares, MNCs and Industries.
4. To equip students with skills to excel in their future careers.
5. To prepare students to enter Masters Programme like M.Sc.,(Computer Science),M.Sc., (Information Technology) and pursue professional programmes like M.C.A. etc.
6. To enable students to take up challenging jobs.

BCA 2019 – 2022

STRUCTURE OF THE PROGRAMME

Part	Title of the Part	No. of Papers	Hours	Credit
I	Language - Tamil	4	24	12
II	English	4	24	12
III	Core Course	15	71	63
	Allied	6	27	18
	Major Based Elective	3	17	17
IV	Skill Based Elective	3	6	6
	Non-Major Elective	2	4	4
V	Extension Activities	0	0	1
	Value Education	1	2	2
	Environmental Studies	1	2	2
	Soft-Skill Development	1	2	2
	Gender Studies	1	1	1
	Total	41	180	140

Passing Minimum

A candidate shall be declared to have passed in each course if she secures not less than 40% marks out of 75 marks (i.e., 30 marks) in the End Semester Examination (SE) and 40% out of 25 marks (i.e., 10 marks) in the Continuous Internal Assessment.(CIA)

A.D.M. COLLEGE FOR WOMEN(AUTONOMOUS), NAGAPATTINAM
DEPARTMENT OF COMPUTER SCIENCE

BCA

Course Structure under CBCS
(for the candidates admitted from the academic year 2019-2022)

SEM	PART	COURSE	TITLE	INST HOUR/ WEEK	CREDIT	EXAM HOURS	MARKS		TOTAL
							CIA	SE	
I	I	Language Tamil(LC)	Tamil	6	3	3	25	75	100
	II	Language English(ECL)	English	6	3	3	25	75	100
	III	Core course-I (CC)	C Programming	5	4	3	25	75	100
		Core course-II (CC)	Programming in C lab	3	3	3	40	60	100
		Core course-III (CC)	Office Automation Lab	2	2	3	40	60	100
		I Allied Course I	Mathematics -I	6	3	3	25	75	100
V	Value Education	Value Education	2	2	3	25	75	100	
		Total		30	20	*	*	*	700
II	I	Language Tamil	Tamil	6	3	3	25	75	100
	II	Language English	English	6	3	3	25	75	100
	III	Core Course-IV(CC)	Object Oriented Programming using C++	4	4	3	25	75	100
		Core Course-V(CC)	Programming in C++ Lab	4	4	3	40	60	100
		I Allied Course II- (AC)	Elements of Accounting	3	3	3	25	75	100
		I Allied Course III- (AC)	Mathematics - II	5	3	3	25	75	100
V	Environmental Studies		2	2	3	25	75	100	
		Total		30	22	*	*	*	700

SEM	PART	COURSE	TITLE	INST HOUR/WEEK	CREDIT	EXAM HOURS	MARKS		TOTAL
							CIA	SE	
III	I	Language Tamil(LC)	Tamil	6	3	3	25	75	100
	II	Language English(ELC)	English	6	3	3	25	75	100
	III	Core course-VI(CC)	Java Programming	6	5	3	25	75	100
		Core course-VII (CC)	Java Programming Lab	4	4	3	40	60	100
		II Allied course-I (AC)	Mathematics - III	6	3	3	25	75	100
	IV	Non-Major Elective- I (NME)	Multimedia Lab	2	2	3	40	60	100
		Total		30	20	*	*	*	600
IV	I	Language Tamil (LC)	Tamil	6	3	3	25	75	100
	II	Language English (ELC)	English	6	3	3	25	75	100
	III	Core Course VIII(CC)	Data Structures and Algorithm	5	5	3	25	75	100
		Core Course IX(CC)	Data Structures using C++ Lab	2	2	3	40	60	100
		II Allied Course II (AC)	Financial Management	4	3	3	25	75	100
		II Allied Course III (AC)	Tally Lab	3	3	3	40	60	100
	IV	Non Major-Elective II (NME)	HTML Lab	2	2	3	40	60	100
		Skill Based Course I	HTML AND CSS Lab	2	2	3	40	60	100
		Total		30	23	*	*	*	700

SEM	PART	COURSE	TITLE	INST HOUR/ WEEK	CREDIT	EXAM HOURS	MARKS		TOTAL
							CIA	SE	
V	III	Core Course-X(CC)	Mobile Computing	6	5	3	25	75	100
		Core Course-XI(CC)	Operating Systems	6	5	3	25	75	100
		Core course-XII(CC)	Software Engineering	6	5	3	25	75	100
		Major Based Elective Course-I (MBE)	1.Computer Graphics 2.Programming in PHP	6	6	3	25	75	100
	IV	Skill Based Course II	Computer Graphics and Animation Lab	2	2	3	40	60	100
		Skill Based Course III	Android Lab	2	2	3	40	60	100
	V		Soft Skill Development	2	2	3	25	75	100
			Total		30	27			800
	VI		Core Course-XIII (CC)	Database Systems	6	5	3	25	75
		Core Course-XIV (CC)	Database Systems Lab	6	5	3	25	75	100
		Core course-XV(CC)	Project	6	5	3	25	75	100
		Major Based Elective Course-II (MBE)	1.Cloud Computing 2. Client/Server Computing	5	5	3	40	60	100
		Major Based Elective Course-III (MBE)	1.Python Programming 2. Dot net Programming	6	6	3	40	60	100
		Extension Activities		-	1				
		Gender Studies		1	1	3	25	75	100
		Total		30	28			600	
		Grand Total		180	140			4100	

Allied I	Allied II
Mathematics	Commerce & Management

Skill Based Courses Offered

- HTML AND CSS Lab
- Computer Graphics and Animation Lab
- Android Lab
- Web Programming with PHP & MYSQL Lab
- Mobile Computing
- The Script Language

Department of Computer Science

Mark Allocation for Theory Papers

CIA	-	25 Marks
External	-	<u>75 Marks</u>
		<u>100 Marks</u>

CIA Component

Test	-	10 Marks
Assignment	-	2 Marks
Seminar	-	3 Marks
Quiz/Group Discussion	-	5 Marks
Attendance	-	<u>5 Marks</u>
		<u>25 Marks</u>

Pattern of question Paper (Theory)

Section – A	10 x 2	= 20 Marks	(No Choice)
Section – B	5 x 5	= 25 Marks	(Either or)
Section – C	3 x 10	= <u>30 Marks</u>	(Any three out of 5)
Total		<u>75 Marks</u>	

**PG Department of Computer Science
Practical Question Pattern
(for BCA & NME Students)**

Internal: 40

Total Marks: 100

External: 60

Time : 3 Hrs

ANSWER ALL THE QUESTIONS:

1. -----
2. -----

Record -10 Marks

Program 1- 25 Marks

Program 2- 25 Marks

PG DEPARTMENT OF COMPUTER SCIENCE
(for the candidates admitted from the academic year 2019-2022)

BCA

PROGRAMME OUTCOMES

- PO1** Academic Excellence: Academic excellence through effective delivery of course contents
- PO2** Goal-Oriented and Life-Long Education: Setting short term, medium, and long term goals and achieving them in a global competitive perspective.
- PO3** Social Consciousness : Develop committed and socially responsible individuals and help them take up active and positive roles in society
- PO4** Technical Knowledge: To find, utilize and create content using information technologies and the internet.
- PO5** Entrepreneurial Development: They would develop business acumen, analytical skills, financial literacy necessary to appreciate the dynamic nature of commerce and industry
- PO6** Research and practical knowledge: Using research knowledge and aptitude acquired in the course of study for solving problems and face modern day challenges
- PO7** Project Work and Viva: To help them develop the ability to participate in academic discussions.

PROGRAMME SPECIFIC OUTCOMES

- PS0 1** Acquire skill and information not only about computer and information technology but also in organization and management
- PS0 2** Prepare student for roles pertaining to computer applications and IT industry
- PS0 3** Develop programming skills, networking skills, learn applications, packages, programming languages and modern techniques of IT
- PS0 4** Learn programming language such as Java, C++, HTML, SQL, Dotnet, etc...
- PS0 5** Prepare the learners to get placed in reputed organisations
- PS0 6** Provide information about various computer applications and latest development in IT and communication system
- PSO 7** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
- PSO 8** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

CORE COURSE – I (CC) C PROGRAMMING

Internal	: 25	Semester	: I
External	: 75	No. of Hours/Week	: 5
Exam Hours	: 3	Credit	: 4

Course Objectives:

- To obtain knowledge about the structure of the programming language C
- To develop the program writing and logical thinking skill.
- To impart the knowledge about pointers which is the backbone of effective memory handling
- To study the advantages of user defined data type which provides flexibility for application development
- To teach the basics of preprocessors available with C compiler.

UNIT I FUNDAMENTALS OF PROGRAMMING

Computer Basics- Algorithms – Simple Model of a Computer – Characteristics of Computers-Problem Solving Using Computers – Flow Chart – The Working of a Computer.

Introduction To C Language: Identifiers, Keywords, Constants, Variables and data types, Access Modifiers, Data Type Conversions- Operators- Conditional Controls - Loop Controls.

(Content – 12 Hrs, Assessment-3 Hrs)

(15 Hrs)

UNIT II ARRAYS

One Dimensional Array - Two Dimensional Array – Character Arrays and Strings.

Function: Introduction - Elements of User Defined Function - Definition of Functions - Return Values and their Types – Function Calls - Function Declaration - Category of Function - Nesting of Function - Recursion - Passing Arrays to Function - Passing Strings to Function – The Scope, Visibility and Lifetime of Variables - Library functions.

(Content – 12 Hrs, Assessment-3 Hrs)

(15 Hrs)

UNIT III STRUCTURES AND UNIONS

Defining Structure - Declaring Structure Variable - Accessing Structure Members - Structure Initialization - Arrays of Structure - Arrays within Structures - Structures within Structures - Structures and Function - Union.

(Content – 12 Hrs, Assessment-3 Hrs)

(15 Hrs)

UNIT IV POINTERS

Pointers - Declaration of Pointers - Accessing Variables through Pointers - Chain of Pointers - Pointer Expressions- Pointer Increments - Pointers with Arrays, Strings- Array of Pointers - Pointers with Functions - Pointers with Structures.

(Content – 12 Hrs, Assessment-3 Hrs)

(15 Hrs)

UNIT V FILE MANAGEMENT IN C

Defining and Opening a File - Closing a File - Input / Output Operations on Files - Error Handling During I/O Operations - Random Access to Files - Command Line Arguments - Dynamic Memory Allocation.

(Content – 12 Hrs, Assessment-3 Hrs)

(15 Hrs)

Text Books:

1. V. Rajaraman, “Fundamentals of Computer “,Asoke k.Ghosh Publications, PHI Learning Limited, 5th Ed., New Delhi,2011. UNIT I(A)
2. E. Balagurusamy, “Programming in C”, Tata McGraw Hill, 7th Ed., New Delhi, 2016. UNIT I (B) to UNIT V.

Reference Books:

1. Byron S. Gottfried, “Programming with C”, Tata McGraw Hill, 3rd Ed., New Delhi, 2010.
2. YashvantKanetkar, “Working with C”, BPB Publication, New Delhi, 2008.

Web-Resources:

<https://www.w3schools.in/c-tutorial/>

<https://nptel.ac.in/courses/106104128/>

Course Outcomes:

On completion of the Course, Students should be able to

- Understand the basic terminology of algorithm, flowchart and gain awareness used in computer programming.
- Design programs involving the various concepts like decision structures, loops, functions of C language.
- Demonstrate the single, multi-dimensional arrays, String functions and user defined functions.
- Compare the structure and union of C and apply it to construct array of structures and structure function.
- Understand the dynamics of memory by the use of pointers and pointers with functions.
- Comprehend the Processing of sequential and random access file concepts.

CORE COURSE – II (CC)
PROGRAMMING IN C LAB

Internal	:40	Semester	:I
External	:60	No. of Hours/Week	:3
Exam Hours	: 3	Credit	:3

Course Objectives:

- To develop skills in implementing algorithms through the programming Language C
- To explore the features of C by applying sample problems.
- The students will be able to enhance their analyzing and problem solving skills
- To learn problem solving techniques.
- To teach the student to write programs in C and to solve the problems.

List of Practicals:

1. a) Program to find Simple Interest
b) Program to calculate area of rectangle, square and triangle c) Program to find whether the given number is odd or even
2. a) Program to find the roots of a quadratic equation using if ... else statement
b) Program to find the biggest of 3 given numbers using nested if ... else statement
3. a) Program to find sum of individual digits of a given number using while statement
b) Program to find the sum of odd numbers between 1 and 100 using do ... while statement.
c) Program to find the sum and average of the given 'n' numbers using for loop
4. a) Program to find the factorial of the given number using recursive function
b) Program to calculate the binomial coefficient.
5. a) Program to sort the given set of numbers
b) Program to perform the addition of two given matrices.
c) Program to perform the multiplication of two given matrices.
6. a) Program to check whether the given string is palindrome or not.
b) Program to arrange the given set of names in alphabetical order.
7. a) Program to illustrate the use of pointers in arithmetic operations
b) Program to compute the sum of all elements stored in an array using pointers.
c) Program to swap the two values using pointers
8. Program to prepare mark sheet using file

Course Outcomes:

On completion of the Course, Students should be able to

- Understanding a functional hierarchical code organization.
- Ability to define and manage data structures based on problem subject domain.
- Ability to work with textual information, characters and strings.
- Ability to work with arrays of complex objects.
- Understanding a concept of object thinking within the framework of functional model.
- Understanding a concept of functional hierarchical code organization.
- Understanding a defensive programming concept. Ability to handle possible errors during program execution.

CORE COURSE III OFFICE AUTOMATION LAB

Internal	:40	Semester	:I
External	:60	No. of Hours/Week	:2
Exam Hours	: 3	Credit	:2

Course Objectives:

- Office tools course would enable the students in crafting professional word documents, excel spread sheets, power point presentations using the Microsoft suite of office tools.
- Give students an in-depth understanding of why computers are essential components in business, education and society.
- Provide foundational or “computer literacy” curriculum that prepares students for life-long learning of computer concepts and skills.
- To acquire knowledge on editor, spread sheet and presentation software.
- To train them to work on the comment based activities in MS-office system.

MS-WORD

1. Text Manipulation – Change the font size and type, Aligning and Justification of text, Underlining the text, indenting the text
 - a) Prepare a Bio-data
 - b) Prepare a letter
2. Using Bullets and Numbering in Paragraphs, Footer and Header, Finding and Replacing Text and Checking Spelling
 - a) Prepare any document
 - b) Prepare any document in newspaper format
3. Tables and Manipulations – Creation, Insertion and Deletion (Rows and Columns) and Usage of Auto Format
 - a) Create a Mark sheet and find total mark, average and result
 - b) Create a calendar and Auto Format it.
4. Picture Insertion and Alignment - Prepare a handout
5. Using Mail Merge
 - a) Prepare a business letter
 - b) Prepare an invitation

MS-EXCEL

1. Usage of Formulae and Built-in Functions.
2. Editing Cells and Using Commands and Functions
3. Moving and Copying, Inserting and Deleting Rows and Columns
4. Paybill Preparation

MS-POWERPOINT

Preparation and Manipulation of Slides

Course Outcomes:

On completion of the Course, Students should be able to

- To perform documentation activities
- To execute accounting operations
- To enhance presentation skills
- To work on Document Management Systems
- Format Text, Paragraphs, and sections
- To Create and manage documents

CORE COURSE – IV (CC)

OBJECT ORIENTED PROGRAMMING USING C++

Internal Marks	: 25	Semester	:II
External Marks	:75	No. of Hours/Week	:4
Exam Hrs	:3	Credit	:4

Course Objectives:

- To give the concepts of object oriented programming and to impart the programming skills in C++.
- Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
- Understand dynamic memory management techniques
- Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
- Demonstrate the use of various OOPs concepts with the help of programs

UNIT I PRINCIPLES OF OBJECT ORIENTED PROGRAMMING

Object Oriented Programming Paradigm - Basic Concepts and Benefits of OOP – Object Oriented Language - Application of OOP - Structure of C++ - Applications of C++ - Tokens, Expressions - Conditional Statements and Looping Structures - Operators on C++ - Manipulators.

(Content – 10 Hrs, Assessment-2 Hrs)

(12 Hrs)

UNIT II FUNCTIONS IN C++

Function Prototyping - Call by Reference - Return by Reference - Inline Functions – Default Arguments - Constructor Arguments - Function Overloading - Friend and Virtual Functions - Classes and Objects - Member Functions - Nesting of Member Functions – Private Member Functions - Memory Allocation of Objects - Static Data Members – Static Member Functions - Arrays of Objects – Objects as Function Arguments .

(Content – 10 Hrs, Assessment-2 Hrs)

(12 Hrs)

UNIT III CONSTRUCTORS

Parameterized Constructors – Multiple Constructors - Constructor with Default Parameters - Copy and Dynamic Constructors - Destructors - Operator Overloading - Overloading Unary and Binary Operators - Overloading Operators using Friend Function.

(Content – 10 Hrs, Assessment-2 Hrs)

(12 Hrs)

UNIT IV INHERITANCE

Defining Derived Classes - Single Inheritance - Making a Private Member Inheritable - Multiple Inheritance – Hybrid Inheritance - Virtual Base Class - Abstract classes - Constructors in Derived Class - Member Classes - Nesting of Classes.

(Content – 10 Hrs, Assessment-2 Hrs)

(12 Hrs)

UNIT V STREAMS FORMATTED AND UNFORMATTED I/O

Defined Manipulators - File I/O - Reading and Writing - Various Functions. **Exception**

Handling: try - throw - catch Statements – Re-throwing.

(Content – 10 Hrs, Assessment-2 Hrs)

(12 Hrs)

Text Book:

E. Balagurusamy, “Object Oriented Programming with C++”, TMG, 7th Ed., New Delhi, 2017.

Reference Books:

1. Robert Lafore, “Object Oriented Programming in Microsoft C++”, Galgotia Publications, New Delhi, 2000.
2. Bjarne Stroustrup, “The C++ Programming Language”, Addison- Wesley, 4th ed., 2013.

Web-Resources:

<https://www.w3schools.com/cpp/>

<http://nptelvideos.com/video.php?id=2187&c=28>

Course Outcomes:

On completion of the Course, Students should be able to

- Learn the basic concepts in Object-Oriented programming
- Develop programming skills by applying Object-Oriented programming
- Discuss the function overloading and Member Functions
- Understand the concepts of Constructors and Inheritance
- An Ability to incorporate Exception Handling in Object-Oriented programs
- Analyze File Input/Output Streams

CORE COURSE – V(CC)
PROGRAMMING IN C++ LAB

Internal Marks	: 40	Semester	:II
External Marks	:60	No. of Hours/Week	:4
Exam Hrs	:3	Credit	:4

Course Objectives:

- To understand the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
- Understand how to produce object-oriented software using C++
- To familiarize the students with language environment.
- To implement various concepts related to language.
- Be able to understand the difference between object oriented programming and procedural oriented language and data types in C++.

List of Practicals:

1. a) Program to find factorial of a given number.
b) Program to convert dollars to rupees.
2. Program to illustrate the call by value and call by reference
3. Define a class to represent a bank account. Include the following members:
Data members: Name of the depositor, Account number, Type of account Balance amount in the account
Member functions : To assign initial values, To deposit an amount, To withdraw an amount after checking the balance, To display the name and balance. Write a main program to invoke the member functions.
Consider a shopping list of items for which orders are placed with a dealer. The list should include the code number and price of each item. Operations such as adding an item to the list, deleting an item from the list and printing the total value of the order are to be provided for. Write a program to implement the above using a class with arrays as data members.
4. a) Program to find the largest of three numbers using inline function.
b) Program to find mean of 'N' numbers using friend function.
5. a) Program to find volume of cube, cylinder and rectangular box using function overloading.
b) Program to add two times in hours and minutes format using objects as function arguments.
6. Program to illustrate the use of arrays of objects.

7. Program to add two complex numbers using overloaded constructors
8. Program to illustrate unary and binary operator overloading
9. Program to check whether the given string is a palindrome or not using pointer method.
10. Program to read the derived class data members such as name, roll number, sex, height and weight from the keyboard and display the contents of a class on the screen. Write a program to demonstrate a single inheritance.

Course Outcomes:

On completion of the Course, Students should be able to

- After the completion of this course, the students will be able to develop applications.
- Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
- Understand dynamic memory management techniques using pointers, constructors, destructors, etc
- Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.
- Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
- Demonstrate the use of various OOPs concepts with the help of programs.

I ALLIED COURSE – II(AC)
ELEMENTS OF ACCOUNTING

Internal Marks	: 25	Semester	:II
External Marks	:75	No. of Hours/Week	:3
Exam Hrs	:3	Credit	:3

Course Objectives:

- To provide the basic knowledge of the financial accounting including double entry book keeping.
- Preparation of journal subsidiary book ledger trail balance and balance sheet.
- To introduce students to Accounting, stressing its importance in today's business world.
- To help students understand the main concepts and principles of Accounting.
- To provide students with a theoretical basis upon which they will develop their knowledge in other areas of accounting.

UNIT I ACCOUNTING AND BOOK KEEPING

Meaning of Accounting and Book keeping - Objectives – Accounting Concepts and Conventions – Principles of Double Entry – Kinds of Account – Journal and Ledger Accounts.

(Content – 07 Hrs, Assessment-2 Hrs)

(09 Hrs)

UNIT II SUBSIDIARY BOOKS

Purchases Book, Sales Book, Purchase Returns Book, Sales Returns, Bills Receivable Book, Bills Payable Book, Petty Cash Book and Journal Proper –Cash Book – Single Column only.

(Content – 07 Hrs, Assessment-2 Hrs)

(09 Hrs)

UNIT III TRAIL BALANCE

Trail Balance – Rectification of Errors – Suspense Account – Bank Reconciliation Statement.

(Content – 07 Hrs, Assessment-2 Hrs)

(09 Hrs)

UNIT IV FINAL ACCOUNTS

Final Accounts – Trading Account, Profit and Loss Account , Balance Sheet – Opening, Adjusting and Closing Entries.

(Content – 07 Hrs, Assessment-2 Hrs)

(09 Hrs)

UNIT V DEPRECIATION AND PROVISIONS

Depreciation and Provisions - Methods of Depreciation - Straight Line Method and Diminishing Balance Method .

(Content – 07 Hrs, Assessment-2 Hrs)

(09 Hrs)

Text Book:

T.S.Reddy & Dr.A.Murthy, Financial Accounting Marghum Publications-2015.

Reference Books:

1. Advanced Accountancy by Shukla and Grewal
2. Advanced Accountancy by R.L. Gupta and Radhaswamy

Web-Resources:

https://www.tutorialspoint.com/accounting_basics/cost_accounting_elements_of_cost.html

<http://www.ddegjust.ac.in/studymaterial/bba/bba-104.pdf>

Course Outcomes:

On completion of the Course, Students should be able to

- Preparing financial statements in accordance with appropriate standards.
- Prepare ledger accounts using double entry bookkeeping and record journal entries accordingly.
- Interpreting the business implications of financial statement information
- Communicating complex ideas in writing and through oral presentations
- Working effectively in diverse team settings
- Effectively coordinating and motivating a group to achieve its best output

CORE COURSE – VI (CC)

JAVA PROGRAMMING

Internal Marks	: 25	Semester	:III
External Marks	:75	No. of Hours/Week	:6
Exam Hrs	:3	Credit	:5

Course Objectives:

- To learn why Java is useful for the design of desktop and web applications.
- To learn how to implement object-oriented designs with Java.
- To identify Java language components and how they work together in applications.
- To design and program stand-alone Java applications.
- To learn how to use exception handling in Java applications.

UNIT I BASIC CONCEPTS OF OOPS

Benefits of OOPS- Java History-Java Features- Java Environment- Java Tokens- Constants- Variables- Data Types - Operators and Expressions- Decision Making and Branching- Decision Making and Looping.

(Content – 15 Hrs, Assessment-3 Hrs) (18 Hrs)

UNIT II CLASSES, OBJECTS AND METHODS

Classes and Objects- Constructors- Method Overloading- Static Members- Inheritance- Overriding Methods- Final Variables, Final Methods and Final Classes - Finalizer Method- Abstract Methods and Abstract Classes - Visibility Control - Arrays - Strings.

(Content – 15 Hrs, Assessment-3 Hrs) (18 Hrs)

UNIT III INTERFACES

Defining Interface- Extending Interfaces- Implementing Interfaces- Packages- Multithreaded Programming: Thread Life Cycle - Thread Exceptions – Thread Priority- Synchronization.

(Content – 15 Hrs, Assessment-3 Hrs) (18 Hrs)

UNIT IV MANAGING ERRORS AND EXCEPTIONS

Types of Errors- Exceptions- Syntax of Exception Handling Code-Multiple Catch Statements- Using Finally Statements- Managing Input / Output Files in Java: Concept of Streams- Stream Classes- Character Stream Classes- Reading / Writing Characters- Reading / Writing Bytes- Handling Primitive Data Types- Random Access files.

(Content – 15 Hrs, Assessment-3 Hrs) (18 Hrs)

UNIT V AWT

Event Handling Methods- Labels- Button Control- Check Box Control- Radio Button Control- Choice Control- List Control-Flow Layout- Border Layout- Grid Layout- Menus- Mouse Events-Applets: Life cycle of an Applet- Development and Execution of a Simple Applet.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

Text Books:

1. E.Balagurusamy, “Programming with JAVA”, Tata McGraw Hill, New Delhi, 4th edition.

(UNIT I,II,III,IV)

2.C. Muthu, “Programming with JAVA”, Vijay Nicole Imprints Private Limited, Chennai, Second Edition, 2011. (UNIT V)

Reference Book:

Herbert Schildt, Complete Reference Java 2, Tata McGraw-Hill Publishing Company Limited, Fifth Edition, 2009.

Web-Resources:

http://www.math.hcmuns.edu.vn/~hvtbao/courses/java_programming/lecture_notes/

https://mrcet.com/downloads/digital_notes/CSE/II%20Year/JAVA%20PROGRAMMING_19.11.2018.pdf

http://www.crectirupati.com/sites/default/files/lecture_notes/PRKJAVA-1.pdf

Course Outcomes:

On completion of the Course, Students should be able to

- Students will have the knowledge and skills to:
- Read and understand Java-based software code of medium-to-high complexity.
- Use standard and third party Java's API's when writing applications.
- Understand the basic principles of creating Java applications with graphical user interface (GUI).
- Create rich user-interface applications using modern API's such as JAVAFX.
- Understand the fundamental concepts of computer science: structure of the computational process, algorithms and complexity of computation.
- Understand the basic approaches to the design of software applications.
- Apply the above to design, implement, appropriately document and test a Java application of medium complexity, consisting of multiple classes.

CORE COURSE VII(CC)
JAVA PROGRAMMING LAB

Internal Marks	: 40	Semester	:III
External Marks	:60	No. of Hours/Week	:4
Exam Hrs	:3	Credit	:4

Course Objectives:

- To understand how to design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.
- To build software development skills using java programming for real world applications.
- To implement frontend and backend of an application .
- To implement classical problems using java programming.
- The use of Java in a variety of technologies and on different platforms.

List of Practicals:

1. Write simple programs to demonstrate
 - a) the various forms of inputs in Java
 - b) Operators and expressions
 - c) Control statements
2. Write a Java Program to define a class, describe its constructor, and instantiate its Object
3. Write a Java Program to demonstrate method overloading
4. Write a Java Program to demonstrate single and two Dimensional arrays.
5. Write a Java program to demonstrate various methods in the String and String Bufferclass.
6. Write a Java Program to demonstrate methods in the Vector class.
7. Write a Java Program to implement single inheritance
8. Write a Java Program to implement multiple inheritance
9. Write a Java program to implement the concept of importing classes from user defined package and creating packages.
10. Write a Java program to implement the concept of threading by using Thread class and Runnable interface.
11. Write a Java program to implement the concept of Exception Handling.
12. Write a Java program using Applet
 - a) to display a message.
 - b) for passing parameters.
13. Write a Java programs for using Graphics class to display basic shapes and fill them and set background and foreground colors.

14. Write a Java program to demonstrate use of I/O streams.

Course Outcomes:

On completion of the Course, Students should be able to

- Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
- Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.
- Demonstrate understanding and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.

NON-MAJOR ELECTIVE –LAB (NME)

MULTIMEDIA LAB

Internal Marks	: 40	Semester	: III
External Marks	: 60	No. of Hours/Week	: 2
Exam Hrs	: 3	Credit	: 2

Course Objectives:

- To offer the knowledge of creating and working with digital images and to manipulate them and to develop a presentation package using multimedia tools.
- Learn the various photo editing features and animation techniques and demonstrate proficiency in developing the multimedia presentations.
- Represent data in multimedia applications; examine image data, video data, and audio data in detail.
- Apply compression techniques to multimedia content Carry out the multimedia projects using software tools such as Macromedia flash using Object oriented design and Action script.
- Explore network technologies and protocols that make interactive multimedia applications.

Macromedia Flash

1. Create an animation to represent the growing Moon.
2. Create an animation to indicate a ball bouncing on steps.
3. To Simulate Movement Of A Cloud
4. Display the background given (filename: Tulip.jpg) through your name.
5. Create an animation with the following features.
WELCOME
 - a) Letters should appear one by one
 - b) The fill color of the text should change to a different color after the Display of the full word.
6. To simulate a ball hitting another ball.
7. To Change A Circle Into a Square Using Flash.

Course Outcomes:

On completion of the Course, Students should be able to

- To learn and understand technical aspect of Multimedia Systems.
- Develop various Multimedia Systems applicable in real time.
- To develop multimedia application and analyze the performance of the same.
- Know various multimedia software tools.
- Design multimedia software that are suitable to Internet applications

CORE COURSE - VIII

DATA STRUCTURES AND ALGORITHMS

Internal Marks	: 25	Semester	:IV
External Marks	:75	No. of Hours/Week	:5
Exam Hrs	:3	Credit	:5

Course Objectives:

- To give a fundamental knowledge on data structures and exposure to development of algorithms related to data structures.
- To access how the choices of data structure & algorithm methods impact the performance of program.
- To Solve problems based upon different data structure & also write programs.
- Choose an appropriate data structure for a particular problem.
- To use appropriate algorithmic strategy for better efficiency

UNIT I INTRODUCTION AND OVERVIEW

Introduction - Basic Terminology - Elementary Data Organization - Data Structures - Data Structure Operations. **Arrays:** Introduction - Linear Arrays - Representation – Traversing Insertion and Deletion. **Searching:** Linear Search - Binary Search.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

UNIT II LINKED LISTS

Introduction - Linked Lists - Representation of Linked List in Memory - Traversing a Linked List - Searching a Linked List – Memory Allocation, Garbage Collection - Insertion into a Linked List - Deletion from a Linked List.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

UNIT III STACKS, QUEUES AND RECURSION

Introduction - Stacks – Array Representations of Stacks - Arithmetic Expressions- Polish Notation - **Recursion:** Factorial Function and Fibonacci Sequence. **QUEUES:** Representation of Queues - Array Representation of Queues.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

UNIT IV TREES

Introduction - Binary Trees - Representing Binary Trees in Memory – Traversing Binary Trees- Binary Search Tree- Searching and Inserting in Binary Search Trees - Deleting in Binary Search Trees. **SORTING:** Introduction -Insertion Sort - Selection Sort - Merge Sort - Heap Sort – Quick Sort.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

UNIT V THE COMPLETE DEVELOPMENT OF AN ALGORITHM

Algorithms – Basic Steps. **ALGORITHM DESIGN METHODS:** Sub goals – Hill Climbing and Working Backward – Heuristics – Backtrack Programming – Branch and Bound.
(Content – 13 Hrs, Assessment-2 Hrs) (15 Hrs)

Text Book :

1. Seymour Lipschutz, “Data Structures”, Tata McGraw Hill Publishing Company Limited, New Delhi, 2014. UNITS: I, II, III & IV
2. S.E. Goodman and S.T. Hedetniemi, “Introduction to the Design and Analysis of Algorithms”, Tata McGrawHill, International Edition, 1987. UNIT: V

Reference Books:

1. Ellis Horowitz, SartajSahni and Dinesh Mehta, “Fundamentals of Data Structures in C++”, University Press (India) Pvt. Ltd., Hyderabad, 2007.
2. Yashavant P. Kanetkar, “Data Structures Through C++”, BPB Publications, 2008.

Web-Resources:

https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_DS_Lecture_NOTES_2.pdf
https://ece.uwaterloo.ca/~dwharder/aads/Lecture_materials/#lists-stacks-queues
http://www.vssut.ac.in/lecture_notes/lecture1428550942.pdf

Course Outcomes:

On completion of the Course, Students should be able to

- Learn the fundamental Concepts of Data Structures
- Understand the working principles of Linked List, Stack, Queue and Trees.
- Determine the applications of Linked List, Stack, Queue and Trees.
- Grasp various operations and searching methods applied using Binary Tree.
- Demonstrate understanding of various sorting algorithms, including insertion sort, selection sort, merge sort, heap sort and quick sort.
- Comprehend various Algorithm Design Strategies.

CORE COURSE - VIII

DATA STRUCTURES USING C++ LAB

Internal Marks : 40

Semester : IV

External Marks : 60

No. of Hours/Week : 2

Exam Hrs :3

Credit : 2

Course Objectives:

- To understand basic data structures such as arrays, linked lists, stacks and queues.
- Know about the basic concepts of Function, Array and Link-list.
- Understand how several fundamental algorithms work particularly those concerned with Stack, Queues, Trees and various Sorting algorithms.
- Understand how work the graphs, trees and heaps function
- Design new algorithms or modify existing ones for new applications and able to analyze the space & time efficiency of most algorithms

List of Practicals:

1. Merging two arrays into a single array.
2. To find the following in a matrix:
 - i. Row Sum
 - ii. Column Sum
 - iii. Sum of all the elements
3. Matrix Addition and Multiplication operations
4. To find an element using Sequential and binary search.
5. Perform the following types of Sorting: i. Bubble sort ii. Insertion sort iii. Selection sort
6. To find the Factorial of a number using Recursion
7. To PUSH and POP an element from STACK
8. To Insert and Delete an element from QUEUE.
9. To insert and delete a node in a linked list.
10. Program to traverse a binary tree

Course Outcomes:

On completion of the Course, Students should be able to

- Describe the hash function and concepts of collision and its resolution methods.
- Solve problem involving graphs, trees and heaps
- Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data.
- To design the algorithms to solve the programming problems.
- To analyze the problems to apply suitable algorithm and data structure.
- To use appropriate algorithmic strategy for better efficiency.
- To discriminate the usage of various structures in approaching the problem solution

II ALLIED COURSE – II(AC)

FINANCIAL MANAGEMENT

Internal Marks	: 25	Semester	: IV
External Marks	: 75	No. of Hours/Week	: 4
Exam Hrs	:3	Credit	: 3

Course Objectives:

- Basic knowledge of Fundamentals of Financing and Accounting such as calculation of cost, revenue and profit
- To present the whole range of book keeping & accountancy and to give comprehensive coverage to management accounts.
- Provide an in-depth view of the process in financial management of the firm
- Develop knowledge on the allocation, management and funding of financial resources.
- Improving students' understanding of the time value of money concept and the role of a financial manager in the current competitive business scenario.

UNIT I

Accounting Principles and Concepts – Double entry book keeping- Income and expenditure- Accounting record and system- assets and liabilities- Depreciation, Depletion and Amortization - Accounting for depreciation.

(Content – 10 Hrs, Assessment-2 Hrs) (12 Hrs)

UNIT II

Journal – Ledger- Trial Balance- Trading, Manufacturing and profit and Loss account – Balance sheet.

(Content – 10 Hrs, Assessment-2 Hrs) (12 Hrs)

UNIT III

Analysis and interpretation of financial statements with ratios.

(Content – 10 Hrs, Assessment-2 Hrs) (12 Hrs)

UNIT IV

Cost Accounting- Methods and Techniques of Cost Accounting- classifications of cost - Material Cost- Labour Cost – Overhead- fixed and variable cost- Cost volume – profit analysis - marginal costing and decision making.

(Content – 10 Hrs, Assessment-2 Hrs) (12 Hrs)

UNIT V

Budgeting and budgetary control – types of budgets- Preparation of various functional budgets- Preparations of cash budgets- flexible budgets- Advantages of Budgeting and Budgetary control.

(Content – 10 Hrs, Assessment-2 Hrs) (12 Hrs)

Text Books:

1. T.S. Grewal, “Double Entry Book Keeping”, All India Sultan Chand (Recent Edition)
2. S.N. Maheswari “Principles of Management Accounting “, Sultan Chand, New Delhi (Recent Edition)
3. Shukla, Grewal & Gupta, “Advanced Accounts”, Sultan Chand Publications.

Reference Books :

1. S.K. Gupta & R.K. Sharma- Practical Problems in Management Accounting (Recent edition)
2. Khan and Jain “Financial Management” Tata McGraw Hill (Recent Edition)

Web Resources:

http://www.crectirupati.com/sites/default/files/lecture_notes/finance%20notes.pdf
<http://www.csun.edu/~zz1802/Finance%20303/Web-Stuff/Lecture-Notes-Mid1.pdf>

Course Outcomes:

On completion of the Course, Students should be able to

- Preparing accounting information for planning and control and for the evaluation of finance.
- Prepare Bank reconciliation statement from incomplete statement
- Explain the purpose of double entry system to understanding the accounting system properly. Preparation of ratification errors.
- Explain the concept of fundamental financial concepts, especially time value of money.
- Apply capital budgeting projects using traditional methods.

II ALLIED COURSE – III (AC)

TALLY LAB

Internal Marks	: 40	Semester	:IV
External Marks	: 60	No. of Hours/Week	:3
Exam Hrs	:3	Credit	:3

Objective:

- This course helps students to work with well-known accounting software i.e. Tally ERP.9
- To impart knowledge regarding concepts of Financial Accounting Tally is an accounting package which is used for learning to maintain accounts.
- To acquaint students with the accounting concept, tools and techniques influencing business organization.
- Accounting with Tally is not just theoretical program, but it also includes continuous practice, to make students ready with required skill for employability in the job market.
- To get placements in different offices as well as companies in Accounts departments.

List of Practicals:

1. Architecture and customization of Tally
2. Configuration of Tally
3. Tally Screens and Menus
4. Creation of new company and groups
5. Preparation of voucher entries.
 - a. Payment voucher
 - b. Receipt voucher
 - c. Sales voucher
 - d. Purchase voucher
 - e. Contra voucher
 - f. Journal voucher
6. Ledger Creation
7. Preparation of Trail balance
8. Preparation of Profit and loss statement.
9. Preparation of Balance Sheet.
10. Preparation of Bank Reconciliation Statement

Course Outcomes:

On completion of the Course, Students should be able to

- At the end of the course student should be able to use accounting and business terminology.
- After successfully qualifying practical examination, students will be awarded certificate to work with well-known accounting software i.e. Tally ERP.9
- Student will do by their own create company, enter accounting voucher entries including advance voucher entries, do reconcile bank statement, do accrual adjustments, and also print financial statements, etc. in Tally ERP.9 software.
- Students do possess required skill and can also be employed as Tally data entry operator.
- Thorough understanding of Electronic Accounting.

NON MAJOR ELECTIVE-II (NME)

HTML LAB

Internal Marks	: 40	Semester	:IV
External Marks	: 60	No. of Hours/Week	:2
Exam Hrs	:3	Credit	:2

Objectives

- To teach the basics involved in publishing content on the World Wide Web. This includes the 'language of the Web' – HTML, the fundamentals of how the Internet and the Web function
- To create Web application using tools and techniques used in industry.
- Understand the principles of creating an effective web page, including an in-depth consideration of information architecture.
- Develop skills in analyzing the usability of a web site.
- Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice.

List of Practicals:

1. Create a web page to illustrate Html Body Tag and Pre Tags.
2. Create a web page to illustrate Text Font Tag.
3. Create a web page to illustrate Text Formatting Tag.
4. Create a web page using Marquee Tag.
5. Create a web page to illustrate the Image Tag
6. Create a web page to illustrate the Hyperlink Tag.
7. Create a web page to illustrate Order List and Unordered List Tag.
8. Create a web page to illustrate the table using Table Tag.
9. Create a web page to illustrate the Frame Tag.
10. Create a web page to illustrate the Form Tag.

Course Outcomes:

On completion of the Course, Students should be able to

- Develop skills in analyzing the usability of a web site.
- Understand how to plan and conduct user research related to web usability.
- Understand basic concepts in HTML.
- Analyze a web page and identify its elements and attributes.
- Implement a variety of hyperlinks to connect pages and communicate with users via email link.
- Structure content on web pages.

SKILL BASED COURSE II

HTML AND CSS LAB

Internal Marks : 40

External Marks : 60

Exam Hrs :3

Semester :IV

No. of Hours/Week :2

Credit :2

Objectives

- To get familiar with basics of the Internet Programming.
- To acquire knowledge and skills for creation of web site considering both client and server side programming.
- To gain ability to develop responsive web applications
- Design a basic web site using HTML5 and CSS3 to demonstrate responsive web design.
- Be able to embed social media content into web pages.

List of Practicals:

HTML5

1. Usage of New Semantic Elements
2. Create Page Structure and Navigation
3. Create Form Input and Validation.
4. Create Image onto Canvas.

CSS3

5. Selectors and Colors
6. Text and Drop Shadows
7. Transition- Rotating Box
8. Linear Gradient and Radial gradient.
9. 2D and 3D Animations
10. SVG, Drag and Drop.

Course Outcomes:

On completion of the Course, Students should be able to

- Create a web page using HTML5 semantic elements.
- Ability to link web pages using anchor tags.
- Ability to style the web pages using CSS3 style sheets.
- Integrating the concepts of HTML5 and CSS3 in creating a web page.
- Applying different types of gradient and animation effects in a web page.
- Create HTML5 forms and canvas in a web page.

CORE COURSE - VIII
MOBILE COMPUTING

Internal Marks	: 25	Semester	: V
External Marks	: 75	No. of Hours/Week:	6
Exam Hrs	:3	Credit	:5

Course Objectives:

- To understand the basic concepts and methods of mobile communication systems.
- To impart fundamental concepts in the area of mobile computing, to provide a computer systems perspective on the converging areas of wireless networking, embedded systems, and software, and to introduce selected topics of current research interest in the field.
- It will provide a complete overview of the mobile computing subject area, including the latest research
- In both broad and in-depth knowledge, and a critical understanding of mobile computing from different viewpoints: infrastructures, principles and theories, technologies, and applications in different domains.

UNIT I MOBILE COMMUNICATIONS OVERVIEW

Mobile Communication- Mobile Computing – Mobile Computing Architecture -Mobile System Networks - Data Dissemination - Mobility management -Security. **Mobile Systems:** Mobile Phones - Smart Systems - Limitations of Mobile Devices

(Content – 15 Hrs, Assessment-3 Hrs) (18 Hrs)

UNIT II GSM AND SIMILAR ARCHITECTURES

GSM - Services and System Architecture - Radio Interfaces - Protocols - Localization - Calling – Handover - Security - GPRS. 44 45 **Wireless Medium Access Control And Cdma-Based Communication:** Medium Access Control - Introduction to CDMA Based Systems

(Content – 15 Hrs, Assessment-3 Hrs) (18 Hrs)

UNIT III MOBILE IP NETWORK LAYER

IP and Mobile IP Network Layers – Packet Delivery and Handover Management - Location Management – Registration - Tunnelling and Encapsulation - Route Optimization. **Mobile Transport Layer:**Conventional TCP/IP Transport Layer Protocols - Indirect TCP - Snooping TCP - Mobile TCP.

(Content – 15 Hrs, Assessment-3 Hrs) (18 Hrs)

UNIT IV MOBILE DEVICES

Device Management - Mobile File Systems - Security. **Mobile Ad-Hoc And Sensor Networks:** Introduction to Mobile Ad-Hoc Network - MANET - Wireless Sensor Network - Applications.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT V MOBILE APPLICATION LANGUAGES

XML - JAVA -J2ME - JAVA Card. **Mobile Operating Systems:** Operating System - Windows CE - Symbian OS - Linux for Mobile Devices - Android.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

Text Book :

Raj Kamal, “Mobile Computing”, Oxford University Press, New Delhi, 2010.

Reference Books :

Jochen Schiller, “Mobile Communication”, Pearson Education, New Delhi, 2008.

Web Resources:

<https://cseexamhacks.files.wordpress.com/2017/01/mobile-computing.pdf>

<https://www.vidyarthiplus.com/vp/attachment.php?aid=43026>

Course Outcomes:

On completion of the Course, Students should be able to

- To explore Mobile security issues.
- To integrate multimedia, camera and Location based services in Android Application
- To be familiarized with Intent, Broadcast receivers and Internet services.
- To learn activity creation and Android UI designing.
- Describe the possible future of mobile computing technologies and applications.

CORE COURSE - XI
OPERATING SYSTEMS

Internal Marks	: 25	Semester	: V
External Marks	: 75	No. of Hours/Week	: 6
Exam Hrs	:3	Credit	: 5

Course Objectives:

- To gain the basic knowledge about the operating systems and its various schemes and services.
- To make students able to learn different types of operating systems along with concept of file systems and CPU scheduling algorithms used in operating system.
- To provide students knowledge of memory management and deadlock handling algorithms
- At the end of the course, students will be able to implement various algorithms required for management, scheduling, allocation and communication used in operating system.
- To study the need for special purpose operating system with the advent of new emerging technologies

UNIT I INTRODUCTION

Meaning – Early Systems - Multiprogrammed Batch Systems – Real-Time Systems.

Computer System Structures: Computer-System Operation - Storage Hierarchy - General System Architecture. **Operating System Structures:** System Components - System Calls - Virtual Machines - System Generation.

(Content – 15 Hrs, Assessment-3 Hrs) **(18 Hrs)**

UNIT II PROCESS MANAGEMENT

Processes - Process Concept - Operation on Processes - Inter-Process Communication.

CPU Scheduling: Basic Concepts - Scheduling Algorithms - Real Time Scheduling. **Process Synchronization:** Background - Critical-Selection Problem –Semaphores. **Deadlocks:** System Model - Methods for Handling Deadlocks - Deadlock Avoidance - Recovery from Deadlock.

(Content – 15 Hrs, Assessment-3 Hrs) **(18 Hrs)**

UNIT III MEMORY MANAGEMENT

Background - Swapping - Paging - Segmentation with Paging. **Virtual Memory:** Demand Paging – Page Replacement - Allocation of Frames – Thrashing.

(Content – 15 Hrs, Assessment-3 Hrs) **(18 Hrs)**

UNIT IV FILE – SYSTEM INTERFACE

File Concept - Access Methods – Directory Structures File-System Implementation: File-system Structure – Allocation Methods - Directory Implementation -

Efficiency and Performance - Recovery. **Mass Storage Structure:** Disk Structure - Disk Scheduling - Swap-Space Management - Stable-Storage Implementation.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT V PROTECTION:

Goals of Protection - Access Matrix - Capability Based Systems - Language-based Protection. **Security:** The Security Problem - Authentication - Security Systems and Facilities - Encryption. **Distributed Systems:** Distributed System Structures: Background – Distribution Coordination: Mutual Exclusion- Atomicity – Concurrency Control – Deadlock Handling- Election Algorithms.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

Text Book:

Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, 9th Ed., John Wiley & Sons Inc., New Delhi 2013.

Reference Books :

1. Harvey M. Deitel, “An Introduction to Operating System”, 3rd ed., Addison Wesley, New York, 2003.
2. Andrew S. Tanenbaum, “Modern Operating Systems”, 4th ed., Prentice Hall, New Delhi, 2014.

Web-Resources:

<http://www.svecw.edu.in/Docs%5CCSEOSLNotes2013.pdf>

http://www.crectirupati.com/sites/default/files/lecture_notes/Operating%20Systems%20Lecture%20Notes.pdf

Course Outcomes:

On completion of the Course, Students should be able to

- Understand the basic concept of Computer System and Operating System Structure
- Gain Knowledge of the fundamental aspects of process and processor managements with deadlocks and CPU scheduling
- Introduce memory and virtual memory techniques
- Understand files, directories and its accessing methods and its structures
- Ability to know mass storage devices and its scheduling
- Understand the security on the operating system and protection mechanisms.

CORE COURSE - XII
SOFTWARE ENGINEERING

Internal Marks : 25

Semester : V

External Marks : 75

No. of Hours/Week : 6

Exam Hrs :3

Credit : 5

Course Objectives:

- Knowledge of basic SW engineering methods and practices, and their appropriate application.
- Describe software engineering layered technology and Process frame work.
- A general understanding of software process models such as the waterfall and evolutionary models.
- Understanding of software requirements and the SRS documents.
- Understanding of the role of project management including planning, scheduling, risk management, etc.

UNIT I INTRODUCTION

Introduction to Software Engineering - Software Process - Software Process Models - Software Model - Requirements Engineering Principles : Requirements Engineering - Importance of Requirements - Types of Requirements - Steps involved in Requirements Engineering

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT II REQUIRMENTS ANALYSIS MODELING

Analysis Modeling Approaches - Structured Analysis - Object Oriented Analysis - Design and Architectural Engineering : Design Process and Concepts - Basic Issues in Software Design - Characteristics of Good Design - Software Design and Software Engineering - Function Oriented System vs Object Oriented System - Modularity, Cohesion, Coupling, Layering - Real Time Software Design - Design Models - Design Documentation

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT III OBJECT ORIENTED CONCEPTS

Fundamental Parts of Object Oriented Approach - Data Hiding and Class Hierarchy Creation - Relationships - Role of UML in OO Design - Design Patterns - Frameworks - Object Oriented Analysis - Object Oriented Design - User Interface Design : Concepts of User Interface - Elements of User Interface - Designing the User Interface - User Interface Evaluation - Golden Rules of User Interface Design - User Interface Models - Usability

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT IV SOFTWARE CODING

Introduction to Software Measurement and Metrics - Software Configuration - Project Management Introduction - Introduction to Software Testing - Software Maintenance

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT V WEB ENGINEERING

Introduction to Web - General Web Characteristics - Web Application Categories - Working of Web Application - Advantages and Drawbacks of Web Applications - Web Engineering - Emerging Trends in Software Engineering - Web 2.0 - Rapid Delivery - Open Source Software Development - Security Engineering - Service Oriented Software Engineering - Web Service - Software as a Service - Service Oriented Architecture - Cloud Computing - Aspect Oriented Software Development - Test Driven Development - Social Computing

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

Textbook:

Software Engineering, Chandramouli Subramanian, Saikat Dutt, Chandramouli Seetharaman, B.G. Geetha, Pearson Publications, 2015 .

Reference Book:

Software Engineering, Jibitesh Mishra, Pearson E.

Web-Resources:

http://www.vssut.ac.in/lecture_notes/lecture1428551142.pdf

<https://nptel.ac.in/downloads/106105087/>

Course Outcomes:

On completion of the Course, Students should be able to

- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to function on multi-disciplinary teams.
- An ability to identify, formulate, and solve engineering problems.
- An understanding of professional and ethical responsibility.
- Explain needs for software specifications also they can classify different types of software requirements and their gathering techniques.

MAJOR BASED ELECTIVE COURSE-I

COMPUTER GRAPHICS

Internal Marks : 25

Semester : V

External Marks : 75

No. of Hours/Week : 6

Exam Hrs : 3

Credit : 6

Course Objectives:

- To impart the basic principles of generating primitives, shapes, package development, interactive graphics, raster graphics, two and three dimensional graphics and their transformations.
- To provide comprehensive introduction about computer graphics system, design algorithms and two dimensional transformations.
- To make the students familiar with techniques of clipping, three dimensional graphics and three dimensional transformations.
- The computer graphics course prepares students for activities involving in design, development and testing of modeling, rendering, shading and animation.
- To be able to discuss the application of computer graphics concepts in the development of computer games, information visualization, and business applications.

UNIT I OVERVIEW OF COMPUTER GRAPHICS SYSTEM

Video Display Devices – Raster Scan Systems – Random – Scan Systems - Graphics Monitors and Workstations – Input Devices – Hardcopy Devices – Graphics Software.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT II OUTPUT PRIMITIVES

Line Drawing Algorithms – Loading the Frame Buffer – Line Function – Circle – Generating Algorithms. Attributes of Output Primitives: Line Attributes – Curve Attributes – Color and Grayscale levels – Area fill Attributes – Character Attributes – Bundled Attributes – Inquiry Functions.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT III 2D GEOMETRIC TRANSFORMATIONS

Basic Transformation – Matrix Representations – Composite Transformations – Window to View port Co-Ordinate Transformations. Clipping: Point Clipping – Line Clipping – Cohen-Sutherland Line Clipping – Liang Barsky Line Clipping – Polygon Clipping – Sutherland – Hodgman Polygon Clipping – Curve Clipping – Text Clipping.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT IV GRAPHICAL USER INTERFACES AND INTERACTIVE INPUT METHODS

The User Dialogue – Input of Graphical Data – Input Functions – Interactive Picture Construction Techniques.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT V THREE DIMENSIONAL CONCEPTS

3D-Display Methods – Three Dimensional Graphics Packages -3D Geometric and Modeling Transformations: Translation – Scaling – Rotation – Other Transformations.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

Text Book:

Donald Hearn M. Pauline Baker, Computer Graphics C Version, Second Edition, Pearson Education, 2014.

Reference Book:

Computer Graphics, Sunil Kumar Sharma, Manoj Singhal, Pearson Education, 2014 .

Web-Resources:

<http://www.svecw.edu.in/Docs%5CCSECGLNotes2013.pdf>

<https://drive.google.com/file/d/1st2YSA6l3KoCGiNxFmSAXHMBcDxEHN9i/view>

Course Outcomes:

On completion of the Course, Students should be able to

- Understand the basics of computer graphics, different graphics systems and applications of computer graphics.
- Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.
- Use of geometric transformations on graphics objects and their application in composite form.
- Extract scene with different clipping methods and its transformation to graphics display device.
- Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.

**MAJOR BASED ELECTIVE COURSE-I
PROGRAMMING IN PHP**

Internal Marks : 25

Semester

: V

External Marks : 75

No. of Hours/Week : 6

Exam Hrs :3

Credit : 6

Course Objectives:

- PHP and MySQL course will provide the skills and knowledge necessary
- Learn how to take a static website and turn it into a dynamic website run from a database using PHP and MySQL.
- Analyze the basic structure of a PHP web application and be able to install and maintain the web server, compile, and run a simple web application.
- Learn how databases work and how to design one, as well as how to use php MyAdmin to work with MySQL.
- Learn different ways of connecting to MySQL through PHP, and how to create tables, enter data, select data, change data, and delete data. Connect to SQL Server and other data sources.

UNIT I INTRODUCTION TO PHP

Basic Development Concepts – Creating your First PHP Script – Using Variables and Operators: Storing Data in Variables – Understanding PHP Data types – Using Constants – Manipulating Variables with Operators. Controlling Program Flow: Writing Simple Conditional Statements – Writing more complex Conditional Statements – Repeating Action with Loops Array: Sorting data in Arrays – Processing Array with Loops and Iterators – Using Array with Forms.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT II USING FUNCTION AND CLASS

Creating User – Defined Functions – Creating Class – Using Advanced OOP Concepts – Working with Files and Directories: Reading Files – Writing Files – Processing Directories – Performing other File and Director Operation.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT III WORKING WITH DATABASES AND SQL

Introducing Database and SQL –Creating and Populating a Database – Using PHP's MySQLi Extension – Adding or Modifying Data – Handling Error – Using PHP's SQLite Extension – Using PHP's PDO Extension – Building a Login Form. Working with Cookies, Session and Headers: Working with Cookies – Working with Sessions – Using HTTP Headers.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT IV WORKING WITH XML

Introducing XML – Using PHP's Simple XML Extension – Converting XML to SQL – Using PHP's DOM Extension – Handling Errors: Handling Script Errors-Using Exception-

Logging Errors– Debugging Errors – Securing PHP: Sanitizing Input and Output – Securing Data – Validating user Input.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT V TECHNOLOGIES BEHIND AJAX

Using CSS-Using DOM –Using Xml HTTP Request- Introducing order to AJAX- MVC pattern- View in AJAX- Controller in AJAX –Models in AJAX- Generating view from model.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

Text Books:

1. PHP: A Beginner's Guide, Vikram Vaswani, McGraw Hill Education, 2009
2. Dave Crane and Eric Pascarello, “Ajax in Action” 2006.

Reference Book:

The PHP Complete Reference, Steven Holzner, McGraw Hill Education, 2007.

Web-Resources:

https://www.withinweb.com/ebooks/PHP-Tutorials_sample.pdf

<https://education.fsu.edu/wp-content/uploads/2015/04/Learning-PHP-MySQL-JavaScript-and-CSS-2nd-Edition-1.pdf>

Course Outcomes:

On completion of the Course, Students should be able to

- Understand the Functionality of PHP Language
- Understand the basic Concepts of MySQL
- Develop Applications using PHP with MySQL
- Learn to Produce dynamic PHP forms
- Associate the syntax and functions available to deal with file processing for files on the server as well as processing web URLs
- Design the paradigm for dealing with AJAX FORMS using PHP

SKILL BASED COURSE II

COMPUTER GRAPHICS AND ANIMATION LAB

Internal Marks : 40

Semester

: V

External Marks : 60

Exam Hrs : 3

No. of Hours/Week : 2

Credit : 2

Course Objectives:

- To Impart Practical Training in Computer Graphics and Animation related problems.
- To implement various graphics drawing algorithms, 2D-3D transformations and clipping techniques.
- Describe and evaluate the eight major classical types of animation
- Identify modern day examples for each classical animation type.
- Emphasis on creating movement and expression utilizing traditional or electronically generated image sequences.

Photoshop:

1. (i) Handling different file formats and interchanging them, changing the resolution, color, grayscales and size of the images
(ii) Using brushes and creating multicolor real life images
2. Cropping, rotating, overlapping, superimposing, pasting photos on a page
3. Creation of a single image from selected portions of many
4. Developing a commercial brochure with background tints
5. Creating an image with multi-layers of images and texts.
6. Applying masks and filtering on images

Flash:

Develop an image(s) and do the following.

1. Basic Drawing and Painting
2. Working with Strokes and Fills
3. Creating Custom Colors, Gradients, and Line Styles Transforming and Grouping Objects
4. Creating and Managing Multiple Layers
5. Converting Text into Shapes
6. Animate using motion, shape, Tweening, and actions

Course Outcomes:

On completion of the Course, Students should be able to do

- Communicate ideas, believable action and emotion effectively by employing principles animation and performance in all aspects of drawing.
- Integrate the concepts, principles and theories involved in the physics of animation in all aspects of drawing.
- Design layouts and backgrounds that incorporate principles of composition, perspective and colour, with speed, accuracy and dexterity, using a variety of media.
- Emphasis will be on conceptualization, creativity, and visual aesthetics.
- Students can also apply skills learned in this class in other areas including motion graphics, stop motion and basic traditional animation.

SKILL BASED COURSE - III

ANDROID LAB

Internal Marks : 40

Semester : V

External Marks : 60

No. of Hours/Week : 2

Exam Hrs : 3

Credit : 2

Course Objectives:

- To describe the Android platform, Architecture and features.
- To Understand the real-time embedded and mobile systems, and the techniques essential to the design and implementation of mobile applications.
- To Understand the various parts of an Android Project.
- To Use the Android Emulator.
- Install and run the application on a physical device.
- To Create a simple User Interface.

List of Practicals:

1. Different Layout design including nested layout for a single biodata.
2. Arithmetic Operation for two numbers
3. Business Calculator
4. Animation: Bouncing of a ball
5. Intent
6. Database SQLite: Student Biodata
7. Fragments - Tablet Programming
8. Media Player

Course Outcomes:

On completion of the Course, Students should be able to

- Use Intent, Broadcast receivers and Internet services in Android App.
- Design and implement Database Application and Content providers.
- Use multimedia, camera and Location based services in Android App.
- Discuss various security issues in Android platform
- Design User Interface and develop activity for Android App.

Internal Marks : 25

Semester :V

External Marks : 75

No. of Hours/Week :2

Exam Hrs :3

Credit :2

UNIT I KNOW THYSELF/UNDERSTANDING SELF

Introduction to soft skills-Self discovery-Developing positive attitude – Improving perceptions – Forming values.

UNIT II INTERPERSONAL SKILLS / UNDERSTANDING OTHERS

Developing interpersonal relationships-Team building–Group dynamics-Networking-Improved work relationship.

UNIT III COMMUNICATION SKILLS / COMMUNICATION WITH OTHERS

Art of listening-Art of Reading- Art of Speaking-Art of Writing-Art of Writing E-Mail-E-Mail Etiquette.

UNIT IV CORPORATE SKILLS / WORKING WITH OTHERS

Developing Body Language-Practising Etiquette and Memorism –Time Management-Stress Management.

UNIT V SELLING SELF/JOB HUNTING

Writing Resume / CV-Interview Skills-Group Discussion-Mock Interview-Mock GD-Goal Setting-Career Planning.

Text Book:

A Book an Development Of Soft Skill Dr. K. Meena & Dr.V. Ayothi. Soft Skills-Dr. K. Alex & Chand Company.

Reference Books:

1. Developing the leader within you John C. Maxwell.
2. Good to Great by Jim Collins.
3. The Seven habits of highly effective people Stephen Covey.
4. Emotional Intelligence Daniel Goleman.
5. You can win Shine Khera.
6. Principle Centered Leadership Stephen Covey.

Internal Marks : 25

Semester : VI

External Marks : 75

No. of Hours/Week : 6

Exam Hrs : 3

Credit : 5

Course Objectives:

- Distinguish between data and information and Knowledge
- Distinguish between file processing system and DBMS
- Describe DBMS its advantages and disadvantages
- Describe Database users including data base administrator
- Describe data models, schemas and instances.
- Describe DBMS Architecture & Data Independence • Describe Data Language

UNIT I INTRODUCTION

Database System Applications –Database Languages – Transaction Management – Database Architecture – Database users and Administrators - **Relational Model:** Structure of Relational Databases – Database Design – ER Model – The Entity-relationship Model – Constraints – Entity Relationship Diagrams.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT II RELATIONAL ALGEBRA OPERATIONS

Relational Languages: The Tuple Relational Calculus – The Domain Relational Calculus – **SQL:** Background – Data Definition – Basic Structure of SQL Queries – Set Operations – Aggregate Functions – Null Values – Nested Sub-Queries – Views – Modification of the Database.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT III DATA NORMALIZATION

Pitfalls in Relational Database Design – Decomposition – Functional Dependencies – Normalization – First Normal Form – Second Normal Form – Third Normal Form – Boyce-Codd Normal Form – Fourth Normal Form – Fifth Normal Form – Denormalization – **Database Security:** Data Security Requirements – Protecting the Data within the Database – Granting and Revoking Privileges – Data Encryption.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT IV PL/SQL

A Programming Language: History – Fundamentals – Block Structure –Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. Control Structures and **Embedded**

SQL: Control Structures – Nested Blocks – SQ L in PL/SQL – Data Manipulation – Transaction Control statements

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT V PL/SQL CURSORS AND EXCEPTIONS

Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT...FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

Text Books:

1.“Database System Concepts”, Abraham Silberschatz, Henry F.Korth, .Sudarshan, TMH 5th Edition (Units - I, II,)

2.“Fundamentals of Database Management Systems”, Alexis Leon, Mathews Leon, Vijay Nicole Imprints Private Limited. (Unit – III)

3.“Database Systems Using Oracle” Nilesh Shah, 2nd edition, PHI.UNIT-IV: Chapters 10 & 11 UNIT-V: Chapters 12, 13 & 14)

Reference Books :

Text Book of RDBMS (Relational Database Management Systems)- By Mrs Vidya H. Bankar, Mrs DeepaShree K, Mehendale, Mrs Sujatha P. Patel

Web-Resources:

<http://www.svecw.edu.in/Docs%5CITIIBTechIISemLecDBMS.pdf>
http://www.kciti.edu/wp-content/uploads/2017/07/dbms_tutorial.pdf

Course Outcomes:

On completion of the Course, Students should be able to do

- Emphasize the need, role, importance and uses of databases in application development
- Design E-R modeling for a given situation and provide the foundation for development of relational database structure.
- Identify the advantages of the database approach over the file based data storage system.
- Distinguish between different models of file organizing, storing and using of data.
- Understand the relational model and relational algebra operations.
- Normalize the relational tables applying normalization rules.
- Apply PL/SQL procedural interfaces statement on relational tables as per requirements.

CORE COURSE – XIV

DATABASE SYSTEMS LAB

Internal Marks : 40

Semester : VI

External Marks : 60

No. of Hours/Week : 6

Course Objectives:

- To acquire knowledge on DDL,DML, and DCL commands
- To understand the usage of SQL queries
- To learn the features on PL/SQL programming and Oracle forms
- To understand and use data manipulation language to query, update, and manage a database
- To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency,
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

SQL:

1. Table Creation with various data types and constraints.
2. DLL statements (CREATE, ALTER, DROP).
3. DML statements (Retrieval, Update, Delete, Insertion).
4. Arithmetic Functions.
5. Character and String Functions.
6. Group Functions.
7. Conversation Functions.
8. Date Functions.
9. JOINS (Self, Equi and Outer).
10. Sub queries and correlated sub queries.

PL/SQL:

1. Control Structures.
2. Simple and multiple loop structures.
3. Exception Handling.
4. Explicit and Implicit Cursors.
5. Triggers

Forms/Report:

1. Employee Pay bill preparation.
2. Student mark sheet preparation.
3. Inventory Control Processing.

MY SQL

1. Design an authentication web page in PHP with MySQL to check username and password.

2. Write a program to store page views count in SESSION, to increment the count on each refresh and to show the count on web page.

Course Outcomes:

On completion of the Course, Students should be able to do

- Design and implement a database schema for a given problem-domain
- Normalize a database
- Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS
- Programming PL/SQL including stored procedures, stored functions, cursors, packages
- Analyze and design a real database application.
- Develop and evaluate a real database application using a database management system.

CORE COURSE – XV

PROJECT

Internal Marks : 40

Semester

: VI

External Marks : 60

No. of Hours/Week : 6

Exam Hrs :3

Credit : 5

Course Objectives:

- To provide basic knowledge of the real time projects of the IT industry. To develop mini real time software's using any platforms such as C, C++, Java, VB, etc.
- To Identify Project scope, Objectives and Infrastructure.
- To Develop Activity diagram and Class diagram
- To Develop Sequence diagrams and Collaboration Diagram
- To add interface to class diagram

Course Outcomes:

- Able to elicit, analyze and specify software requirements.
- Plan a software engineering process life cycle.
- Realize design practically, using an appropriate software engineering methodology
- Analyze and translate a specification into a design.
- Able to use modern engineering tools for specification, design, implementation, and testing

MAJOR BASED ELECTIVE COURSE – II
CLOUD COMPUTING

Internal Marks : 40

Semester : VI

External Marks : 60

No. of Hours/Week : 5

Exam Hrs :3

Credit : 5

Course Objectives:

- To learn how to use Cloud Services.
- To implement Virtualization and Task Scheduling algorithms.
- Apply Map-Reduce concept to applications.
- To build Private Cloud.
- Broadly educate to know the impact of engineering on legal and societal issues involved

UNIT I

Cloud Computing Foundation : Introduction to Cloud Computing – Move to Cloud Computing – Types of Cloud – Working of Cloud Computing.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

UNIT II

Cloud Computing Architecture : Cloud Computing Technology – Cloud Architecture – Cloud Modeling and Design - Virtualization : Foundation – Grid,Cloud and Virtualization – Virtualization and Cloud Computing.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

UNIT III

Data Storage and Cloud Computing : Data Storage – Cloud Storage – Cloud Storage from LANs to WANs – Cloud Computing Services : Cloud Services – Cloud Computing at Work.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

UNIT IV

Cloud Computing and Security : Risks in Cloud Computing – Data Security in Cloud – Cloud Security Services – Cloud Computing Tools : Tools and Technologies for Cloud – Cloud Mashups – Apache Hadoop – Cloud Tools.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

UNIT V

Cloud Applications – Moving Applications to the Cloud – Microsoft Cloud Services – Google Cloud Applications – Amazon Cloud Services – Cloud Applications.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

Text Book:

Cloud Computing – A Practical Approach for Learning and Implementation, A.Srinivasan and J.Suresh, Pearson India Publications, 2014

Reference Book:

Cloud Computing: Principles and Paradigms, edited by Rajkumar Buyya, James Broberg, Andrzej, Wiley India Publications, 2011

Web-Resources:

https://www.iare.ac.in/sites/default/files/lecture_notes/CC%20LECTURE%20NOTES.pdf

https://cs.uwaterloo.ca/~a78khan/courses-offered/cs446/2010_05/lecture-slides/16_CloudComputing.pdf

Course Outcomes:

- To learn how to use Cloud Services.
- To implement Virtualization
- To implement Task Scheduling algorithms.
- Apply Map-Reduce concept to applications.
- To build Private Cloud.
- Broadly educate to know the impact of engineering on legal and societal issues involved.

MAJOR BASED ELECTIVE COURSE – II
CLIENT SERVER COMPUTING

Internal Marks : 40

Semester : VI

External Marks : 60

No. of Hours/Week : 5

Exam Hrs : 3

Credit : 5

Course Objectives:

- To learn about objective evaluations and details of Client/Server development tools.
- Gain Exposure on most common used servers.
- Understand the concept of client-server development and learn problem solving skills through design scenarios for network environment.
- Analyze the contents the packet contents of different protocols.
- Develop a client –server based application

UNIT I

Introduction – defining client/server computing – Classification of client/server systems – clients/server – advantages & disadvantages –driving forces behind client/server computing.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

UNIT II

Architectures of client/server systems – introduction – components – principles behind client/server systems – client components – server components – communication middleware components – architecture for business information system – existing client/server architecture.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

UNIT III

Client/Server databases – Introduction – client/server in respect of databases – client/server database architecture – database middleware component – access to multiple databases – distributed client/server database systems – distributed DBMS – web/database system for client/server applications.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

UNIT IV

Client/Server application components – introduction – technologies for client/server application – services of a client/server application – categories of client/server applications – client services – server services – client/server application connectivity – client/server application: Layered Architecture.

(Content – 13 Hrs, Assessment-2 Hrs)

(15 Hrs)

UNIT V

System development – hardware & software requirements – communication interface technology – client/server technology & web services – what are web services – web services & client/server/browser – server technology – client/server technology & web applications.

Text Book

Subhash Chandra Yadav & Sanjay Kumar Singh, "An Introduction to Client/Server Computing", New Age International Publishers, 2009.

Web-Resources:

http://www.bcanotes.com/Download/DBMS/Rdbms/Client_Server%20Computing.pdf

<https://www.unf.edu/public/cop4610/ree/Notes/PPT/PPT8E/CH16-OS8e.pdf>

Course Outcomes

- To evaluate the operating system and database management system and its mechanism in respect to client/server computing .
- Network components used in order to build effective client/server applications.
- Define the underlying concepts in client server development using common access databases.
- Describe the concept of middleware, and communication protocols.
- Explain the different component of N Tier and Three Tier application.

**MAJOR BASED ELECTIVE COURSE – III
PYTHON PROGRAMMING**

Internal Marks : 40

Semester : VI

External Marks : 60

No. of Hours/Week : 6

Objective

- To understand the concept of Python Programming.
- Learn core Python scripting elements such as variables and flow control structures
- Write Python functions to facilitate code reuse
- Use Python to read and write files
- Work with the Python standard library
- Explore Python's object-oriented features

UNIT I

Welcome to Python - What is Python – History of Python – Features of Python – Installing Python –Running Python - Comments - Operators - Variables and Assignment – Numbers – Strings - Lists and Tuples – Dictionaries - if Statement - while Loop - for Loop and the range Built -in Function – Files and the open Built -in Function

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT II

Errors and Exceptions – Functions – Classes – Modules - Python Objects - Standard Types – Other Built-in Types - Internal Types - Standard Type Operators - Standard Type Built-in Functions -Categorizing the Standard Types - Unsupported Types - Introduction to Numbers – Integers – Floating Point Real Numbers - Complex Numbers – Operators - Built-in Functions

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT III

Sequences : Strings, Lists, and Tuples – Sequences – Strings - Strings and Operators - String-only Operators - Built-in Functions - String Built-in Methods - Special Features of Strings - Lists – Operators- Built-in Functions - List Type Built-in Methods - Special Features of Lists

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT IV

Tuples - Tuple Operators and Built-in Functions - Special Features of Tuples - Conditionals and Loops -if statement - else statement - else if statement - while statement - for statement - break statement -continue statement - pass statement - else statement

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT V

File Objects - File Built-in Function - File Built-in Methods - File Built-in Attributes - Standard Files -Command-line Arguments - File System - File Execution - Persistent Storage Modules

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

Text Book

Chun, J Wesley, CORE Python Programming, 2nd Edition, Pearson, 2007 Reprint 2010

UNIT I : Chapter 1, 2 **UNIT II :** Chapter 4, 5

UNIT III : Chapter 6 **UNIT IV :** Chapter 6, 8

UNIT V : Chapter 9

Reference Books:

Dave Kuhlman, A Python Book: Beginning Python, Advanced Python and Python exercises, 1st Edition

Web-Resources:

https://drive.google.com/file/d/1fm5ynXiDTm-iNTDJ7Py_5W8IXPJTR0hT/view

https://scipy-lectures.org/intro/language/python_language.html

Course Outcomes

After learning this course, the learner would have

- Acquired the fundamental knowledge on Python programming
- Known the usage of modules and packages in python
- Familiarity with the file concept in python
- Been skillful experimenting the concepts of oops with python language
- Become capable of solving problems using Python

SEMESTER – VI

MAJOR BASED ELECTIVE COURSE – III

DOT NET PROGRAMMING

Internal Marks : 40

Semester : VI

External Marks : 60

No. of Hours/Week : 6

Objective

- To provide the knowledge of Dot Net Frameworks along with ASP.Net and C#.
- To introduce the students to the basics of distributed application development.
- Introduce the students to Web Service development and .NET remoting.
- Technologies covered include the Common Language Runtime (CLR), .NET framework classes, C#, ASP.NET, and ADO.NET.
- To develop web applications using a combination of client-side (JavaScript, HTML, XML, WML) and server-side technologies (ASP.NET, ADO.NET).

UNIT I

Introduction: Integrated Development Environment - IDE Components -Setting Environment Options - Building a Console application -Variable-Variable as Objects - Constants-Arrays.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT II

Programming Fundamentals: Flow Control Statement-Writing & using procedures - Argument-Built-in Functions -The Textbox control -The List box, Checked List Box and Combo Box Controls-The Scrollbar or Track bar controls.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT III

Working with Forms: Appearance of Forms - Loading or showing Forms - Dynamic Forms -Designing Menus - Common Dialog controls - Rich Text box Control –List view, Tree view, or Image List Controls - Handling Strings or Characters - Handling Dates or Times - Manipulating Folders or Files -Accessing Files.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT IV

ADO .Net: The Basic Data - Access Classes-storing Data in datasets - Update Operations -Working with Typed Datasets - Data Binding - Designing Data Driven Interfaces.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

UNIT V

Building Web Applications: Understanding HTML or DHTML- working with HTML - Cascading Style Sheets - Server Side Technologies – Controls - ASP.Net Objects - Understanding Web Services.

Text Book

Evangelos Petroustos, Mastering Microsoft Visual Basic 2008, Wiley India Edition, Wiley Reprint, 2009.

Web-Resources:

<https://ecomputernotes.com/csharp/dotnet>

https://www.tutorialspoint.com/asp.net/asp.net_tutorial.pdf

<https://www.javatpoint.com/net-framework>

<http://www.chetanahegde.in/wp-content/uploads/2015/10/DotNetNotes.pdf>

Course Outcomes

- Understand the fundamental concepts of .NET frame work
- Discuss the use of various web controls and rich controls
- Infer State Management techniques in asp.net webpages
- Discuss and extend data list and data grid controls
- Demonstrate the database connectivity in ASP.NET
- Comprehend the need for XML in performance tuning