

(2019 - 20 onwards)

BACHELOR OF COMPUTER APPLICATIONS (BCA)

COURSE STRUCTURE AND SYLLABUS

(For the candidates admitted from the academic year 2019-2020 onwards)

CHOICE BASED CREDIT SYSTEM (CBCS)



**DEPARTMENT OF COMPUTER APPLICATIONS
THANTHAI HANS ROEVER COLLEGE
(AUTONOMOUS)**

**(Nationally Re-Accredited by NAAC)
(Affiliated to Bharathidasan University)**

ELAMBALUR, PERAMBALUR – 621 220



VISION

To blossom as an institution of excellence, enabling, empowering and enlightening the youth and shaping them as fully developed human beings with the capacity to unfold their full mental potentiality resulting in the attainment of the wisdom to live constructively and meaningfully.

MISSION

- To provide congenial and stress- free environment and opportunities for the enhancement of knowledge and acquisition skills through the best exposure and training possible.
- To offer multifaceted and need-based academic programmes and to promote extension activities.
- To adopt technology-enabled new methods, approaches and techniques so that the teaching-learning process becomes learner-centered and learner-friendly.
- To maximize the participation of all the stakeholders in the development of the institution and the region.
- To sensitize the youth towards inclusive growth for socio-economic change, sustainable development, gender equality, eco-friendliness, etc.
- To enable the youth to experience the effects of globalization and facilitate them to grow as responsible citizens and leaders.
- To inspire them, through value-based education, to embrace the entire humanity while firmly rooted in the Indian ethos.
- To provide regular placement training and placement opportunities.
- To kindle the spirit of creativity and enhance research activities and enable them to attain international standards.

PROGRAMME OUTCOMES (PO's)

UNDERGRADUATE PROGRAMMES

Upon completion of the programme, the undergraduate will be able to

1. Acquire knowledge, understand concepts and apply new ideas which enable them to be employable or self employed
2. Demonstrate motivation in advancing to higher learning programmes
3. Engage in socially responsible behaviour and have value added education
4. Have exposure to technical proficiency, analytical capability, soft skills and life skills development
5. Develop broad understanding in the basic concepts of Languages/ Commerce/Management Studies/Physical Sciences/Computing Sciences/Biological Sciences/Life Sciences

PROGRAMME SPECIFIC OUTCOMES (PSO's)

1. Possess the fundamental knowledge of programming languages and other core computing concepts.
2. Ability to analyze problems and choose right software tools to solve it.
3. To design, develop, test and implement software systems.
4. To apply mathematical and accounting methods in software solutions.
5. Possess employability and entrepreneurship skills.



THANTHAI HANS ROEVER COLLEGE
(AUTONOMOUS)
PERAMBALUR - 621220



BACHELOR OF COMPUTER APPLICATIONS (BCA)

COURSE STRUCTURE UNDER - CBCS

(For the candidates admitted from the academic year 2019-20 onwards)

SEM	CODE	PART	COURSE	COURSE TITLE	Instru ct.Hrs/ week	CRED ITS	Exam Intern al	Extern al	TOTA L	
I	18UT1	I	Language Course – I (LC) – Tamil*/Other Languages ** #		6	3	3	25	75	100
	18UE1	II	English Language Course – I (ELC)		6	3	3	25	75	100
	18UCA1CC1	III	Core Course – I (CC)	Programming in C	6	6	3	25	75	100
	18UCA1CP1		Core Practical– I (CP)	Programming in C Lab	4	2	3	40	60	100
	18UMA1AC1		Allied Course –I (AC)	Numerical Methods and Statistics	6	4	3	25	75	100
	18UVE	IV	Value Education	Value Education	2	2	3	25	75	100
				TOTAL		30	20	-	-	-
II	18UT2	I	Language Course – II (LC) – Tamil*/Other Languages ** #		6	3	3	25	75	100
	18UE2	II	English Language Course – II (ELC)		6	3	3	25	75	100
	18UCA2CC2	III	Core Course – II (CC)	Programming in C++	6	6	3	25	75	100
	18UCA2CP2		Core Practical – II (CP)	Programming in C++ Lab	4	2	3	40	60	100
	18UMA2AC2		Allied Course – II(AC)	Operations Research	6	4	3	25	75	100
	18UES	IV	Environmental Studies	Environmental Studies	2	2	3	25	75	100
				TOTAL		30	20	-	-	-
III	18UT3	I	Language Course – III (LC) – Tamil*/Other Languages ** #		6	3	3	25	75	100
	18UE3	II	English Language Course – III(ELC)		6	3	3	25	75	100
	18UCA3CC3	III	Core Course – III (CC)	Object Oriented Programming using Java	6	5	3	25	75	100
	18UCA3CP3		Core Practical –III (CP)	Object Oriented Programming using Java Lab	3	2	3	40	60	100
	18UMS3AC3:1		Allied Course –III (AC)	Financial Accounting	4	4	3	25	75	100
	18UMS3AP1		Allied Practical– I (AP)	Accounting Package Lab	3	2	3	40	60	100
	18UCA3NME1	IV	Non Major Elective I	Fundamentals of Computers	2	2	3	25	75	100
			TOTAL		30	21	-	-	-	700
IV	18UT4	I	Language Course – IV (LC) – Tamil*/Other Languages ** #		6	3	3	25	75	100
	18UE4	II	English Language Course – IV(ELC)		6	3	3	25	75	100
	18UCA4CC4	III	Core Course –IV (CC)	Software Engineering	5	4	3	25	75	100

	18UCA4CP4	IV	Core Practical– IV(CP)	Web Technology Lab	3	2	3	40	60	100	
	18UMS4AC4:1		Allied Course – IV (AC)	Principles of Management	4	4	3	25	75	100	
	18UMS4AP2		Allied Practical – II (AP)	Inventory Management Lab	2	2	3	40	60	100	
	18UCA4NME2		Non Major Elective II	Internet and its Applications	2	2	3	25	75	100	
	18UCA4SBE1		Skill Based Elective – I	Hardware Trouble shooting	2	2	3	40	60	100	
					TOTAL	30	22	-	-	-	800
V	18UCA5CC5	III	Core Course –V (CC)	Computer Networks	5	5	3	25	75	100	
	18UCA5CC6		Core Course – VI(CC)	Data Structures and Algorithms	5	5	3	25	75	100	
	18UCA5CC7		Core Course –VII (CC)	Relational Data Base Management Systems	5	5	3	25	75	100	
	18UCA5CP5		Core Practical –V (CP)	PHP and MYSQL Lab	4	3	3	40	60	100	
	18UCA5MBE1 :1/ 18UCA5MBE1 :2/ 18UCA5MBE1 :3		Major Based Elective – I	PHP Scripting Languages / Computer Graphics / Dot Net	5	5	3	25	75	100	
	18UCA5SBE2		IV	Skill based Elective –II	Ruby on Rails	2	2	3	25	75	100
	18UCA5SBE3			Skill based Elective –III	Web Services	2	2	3	25	75	100
	18USSD			Soft Skills Development	2	2	3	25	75	100	
					TOTAL	30	29	-	-	-	800
VI	18UCA6CC8	III	Core Course –VIII (CC)	Operating Systems	6	5	3	25	75	100	
	18UCA6CC9		Core Course – IX(CC)	Smart Device Programming	6	5	3	25	75	100	
	18UCA6CP6		Core Practical –VI(CP)	Smart Device Programming Lab	5	4	3	40	60	100	
	18UCA6MBE2 :1/ 18UCA6MBE2 :2/ 18UCA6MBE2 :3		Major Based Elective – II	Cloud Computing / Mobile Communication / XML Programming	6	6	3	25	75	100	
	18UCA6MBE3 :1/ 18UCA6MBE3 :2/ 18UCA6MBE3 :3		Major Based Elective – III	Mini Project (Students do it in our College) / Linux Lab/ Dot Net Lab	6	6	3	40	60	100	
			V	Extension Activities		-	1	-	-	-	-
	18UGS			Gender Studies		1	1	3	25	75	100
			TOTAL	30	28	-	-	-	600		
			GRAND TOTAL	180	140	-	-	-	4100		

List of Allied Courses

Allied Course I

Mathematics

Language Part – I	-	4
English Part –II	-	4
Core Paper	-	9
Core Practical	-	6
Allied Paper	-	4
Allied Practical	-	2
Non-Major Elective	-	2
Skill Based Elective	-	3
Major Based Elective	-	3
Environmental Studies	-	1
Value Education	-	1
Soft Skill Development	-	1
Gender Studies	-	1
Extension Activities -	-	1 (Credit only)

* For those who studied Tamil up to +2 (Regular Stream)

** Syllabus for Language Courses should be on par with Tamil

those who studied Tamil up to +2, but opt for other languages in degree level should studied special Tamil

Note: FOR THEORY

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]

The passing minimum for Examinations shall be 40% out of 75 marks [i.e. 30 marks]

FOR PRACTICAL

The passing minimum for CIA shall be 40% out of 40 marks [i.e. 18 marks]

The passing minimum for Examinations shall be 40% out of 60 marks [i.e. 24 marks]

Separate passing minimum is prescribed for Internal and External marks

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]

The passing minimum for Theory Examinations shall be 40% out of 75 marks [i.e., 30 marks]

SEMESTER - I

(For the candidates admitted from the academic year 2019-2020 onwards)

SEMESTER-I

Course Code: 18UCA1CC1
Instruction Hours: 5
Credits: 5

Exam Hours: 03
Internal Marks: 25
External Marks: 75

CORE COURSE - I PROGRAMMING IN C

Objectives:

- To understand Program in C Language.
- To state the basic elements required to develop programs.
- To differentiate iterative and conditional control structures and functions.
- To define the concepts of Arrays, Pointers, Structures and Union.
- To transform problem logic into programs involving programming constructs.

UNIT I

Evolution and Basic Structure of C Programs - Constants - Variables - Data Types - Operators and Expressions - Type Conversions - Built in Functions - Program for investment problem.

UNIT II

Data Input and Output - Decision Making and Branching Statements - Decision Making Different form of if statements and Looping Statements- Programming using Switch case for pay bill calculation.

UNIT III

Functions: Defining and Accessing Arguments -recursive functions -storage classes- Arrays: Defining and processing Arrays - Multidimensional arrays -passing arrays to functions -Arrays and Strings -String Functions - String Manipulations - Program for counting character, words and lines in a text using Array.

UNIT IV

Structures: Defining Structure - Declaring Structure Variable - Accessing Structure Members - Structure Initialization - Arrays of Structure - Arrays within Structures - Structures within Structures- Union - Pointers - Pointer Declarations - Operations on Pointers - Pointers with Functions - Pointers with Array, Strings - Array of Pointers - Pointers with structures - Implementation of book shop inventory using structure.

UNIT V

Files - Defining, Opening and Closing a file -I/O Operations on Files - Files with Structures and Union - Dynamic memory allocation - Linked lists - Preprocessor- Macro Substitution - Program to add items in an existing file.

Text Book

E. Balagurusamy, Programming in ANSI C, Tata McGraw Hill Publishing Company, 6thEdition, 2012

Reference Books

1. Yeshavanth P. Kanetkar, Let us C, BPB Publications, 13th Edition, 2013.
2. The Complete Reference C Herbert Schildt, 4th Edition, 2017
3. Practical C Programming, 3rd Edition, Steve Qualline O'Reilly Media, 2011.

Total Number of Topics Present in the course: 47

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	3	6.38
2	Regional	2	4.26
3	National	14	29.79
4	Global	28	59.57

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER-I

Course Code: 18UCA1CP1
Instruction Hours: 4
Credits: 2

Exam Hours: 03
Internal Marks: 40
External Marks: 60

CORE PRACTICAL - I PROGRAMMING IN C LAB

Objectives:

- To impart practical training in C Programming Language.
- To teach the student to write programs in C to solve the problems.
- To make the student learn the concepts like looping, functions, pointers, file concepts.

List of Experiments

1. Write a C program
 - a. To find the Area of Rectangle, Square and Triangle.
 - b. To swap the values of two numbers without using third variable
2. Write a C program
 - a. To Find the Biggest of Three Numbers using a Ternary Operator.
 - b. To Find the Biggest of Three Numbers using if-else statements
3. Write a C program
 - a. To find the Factorial of a Given Number using for loop.
 - b. To find the Fibonacci series using recursive functions
4. Write a C program
 - a. To sort and display all the roll numbers of your class using Arrays.
 - b. To display the following patterns using Array
A
A B
A B C
.....
5. Write a C Program to manipulate the matrix addition, subtraction, multiplication using Switch case.
6. Write a C program to calculate simple interest using functions
7. Write a C program using pointers to compute the sum of all elements stored in the array.
8. Write a C program to prepare a student mark list using the file.
9. Write a C Program to check the given number is Armstrong number.
10. Write a C Program to check the given number is Prime number

Total Number of Topics Present in the course: 10

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	3	30.00
2	Regional	0	0.00
3	National	0	0.00
4	Global	7	70.00

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER-II

Course Code: 18UCA2CC2
Instruction Hours: 5
Credits: 5

Exam Hours: 03
Internal Marks: 25
External Marks: 75

CORE COURSE - II
PROGRAMMING IN C++

Objectives:

- To understand the concepts of Object Oriented Programming Language.
- To distinguish between procedural programming and object oriented programming.
- To define the concept of data hiding, localization and modularity using classes.
- To demonstrate the use of virtual functions to implement polymorphism.

UNIT I

Object Oriented Programming: Principles - Benefits of OOP - Application of OOP - Tokens, Expression and Control Structures. Tokens - Keywords - Identifiers and Constants - Data types - Constants - Type compatibility - Variables - Reference Variables - Operators - Manipulators - Expressions - Control Structure- Debugging exercise for using if and switch statement

UNIT II

Functions - Prototyping - Call by Reference - Return by Reference - Inline Functions - Default Arguments - const Arguments - Function Overloading - Friend and Virtual Functions, Classes and Objects - Class - Member Functions-Making outside function inline - Arrays with in a Class - Memory Allocation for Objects - Static data members - Static member functions - Arrays of Objects - Objects as Function Arguments - Friendly Functions - Returning Objects - const Member Functions - Pointers to Members, Constructors and Destructors- Program for using inline function and class.

UNIT III

Operator Overloading and Type Conversions, Inheritance: Extending Classes - Derived Classes - Single Inheritance - Making private member inheritance- Multilevel Inheritance - Multiple Inheritance - Hierarchical Inheritance - Hybrid Inheritance - Virtual Base Classes - Abstract Classes, Pointers, Virtual Functions and Polymorphism: Pointers - Pointers to Objects -this Pointer - Pointers to Derived Classes - Virtual Functions - Pure Virtual Functions.

UNIT IV

Managing I/O Operations: C++ Streams - C++ Stream Classes - Unformatted I/O and Formatted I/O Operations - Managing Output with Manipulators, Working with Files: Classes for File Stream Operations - Opening and Closing a File - Detecting end of file more about open():file mode - File Pointers and Their Manipulators - Sequential I/O Operations - Updating a File - Error Handling during File Operations - Command Line Arguments- Program for ATM using files

UNIT V

Templates: Class Templates - Class Templates with Multiple Parameters - Function Templates - Function Templates with Multiple Parameters - Overloading of Template Functions - Member Function Templates – Non Type Template Arguments, Exception Handling: Basics - Exception Handling Mechanism - Throwing Mechanism - Catching Mechanism - Rethrowing an Exception - Specifying Exceptions - Debugging exercise for exceptions- Specifying Exceptions- Debugging exercise using exception handling concept

Text Book

Object Oriented Programming With C++, E. Balagurusamy, McGraw Hill Education Private Limited, 4th Edition, 2011.

Reference Books

1. C++ The Complete Reference, Herbert Schildt, 5th Edition , 2012.
2. Mastering in C++, K. R. Venugopal et al, TMH, 2nd Edition, 2010.
3. Bjarne Stroustrup, “The C++ programming language”, Addison Wesley, fourth edition, 2013.

Total Number of Topics Present in the course: 80

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	6	7.50
2	Regional	0	0.00
3	National	0	0.00
4	Global	74	92.50

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER-II

Course Code: 18UCA2CP2
Instruction Hours: 4
Credits: 2

Exam Hours: 03
Internal Marks: 40
External Marks: 60

CORE PRACTICAL -II PROGRAMMING IN C++ LAB

Objectives:

- To impart practical training in complex C++ programs.
- To enable the students to understand the concept of functions, operator overloading
- To understand the concepts of file handling.

List of Programs

1. 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.
2. Write a C++ program to invoke the member functions.
3. Write a C++ program to display the bio-data of the student using inline functions.
4. Write a C++ program To create a class “student”, to create different objects and to test the functioning using Constructors and Destructors
5. Write a C++ program to find means of giving numbers using friend function.
6. Write a C++ program to find volume of cube, cylinder and rectangle using function overloading.
7. Write a C++ program using arrays of objects.
8. Write a C++ Program to add two complex numbers using operator overloading
9. Write a C++ program using virtual functions.
10. Write a C++ program using String handling functions.
11. Write a C++ program using single inheritance for the data members such as name, roll number, sex, height and weight and display the contents.
12. Write a C++ program using file concept.
13. Write a C++ Program to calculate power of a number.
14. Write a C++ Program to find the Prime numbers between two intervals.

Total Number of Topics Present in the course: 14

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	6	42.86
2	Regional	1	7.14
3	National	0	0.00
4	Global	7	50.00

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER - III

(For the candidates admitted from the academic year 2019-2020 onwards)

SEMESTER – III

Course Code: 18UCA3CC3
Instruction Hours: 6
Credit: 4

Exam Hours: 03
External Marks: 75
Internal Marks: 25

CORE COURSE III OBJECT ORIENTED PROGRAMMING USING JAVA

Objectives:

- To understand basic concepts of java programming.
- To describe the components such as Polymorphism, Inheritance and Threads.
- To illustrate how to handle exceptions in programming.
- To categorize the stream classes.
- To explain how to write program using java applets.

UNIT I

Java Evolution: Java History-Features- How Java Differs From C&C++ -Java And Internet - Web Browsers - Hardware And S/W Requirement - Java Environment - **Overview Of Java Language:** Introduction - **Simple Java Program** - Java Tokens - Java Statement - Implementing A Java Program - JVM - Command Line Argument - Programming Style - **Constants Variables And Data Types:** Constants - Variables - Declaration Of Variable - Giving Values To Variables - Scope Of Variables - Symbolic Constants - Type Casting- **Debugging exercise using Unary operator ++, --**

UNIT II

Operators And Expressions: Arithmetic Operators - Relational Operators - Logical Operators - Assignment Operators - Increment and Decrement Operators - Conditional Operator - Bitwise Operators - Special Operators - Precedence Of Arithmetic Operators -Type Conversions In Expressions - Operator Precedence And Associability - Mathematical Functions - **Decision Making And Branching:** Introduction - Decision Making With If Statement - Simple If Statement - The If... Else Statement - Nesting Of If...Else Statement - The Else If Ladder - The Switch Statement - The ?:Operator - **Decision Making And Looping:** Introduction - The While Statement - The Do Statement - Difference between while and do while-The For Statement - Jumps in Loops - Labeled Loops.

UNIT III

Classes and Methods: Defining a Class - Method Declaration - Creating Objects - Constructors - Method Overloading - static members - Inheritance - Method Overriding - Final variable and classes - **Arrays, Strings and Vectors:** Arrays - one dimensional arrays - creating an array - two dimensional array - strings - vectors - wrapper classes - **Interfaces:** multiple inheritance Introduction - defining interfaces - extending interfaces - implementing interfaces - accessing interface variables.- Characteristics of object

UNIT IV

Packages: Putting Classes Together: Introduction - System Packages - Using System Packages - Naming Conventions - Creating Packages - Accessing a Package - Using a Package - Adding a Class to a Package - Hiding Classes - **Multithreading Programming:** Introduction - Creating Threads - Extending The Threads - Stopping And Blocking A Thread - Life Cycle of a Thread - Using Thread Methods - **Managing Errors And Exceptions:** Introduction - Types of Errors - Exception - Syntax of Exception Handling Code - Multiple Catch Statements - Using Finally Statement - Throwing Our Own Exception - **Using Exceptions For Debugging-** Advantages of Java packages

UNIT V

Applet Programming: Introduction - How Applet Differ From Applications - Preparing to Write Applets - Building Applet Code - Applet Life Cycle - Creating an Executable Applet - Designing a Web Page - Applet Tag - Adding Applet to HTML File - Running The Applet - More About Applet Tag - Passing Parameters To Applets - Aligning the Display - More About HTML Tags - Displaying Numerical Values - Getting Input From the User **Graphics Programming:** Introduction - The Graphics Class - Lines And Rectangles - Circles And Ellipses - Drawing Arcs - Drawing Polygons - Line Graphs - Using Control Loops in Applets - Drawing Bar Charts- Hierarchy of applet.

Text Book : Programming with Java- E. Balagurusamy 5th Edition(2016), McGraw Hill Education(India) Pvt Ltd. Chennai

References Books:

1. Java: The Complete Reference, Herbert Schildt,Tenth Edition(2018),McGraw-Hill Education(Publisher).
2. Let us Java - Yashavant Kanetkar - BPB Publications, New Delhi - First Edition 2012.
3. Object oriented Programming through Java - ISRD Group - TataMc-Graw Hill, New Delhi - Eight Reprint 2011.

Total Number of Topics Present in the course: 122

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	5	4.07
2	Regional	3	2.44
3	National	3	2.44
4	Global	112	91.06

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – III

Course Code: 18UCA3CP3
Instruction Hours: 3
Credit: 2

Exam Hours: 03
Internal Marks: 40
External Marks: 60

CORE PRACTICAL III OBJECT ORIENTED PROGRAMMING USING JAVA LAB

Objectives:

- To know practical training in Java Programming Language.
- To understand the use of Applets.
- To enhance the student to write programs in Java.

List of Programs:

1. Write Java Program using Control Statements to perform all the arithmetic operations using switch statement.
2. Write Java Program using String Handling functions for Count the number of vowels, consonants and words in a given sentence.
3. Write Java program to Arrange the set of names in Alphabetical order.
4. Write Java program using Classes and Objects to prepare student mark list.
5. Write Java program using Inheritance prepare EB Bill.
6. Write Java program using Interfaces and package to display employee payroll.
7. Write Java program using Multithreading.
8. Write Java program using Exception Handling to display 5 exceptions.
9. Write an Applet program to prepare a BIO-DATA.
10. Write an Applet program to create different shapes.
11. Write Java Program to compute Quotient and remainder
12. Write a Java Program to Find all Roots of a Quadratic Equation

Total Number of Topics Present in the course: 12

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	6	50.00
2	Regional	3	25.00
3	National	0	0.00
4	Global	3	25.00

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – III

Course Code: 18UCA3NME1
Instruction Hours: 2
Credit: 2

Exam Hours: 03
External Marks: 75
Internal Marks: 25

NON MAJOR ELECTIVE - I FUNDAMENTALS OF COMPUTERS

Objectives:

- To understand the basics of computer
- To differentiate different types of memory
- To define the need for computer languages
- To elaborate various types of communication with and among computers

UNIT I

Computer basics: Algorithms- A simple model Of a computer- characteristic of computers- **problem solving using computers-** **Data Representation:** Representation of Characters in computers- Representation of Integers- Hexadecimal representation of Numbers- Decimal to binary conversion- Error detecting codes- Input/output Lines: Description of computer input units- Other input methods- Computer output units - Description of computer Input units - Other input methods.

UNIT II

Computer Memory: Memory Cell- Memory Organization- Read Only Memory- Serial Access Memory- Physical device to construct memories- **Magnetic Hard disk- Floppy disk drives- Compact Disk ROM- Magnetic tape drives-** **Processors:** Structure of Instructions- Description of a Processor- A machine language program - An algorithm simulate the hypothetical computers.

UNIT III

Binary addition- Binary Subtraction- Signed Numbers- Two's complement representation of numbers- Addition/Subtraction of Numbers in 2's complement notation- Binary multiplication- Binary division- Floating point representation of numbers- Arithmetic operations with normalized floating point numbers- **Logic circuits:** Introduction- Switching circuits- AND/ OR Operations- NOT operation- Boolean function- Postulates- Duality Principle- Theorems- Precedence of operators- Venn Diagrams- Truth table- Canonical forms for Boolean function- Logic circuits- Parallel and serial adders- Physical and serial adders- Transistors- Integrated circuits - Moore's law.

UNIT IV

Computer Languages: **Need for** programming language- Assembly language- Higher level programming language- Compiling high level language program- some high level languages- Operating Systems: Need for OS- Batch Operating system- Multiprogramming Operating system- Time sharing Operating system- Personal computer operating system- The UNIX Operating system- Microkernel based Operating system- Online and Real time systems- **Computer Generation and Classification:** First generation of computers- Second generation computer- Third generation computer- fourth generation- fifth generation- Classification of Computers- Distributed Computer system- Parallel Computers

UNIT V

Computer And Communication: Types of Communication with and among computers- **Need for computer communication** networks- Internet and WWW- Characteristics of communication channel- Allocation of channel- Physical communication media- Establishing channels for communication- Computer network topologies- Communication Protocols- LAN- ATM networks- Interconnecting Networks- Computer Networks: **Computer graphics applications-** Display devices - Colour display tubes - Overview of Display method- Raster Scan Display processing unit- Input devices for interactive graphics

Text Book:

V. Rajaraman, Fundamentals of Computers, 6th Edition, Prentice Hall India Pvt., Limited, 2009.

Reference Book:

Pradeep K. Sinha and Priti Sinha, Computer Fundamentals, 6th Edition, BPB Publications, 2007.

Total Number of Topics Present in the course: 93

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	4	4.30
2	Regional	4	4.30
3	National	9	9.68
4	Global	87	93.55

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER - IV

(For the candidates admitted from the academic year 2019-2020 onwards)

SEMESTER – IV

Course Code:18UCA4CC4
Instruction Hours:5
Credit:4

Exam Hours:03
External Marks:75
Internal Marks: 25

CORE COURSE IV SOFTWARE ENGINEERING

Objectives:

- To understand various phases of Software Engineering Process
- To state fundamental of Software Process
- To describe software testing techniques.

UNIT I:

Introduction to Software Engineering: The Evolving Role of Software- Software **The Changing Nature of Software- Legacy Software-** The Quality of Legacy software - **Process Model:** Prescriptive Models- The Waterfall Model- Incremental Process Models- Evolutionary Process Models- The Concurrent Development Model- Specialized Process Models- The Unified Process.

UNIT II:

System Engineering: Computer Based System - The System Engineering Hierarchy-System modeling - **Business Process Engineering:** An Overview- **Product Engineering:** An Overview- System Modeling - **Requirements Engineering:** Requirements Engineering Tasks- Initiating the Requirements Engineering Process- Eliciting Requirements- Developing Use Cases- Building the Analysis Model- Negotiating Requirements- Validating Requirements.

UNIT III:

Building the Analysis Model: Requirements Analysis- Analysis Modeling Approaches- Data Modeling Concepts- Data Objects - Object Oriented Analysis- Scenario Based Modeling- Flow Oriented Modeling- Class Based Modeling- Creating a Behavioral Model - **Design Engineering:** Design Concepts- the Design Model- Pattern Based Software Design.

UNIT IV:

Creating an Architectural Design: Software Architecture - What is Architecture? - **Data Design** - Architectural Styles and Patterns- Architectural Design - **Modeling Component level Design:** What is a Component- Designing Class Based Components- Conducting Component level Design- Object Constraint Languages- Designing Conventional Components.

UNIT V:

Testing Strategies: A Strategic Approach to Software Testing- Strategic Issues- Test Strategies for Conventional Software- Unit Testing - Validation Testing- System Testing- The Art of Debugging - **Testing Tactics:** Software Testing Fundamentals- White Box Testing- Basis Path Testing- Control Structure Testing- Black Box Testing.

Text Book “Software Engineering - A Practitioner’s Approach” – Roger S Pressman, Tata McGraw-Hill Edition, Sixth Edition, 2010.

Reference Book “Software Engineering” – Jibithesh Mishra, Ashok Mohanty, Pearson Education, 2011.

Total Number of Topics Present in the course: 59

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	3	5.08
2	Regional	3	5.08
3	National	3	5.08

4	Global	58	98.31
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Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – IV

Course Code: 18UCA4CP4

Instruction Hours: 3

Credit: 2

Exam Hours: 03

External Marks: 60

Internal Marks: 40

CORE PRACTICAL IV

WEB TECHNOLOGY LAB

Objectives:

- To impart practical training in HTML.
- To enable the students to understand problem solving in Java script.
- To understand the concepts in Dynamic web page.

1. Creation of HTML pages with images and tables.
2. Create a simple web page using frames, links and other tags.
3. Create a web page with the following using HTML
 - i) To embed an image map in a web page
 - ii) To fix the hot spots
 - iii) Show all the related information when the hot spots are clicked.
4. Client Side Scripts for Validating Web Form Controls using DHTML.
5. Write a java script to perform all arithmetic operations.
6. Write a java script to find the second largest in a given array.
7. Write a java script to illustrate different in-built string functions.
8. Write a java script to check whether the given integer is palindrome or not
9. To implement the web application with database using JSP
10. Create a table to show your class time-table.

Total Number of Topics Present in the course: 10

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	5	50.00
2	Regional	1	10.00
3	National	2	20.00
4	Global	2	20.00

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – IV

Course Code: 18UCA4NME2
Instruction Hours: 02
Credit: 02

Exam Hours: 03
External Marks: 75
Internal Marks: 25

NON MAJOR ELECTIVE 2 INTERNET AND ITS APPLICATIONS

Objectives:

- To understand the fundamental concepts of Internet and its Applications.
- To design a web pages using HTML.
- To draw a table using various tag in HTML.
- To list out the type of Browsers.
- To illustrate HTML Table.

UNIT I:

Introduction to the Internet: Computers in Business - Networking - Unique Identifiers of Network - Internet - Electronic Mail - Resource Sharing - Gopher - World Wide Web - Usenet - #Telnet# - Bulletin Board Service - Wide Area Information Service .

UNIT II:

Internet Technologies: Modem - Half duplex and full duplex Modems - Asynchronous and Synchronous Modems - Internet Addressing - Physical Connections - Telephone Lines- Internet Browsers: Internet Explorer - Netscape Navigator

UNIT III:

Introduction to HTML: Designing a Home Page - History of HTML - HTML Generations - HTML Documents - HTML Basic Tags-Attributes -Anchor Tag - Hyper Links.

UNIT IV:

Head and Body Sections: Header Section - Title - Prologue - Links - Colorful Webpage- **Designing the Body Section:** Heading Printing - Aligning the Headings- Fonts-Forms.

UNIT V:

Ordered and Unordered Lists: Lists - Unordered Lists - Ordered Lists- **Table Handling:** Tables - Table Creation in HTML - Width of the Table and Cells- HTML Style Sheet.

Text Book

C Xavier, World Wide Web design with HTML, Tata McGraw-Hill Education, 22nd reprint, 2010.

Reference Book

1. Deitel and Deitel, Internet and World Wide Web - How to Program, PHI, Fourth Edition,2008.
2. Sanjay Saxsena, "A First Course in Computer", Vikas Publishing House, 5th Edition, 2000
3. Ron Mansfield, "Working in Microsoft Office",Tata Mcgraw Hill, 18th Reprint 2008.

Total Number of Topics Present in the course: 44

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	0	0
2	Regional	0	0
3	National	0	0
4	Global	44	100

Course Code: 18UCA4SBE1
Instruction Hours: 2
Credit: 2

Exam Hours: 03
External Marks: 75
Internal Marks: 25

SKILL BASED ELECTIVE 1
HARDWARE TROUBLESHOOTING

Objectives:

- To Understand the Basic concept of Hardware and networking
- To explain fundamentals of PC technology
- To list out a storage devices
- To classify the keyboards and pointing devices
- To troubleshoot printers

UNIT I:

Fundamentals of PC technology: Fundamental Building Blocks of the PC - Principles of CPU Operations - CPU family & operation.

UNIT II:

Motherboards: Motherboard Controllers and System Resources - The I / O System Bus - Onboard I / O Devices Power Supply- Cooling, and Protection: The Power Supply - Ventilation and Cooling Protection - Power Production and Backup.

UNIT III:

Magnetic Storage-Hard Disk Drives - **Optical Storage Devices:** Optical Storage Media - CD-ROM Drives - DVD-ROM Drives - **I/O Ports and Devices:** Serial Ports - Parallel Ports - Universal Serial Bus.

UNIT IV:

Keyboards and Pointing Devices: Keyboards- Pointing Devices- Modems and Communications: Modems- ISDN-CATV Network Modems-DSL- Networking: Networking Fundamentals - Network Hardware - Network Protocols.

UNIT V:

Printers: Types - Printer Attributes - Printer Maintenance - **Troubleshooting Tools and Techniques:** Tools of the Trade - Basic PC Handling Techniques.

Text Book

The Complete Reference PC Hardware: Craig Zacker, John Rourke – Tata McGrawHill, 18th Reprint, 2001.

Reference Books

1. Govindarajulu. B, IBM PC and clones : Hardware, Trouble shooting and Maintenance. Second edition, Tata-McGraw Hill, (ISBN 0-07-048286-1),2002.
2. Rosch. Winn L., Hardware bible, Sixth edition, Que/Techmedia publishers, 2003 (ISBN 81-7635-696-4).
3. Introduction to PC Hardware and Troubleshooting1st Edition, Michael Meyers (ISBN-13:978-0072226324), 2003.

Total Number of Topics Present in the course: 33

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	3	9.09
2	Regional	0	0.00
3	National	0	0.00
4	Global	30	90.91

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER - V

(For the candidates admitted from the academic year 2019-2020 onwards)

SEMESTER – V

Course Code: 18UCA5CC5
Instruction Hours: 5
Credit: 5

Exam Hours: 03
External Marks: 75
Internal Marks: 25

CORE COURSE 5 COMPUTER NETWORKS

Objectives:

- To understand the Design and Organization of Computer Networks.
- To explain the layering concepts in computer networks.
- To identify the functions of error detection and correction.
- To describe the operations of Network layer.
- To illustrate the functionalities of Transport layer.

UNIT I:

Overview and Physical Layer: Introduction- Data Communications - Networks - Network Types. - **Network Models:** TCP/IP Protocol Suite The OSI Model- **Bandwidth utilization:** Multiplexing -FDM - WDM - TDM- Spread Spectrum- **Transmission Media:** Guided Media-Unguided Media- **Switching:** Circuit Switched Network - Packet Switching - Datagram Networks.

UNIT II:

Error Detection and Correction: Introduction- Cyclic codes - Forward Error Correction- **Data link Control:** Data link layer Protocols- Simple protocol - Stop and wait protocol- Piggybacking - **Media Access Control:** Random Access- Controlled Access- **Wireless Networks:** IEEE 802.1- Bluetooth- Cellular Telephone- Satellite network.

UNIT III:

Network Layer: Packet Switching- Network layer performance- IPV4 Addresses- **Internet Protocol:** Datagram Format- Fragmentation-**Routing Algorithms:** Distance Vector Routing- Link State Routing- Path Vector Routing- IPV6 Addressing.

UNIT IV:

Transport Layer: Transport Layer Protocols - User Datagram Protocol-**TCP:** TCP Services -TCP features - Segment - Flow Control - Error Control- TCP Congestion Control.

UNIT V:

Application Layer: Introduction- Client Server Programming- World Wide Web- HTTP- FTP- Email- DNS.

Text Book

Data Communications and Networking, Behrouz A Forouzan, Tata McGraw Hill, Fifth Edition, 2013 .

Reference Books

1. Data Communications and Networks, AchyutGodbole and AtulKahate, McGraw Hill Education, 2nd Edition, 2011.
2. William Stallings, “Data and Computer Communications”, Eighth Edition, Pearson Education, 2011.
3. Larry L. Peterson, Bruce S. Davie, “Computer Networks: A Systems Approach”, Fifth Edition, Morgan Kaufmann Publishers Inc., 2011.

Total Number of Topics Present in the course: 52

S.No	Category (Local, Regional, National, Global)	No. of Topic covered	Percentage
1	Local	0	0
2	Regional	0	0
3	National	0	0
4	Global	52	100

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – V

Course Code: 18UCA5CC6
Instruction Hours: 5
Credit: 5

Exam Hours: 03
External Marks: 75
Internal Marks: 25

CORE COURSE VI DATA STRUCTURES AND ALGORITHMS

Objectives:

- To Understand the concept of Data Structures and Algorithm
- To define a structure of arrays, stack, queue
- To describe Tree concepts
- To illustrate sorting algorithm
- To state the Greedy and Backtracking algorithm

UNIT I:

Arrays: Axiomatization - Ordered Lists - Representation of Arrays- **Stacks and Queues:** Fundamentals - Evaluation of Expressions -Evaluating Postfix expression- Multiple Stacks and Queues- **Linked Lists:** Singly Linked List - Linked Stacks and queues - Polynomial addition.

UNIT II:

Trees: Basic Terminology - Binary Trees - Binary Tree Representations -Array representation of binary tree-Linked list representation of binary tree -Binary Tree Traversal - Threaded Binary Trees - Binary Tree Representation on Trees.- **Graphs:** Terminology - Graphs Representations - Traversals - Connected Components and Spanning Trees - **Shortest Paths:** Single Source All Destinations Shortest Path - All Pairs Shortest Paths - Transitive Closure.

UNIT III:

Introduction: Algorithms - Algorithm Specification - Pseudo code conventions - **Elementary Data Structures:** Priority Queues - Heaps, Heap Sort- **Divide and Conquer:** General Method - Binary Search - Finding the Maximum and Minimum - Merge Sort - Quick Sort.

UNIT IV:

Greedy Method: The General Method - Knapsack Problem - Job Sequencing with Deadlines -Optimal Storage on Tapes - Optimal Merge Patterns-**Dynamic Programming:** Travelling salesperson problem.

UNIT V:

Backtracking: The General Method - The 8 Queens Problem - Sum of Subsets - Graph Coloring - Hamiltonian Cycles- Knapsack Problem.

Text Books

- 1.
2. **Fundamentals of Data Structures** – Ellis Horowitz, SartajSahni , Galgotia Publications, 2nd Edition (Unit 1,Unit 2)
3. **Fundamentals of Computer Algorithms** – Ellis Horowitz, SartajSahni and Sanguthevar, Rajasekaran, Galgotia Publications,2nd Edition, 2008 (Unit 3, Unit 4, Unit 5)

Reference Books

1. Schaum's Outline Series to Data Structures, 3rd Edition, Seymour Lipschutz, TMH, 2014.
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, Data Structures & Algorithms, 4th Edition, Pearson Education, New Delhi, 2009.

Total Number of Topics Present in the course: 47

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	0	0.00
2	Regional	0	0.00
3	National	0	0.00
4	Global	47	100

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – V

Course Code: 18UCA5CC7
Instruction Hours: 5
Credit: 5

Exam Hours: 03
External Marks: 75
Internal Marks: 25

CORE COURSE VII RELATIONAL DATABASE MANAGEMENT SYSTEMS

Objectives:

- To know the Database system concepts.
- To define basic terminologies in Database system.
- To explain process involved in designing Database object.
- To describe storage and file structures.
- To explain how to secure distributed Database.

UNIT I:

Introduction to Databases: History and Evolution - Features of Databases -Applications of Databases -
Technical Tour of My SQL: An overview of My SQL Architecture - The My SQL engine.

UNIT II:

My SQL: SQL Basics - History of SQL -Overview of SQL - A SQL tutorial- Understanding SQL tutorial- My SQL Data types.

UNIT III:

My SQL operators: Arithmetic Operators - Comparison Operators - Logical Operators - Bit Operators - **My SQL Functions:** Math functions - Aggregate functions - String functions - Date and Time functions- Encryption function.

UNIT IV:

Working with Data bases and Tables: Creating Databases - Selecting databases for use - Deleting Databases - Creating Tables - Copy - Modify and Delete Tables - Obtaining Information about Databases - Tables and Fields - **Working with Data:** Inserting - Updating and Deleting Records - Retrieving Records.

UNIT V:

Joins: Types of Join - **Sub queries:** Sub Query - Types of Sub queries - Transactions - Transaction and ACID properties - Life cycle of Transaction - **Controlling Transactional Behavior** - Transactions and Performance - Administration and Configuration- Database Administration and MySQL- Security access control and Privileges.

Text Book:

My SQL Complete Reference – VikramVaswani, First Edition, Mc Graw Hill Publications.2004

Reference books:

1. **Database Management Systems** – ArunMajumdar&Pritimoy Bhattacharya, 1st Edition, 2007, TMH.
2. **Database System Concepts**, - Abraham Silberschatz, Henry Korth, and S. Sudarshan Sixth edition, McGraw-Hill.2011.
3. **Fundamentals of Database Systems** - R. Elmasri and S. Navathe, ,Sixth Edition, Pearson Education,2011.

Total Number of Topics Present in the course: 42

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	10	23.81
2	Regional	5	11.90
3	National	5	11.90
4	Global	22	52.38

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – V

Course Code: 18UCA5CP5
Hours: 4
Credit: 3

Exam Hours: 03
External Marks: 60
Internal Marks: 40

CORE PRACTICAL V PHP AND MYSQL LAB

Objectives:

- To impart practical training in PHP
- Programming Language.
- To create knowledge in web page creation using PHP.
- To enable the students to understand the use of PHP with MySQL.

PHP

1. Write a PHP script using various String handling functions.
2. Write a PHP script using Control flow statements.
3. Create a web page that implements the concept of functions.
4. Create a simple web page using object oriented programming concept.
5. Write a program in PHP that shows the use of Cookies.
6. Create a college application form for Thanthai Hans Roever College using necessary UI components
7. Develop a simple web page that implements the concept AJAX.
8. Write a PHP program for Webpage design
9. Write a PHP program using browser handling methods

MYSQL

1. Create a table and perform the following basic MYSQL operations
 - a) Alter the structure of the table
 - b) Insert values
 - c) Delete values based on constraints
 - d) Display values using various forms of select clause
 - e) Drop the table
2. Develop MYSQL queries to implement the following set operations
 - a) Union
 - b) Union all
 - c) Intersect
 - d) Intersect all
3. Develop MYSQL queries to implement the following aggregate functions
 - a) Sum
 - b) Count
 - c) Average
 - d) Maximum
 - e) Minimum
 - f) Group by clause & having clause
4. Write a PHP program using comparison operator.
5. Consider the following database for a banking enterprise
 - BRANCH(branch-name:string, branch-city:string, assets:real)
 - ACCOUNT(accno:int, branch-name:string, balance:real)
 - DEPOSITOR(customer-name:string, accno:int)
 - CUSTOMER(customer-name:string, customer-street:string, customer-city:string)
 - LOAN(loan-number:int, branch-name:string, amount:real)
 - BORROWER(customer-name:string, loan-number:int)
 - i. Create a table by properly specifying the primary keys and the foreign keys
 - ii. Enter at least five tuples for each relation
 - iii. Find all the customers who have at least two accounts at the *Main* branch.
 - iv. Find all the customers who have an account at *all* the branches located in a specific city.
 - v. Demonstrate how you delete all account tuples at every branch located in a specific city.
 - vi. Generate suitable reports.
 - vii. Create suitable front end for querying and displaying the results.

PHP and MYSQL

1. Write a program in PHP to connect to a database and retrieve records from a table.
2. Write a program in PHP to connect to a database and insert records into the table.
3. Write a program in PHP to connect to a database and update records in the table.
4. Write a program in PHP to connect to a database and delete records from the table.

Total Number of Topics Present in the course: 18

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	9	50.00
2	Regional	1	5.56
2	National	0	0.00
4	Global	9	50.00

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – V

Course Code: 18UCA5MBE1:1
Instruction Hours: 5
Credit: 5

Exam Hours: 03
External Marks: 75
Internal Marks: 25

MAJOR BASED ELECTIVE 1 PHP SCRIPTING LANGUAGES

Objectives:

- To understand the basic concepts of PHP .
- To derive advanced object-oriented programming concepts.
- To compare various file handling functions in PHP
- To explain how to read data from web pages.
- To state introductory concepts in AJAX

UNIT I:

Essentials of PHP : creating development environment - comments in php variables - **Operators and Flow Control:** Unary operators -Binary operators - control statements - loop control structures - Strings and Arrays - **Debugging exercises for factorial & Fibonacci series**

UNIT II:

Creating Functions: creating functions in php - passing data to function -default argument - returning array from functions - php variable functions - **Reading Data in Web Pages:** Text field - Text Area - Radio button - Image map - submit button - **PHP Browser Handling Power:** php server variables - validation - Advantages of PHP functions - Implementation of Palindrome using functions.

UNIT III:

Object-Oriented Programming: class - objects - Access Specifiers - constructor and destructor - Inheritance - overloading and overriding - Autoloading - **Advanced Object-Oriented Programming:** static members and methods - Abstract classes - Interfaces - class constants - cloning objects -Reflection - **Debugging exercise using Interfaces**

UNIT IV:

File Handling: Opening Files - feof(), fgets(), fclose(), fgetc(),file_get_contents() - Reading a file into an array with file() - file_exists() - filesize(), fread(),fscanf(), parse_ini_file(), stat(), fseek(), copy(), fwrite(), file_put_contents() - locking files -**Working with Databases:** Creating MySQL Database -Inserting data into database - Accessing the database in PHP -Reading the table - Displaying the table data, Updating , deleting the database - Sorting table data- Sessions - Cookies - FTP - - **Implementation of Aggregate functions in MySQL**

UNIT V:

Ajax : Introduction - How Ajax Works -AJAX with some PHP - Passing data to the server with GET - Passing data to the server with POST -Handling XML - Handling XML with PHP - Advanced Ajax - Drawing Images on the Server.

Text Book:

1. The PHP Complete Reference, Steven Holzner, McGraw Hill Education, 1st Edition, 2007

Reference Books:

1. PHP: A Beginner's Guide, VikramVaswani, McGraw Hill Education, 2nd Reprint, 2008.
2. Timothy Boronczyk,Martin E. Psinas,"PHP and MYSQL: Create -Modify –Reuse", Wiley India Private Limited, Reprint 2008.
3. Matt Doyle,"Beginning PHP 5.3", 2nd Edition, Wiley Publishing Inc., 2009

Total Number of Topics Present in the course: 63

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	3	4.76
2	Regional	1	1.59
3	National	1	1.59
4	Global	61	96.83

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – V

Course Code: 18UCA5MBE1:2
Instruction Hours: 5
Credit: 5

Exam Hours: 03
External Marks: 75
Internal Marks: 25

MAJOR BASED ELECTIVE 1 COMPUTER GRAPHICS

Objectives:

- To knowledge about fundamental concepts of Computer Graphics
- To illustrate two and three dimensional concepts and their applications
- To identify the various types of transformations.
- To describe matrix representation
- To explain Parallel and Perspective Projections.

UNIT I:

Overview of Graphics System: Computer Art - Entertainment - Education & Training - **Display Devices:** Image Scanner - Cathode Ray - Raster Scan - Random Scan. Input devices -Output Devices - Graphics Software.

UNIT II:

Output Primitives: Points and Lines - **Line Drawing Algorithms:** DDA Algorithm - Bresenham's Line Drawing Algorithms - **Attributes:** Line Attributes - Line color pen and brush option- Character Attributes - Area Fill Attributes.

UNIT III:

2D Transformations: Basic Transformations - Translation - Rotation, and Scaling - Matrix Representations - Homogeneous coordinates.

UNIT IV:

Composite Transformations: Translations-Rotation- Scaling -General Pivot- Point Rotation - General Fixed Point Scaling- General scaling direction- **Other Transformations:** Reflection - Shear.

UNIT V:

3D Transformations: Basic Transformations - Projections: Parallel and Perspective Projections - Depth Queuing.

Text Book:

1. Donald Hearn and M. Pauline Baker, Computer Graphics, Prentice Hall of India, 2nd Edition, Reprint 2007.

Reference Book:

1. William M. Newman and Robert F. Sproull, Principles of Interactive Computer Graphics, TMH, Second Edition, Reprint 2010.
2. Donald Hearn M. Pauline Baker, "Computer Graphics - C Version", 2nd Edition, Pearson Education, 2006
3. Donald Hearn and M. Pauline Baker, Computer Graphics with OpenGL, Second Edition, Prentice Hall, 2001.

Total Number of Topics Present in the course: 33

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	0	0
2	Regional	0	0
3	National	0	0
4	Global	33	100

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – V

Course Code: 18UCA5MBE1:3
Instruction Hours: 5
Credit: 5

Exam Hours: 03
External Marks: 75
Internal Marks: 25

MAJOR BASED ELECTIVE 1 DOT NET

Objectives

- To understand the basic concepts of DotNet.
- To explain the overview of framework.
- To classify different types of controls.
- To illustrate database concepts in DotNet with example.
- To explain how to work in web based applications.

UNIT I: Introduction: Dot net Framework-What the Heck in .NET any way? - **Dot Net Objects:** .Net namespaces-Assemblies-Object oriented programming features- Inheritance-Object constructors-.Net Memory management-Interoperation with COM-Transaction in .Net-Structured Exception Handling-Code Access Security.

UNIT II: Dot Net Web Service - Writing an XML web services-Self description of XML Web Services - The WSDL File- Writing XML Web Service Clients-XML Web service support in Visual studio .Net- XML Web service Design considerations- XML Web Service Security- XML Web Service Enhancements- **Windows Forms:** controls and Events - Hosting ActiveX controls in Windows forms - Form enhancements- Drawing- Mouse handling - Menu handling - keyboard Handling - Dialog Boxes.

UNIT III: Data Access in Dot Net: disconnected operation- Visual Studio Support and Typed dataset objects - **Handling XML:** Background- Architecture- Basic Serialization - Controlling Serialization - XML Schema Serialization - Generic Parsing.

UNIT IV: Events and Delegates- simplest Example- More complex Example- Delegates - **Threads:** Using the process Thread Pool-Thread Safety-Managing Your own threads- complex threading sample program.

UNIT V: Dot Net Remoting- Configuration Files- Activation Types- Life time Management- Hosting and Deployment -Security- Authorization-Performance - **Dot Net Reflection:** Simplest Example- Enumerating types-Object creation and method Invocation.

Text Book

David S Platt, “Introducing Microsoft .Net”, Prentice Hall of India, New Delhi,2003.

Reference Book

1. David Chappell, Understanding .Net, Addison-Wesley Professional; 2 Edition,2006.
2. PRO C# 2010 and .NET 4 platform by Andrew Troelsen Apress publication, 5th Edition, 2010.
3. Beginning ASP.NET 4: in C# and VB by Imar Spaanjaars Wrox Publication., 1st Edition, 2013.

Total Number of Topics Present in the course: 53

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	2	3.77
2	Regional	0	0.00
3	National	1	1.89
4	Global	50	94.34

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – V

Course Code: 18UCA5SBE2
Instruction Hours: 2
Credit: 2

Exam Hours: 03
External Marks: 75
Internal Marks: 25

SKILL BASED ELECTIVE - 2 RUBY ON RAILS

Objectives:

- To understand the basic concepts of ruby on Rails.
- To explain how to create web applications.
- To describe classes and objects.
- To estimate view controller architecture in Rails.
- To explain about Database concept in Rails.

UNIT I:

Welcome to Ruby: Creating a First Web Application-Getting started with Ruby- Checking the Ruby Documentation-Working with Numbers in Ruby-Working with Strings in Ruby-Storing Data in Variables-Creating Constants-Interpolating Variables in Double Quoted Strings-Reading Text on the Command Line-Creating Symbols in Ruby-Working with Operators-Handling Operator Precedence- Working with Arrays-Using Two Array Indices.

UNIT II:

Conditionals, Loops, Methods and Blocks: It's All about Making choices: the if Statement- Using else clauses-Using elsif Clauses- Using the case Statement-Using Loops-Creating and Calling a Method.

UNIT III:

Classes and Objects: All about Encapsulation-Creating a Class-Creating an Object- Basing one Class on Another-Understanding Ruby's Object Access-Overriding Methods-Creating Class Variables-Creating Class Methods- Creating Modules.

UNIT IV:

Welcome to Rails: Putting Ruby on Rails-Introducing Model View Controller Architecture-Giving the view Something to do-Mixing Ruby Code and HTML inside the View-Passing Data from an Action to a View-Escaping Sensitive Text-Adding a Second Action- Selecting Which view to Render.

UNIT V:

Connecting to Databases: Creating a Data-Aware Rails Application-Creating a Database-Running the store Application-Adding Another Record-Beautifulizing a Display-**Working with Databases:** Displaying items to the customer-Creating a Shopping Cart- Creating the Purchase Model- Creating Cart.

Text Book:

1. Beginning Ruby on Rails by Stephen Holzner, Wiley India Publications, Reprint 2007.

Reference Book:

1. Ruby on Rails: Up and Running by Bruce A. Tate, Curt Hibbs, O'Reilly Media Publications, 1st Edition, 2006.
2. The Book of Ruby, Huw Collingbourne, No Starch Press Publications, 1st Edition 2011.
3. Carlson, Leonard Richardson, "Ruby Cookbook", O'Reilly Media, 2nd Edition, 2006.

Total Number of Topics Present in the course: 47

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	5	10.64
2	Regional	2	4.26
3	National	0	0.00
4	Global	40	85.11

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER V

Course Code: 18UCA5SBE3
Instruction Hours: 2
Credit: 2

Exam Hours: 03
External Marks: 75
Internal Marks: 25

SKILL BASED ELECTIVE 3 - WEB SERVICES

Objectives:

- To understand the basic concept of web service.
- To define client –server architecture.
- To describe Mark-up Language.
- To illustrate a SOAP model.
- To classify various types of protocol.

UNIT I:

Introduction: Services-Web Services - Web Services Application Opportunities- **Emergence of Web Service:** Server-side Architecture Progression- Mainframe Architecture - Client-Side Architecture -Client-Side Architecture Progression- Dumb Terminal – Thick Clients -Service Oriented Architecture and Web Services

UNIT II:

Web Services Application Scenario: Web Services Hype and the Industry-Web Services and the Industry Acceptance- SCM - CRM .**Extensible Markup Language:** History of Markup Languages-What is XML?.

UNIT III:

Validation of XML Data-Advanced XML-Document Constraining- Namespaces - XML schema .**Simple Object Access Protocol:** Background-What is SOAP? - SOAP Interaction-SOAP Modeling - SOAP Encoding-SOAP Binding.

UNIT IV:

Web Services Description Language: What is WSDL-Web Service Invocation and WSDL-Web Services Description Details-Service Description through WSDL Registries - **Universal Description Discovery and Integration:** What is UDDI-UDDI Nomenclature-- Node API sets-UDDI Node- Registries – Data structure?

UNIT V:

Core UDDI-Service Publication-Service Discovery-**Remote Procedure Call and Messaging:** Synchronous Web Services-Asynchronous Web Services - Remote Procedure Call or Messaging- **Orchestration and Choreography** : Business process Work flow.

Text Book

1. Web Services: An Introduction by B.V. Kumar and S.V. Subramanian, Tata McGraw Hill Publications, 5th Edition, 2008.

Reference Books

1. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services", Pearson Education, 2nd Edition, 2004.
2. Frank. P. Coyle, XML, Web Services And The Data Revolution, Pearson Education, 5th Edition, 2007.
3. Robert. W.Sebesta, "Programming the World Wide Web", Pearson Education, Fourth Edition, 2007.

Total Number of Topics Present in the course: 44

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	0	0
2	Regional	0	0
3	National	0	0
4	Global	44	100

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER - VI

(For the candidates admitted from the academic year 2019-2020 onwards)

SEMESTER – VI

Course Code: 18UCA6CC8
Instruction Hours: 6
Credit: 6

Exam Hours: 03
External Marks: 75
Internal Marks: 25

CORE COURSE VIII OPERATING SYSTEMS

Objectives:

- To know the fundamental aspects of various management in Operating Systems
- To describe various memory management techniques
- To explain about process management
- To state about device management
- To illustrate the information management

UNIT I:

Introduction: Importance of Operating System - Basic concepts and Terminology - An OS Resource Manager - Process Viewpoint - Hierarchical View and Extended Machine View - Other views of OS - I/O Programming - Types of I/O Channels- Interrupt Programming - Machine Structure.

UNIT II:

Memory Management: Single Contiguous Allocation - Partitioned Allocation- Static Partition - Dynamic Partition - Relocatable Partitioned Memory Management - Paged Memory Management- Demand Paged Memory Management - Segmented Memory Management -Segmented and Demand paged Memory Management - overlay Techniques -Swapping.

UNIT III:

Processor Management: State Model - Job Scheduling - Process Scheduling - Functions and Policies - Evolution of Round Robin Multiprogramming Performance - Process Synchronization - Race Condition -Wait and Signal mechanisms - Semaphores P&V Operations - Deadlock - Banker's Algorithm.

UNIT IV:

Device Management: Techniques for Device Management - Device Characteristics - Hardware Considerations - Serial Access Device -Channels and Control Units - I/O Traffic Controller - I/O Scheduler - I/O Device Handler -Spooling.

UNIT V:

Information Management: Simple File System - General Model of File System - Symbolic File System - Basic File System - File Directory Database - Logical File System - Physical File System. **Case Studies:** MSDOS-UNIX.

Text Book

Stuart E.Madnick, John J. Donovan “Operating Systems” McGraw-Hill International Edition, 18th Reprint, 2008.

Reference Books

1. A.Silberschatz P.B.Galvin,Gange., “Operating System Principles”, 7th Edition, John Wiley & Sons., 2006.
2. Harvey M. Deitel, “Operating Systems”, Pearson Education Pvt. Ltd, Second Edition, 2002.
3. William Stallings, “Operating System”, Pearson Education, Sixth edition, 2012.

Total Number of Topics Present in the course: 49

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	0	0
2	Regional	0	0
3	National	0	0
4	Global	49	100

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – VI

Course Code: 18UCA6CC9
Instruction Hours: 6
Credit: 6

Exam Hours: 03
External Marks: 75
Internal Marks: 25

CORE COURSE VIII SMART DEVICE PROGRAMMING

Objectives:

- To familiarize the students with Operating Systems for Mobile devices and to impart skills for Mobile Application Development.
- To understand the Android software development
- To enable to write Android apps

UNIT I:

Android Overview: Android Overview- Open Source Platform -History-Android Versions -Android Flavors-
The Stack: Stack Overview-Linux-Native Libraries-Dalvik -Application Framework-Applications - **Quick Start:** Installing the Android SDK -Hello, World -The Emulator - **Main Building Blocks:** What Are Main Building Blocks?-A Real World Example-Activities- Intents -Services -Content Providers- Broadcast Receivers- Application Context

UNIT II:

Android User Interface: Two Ways to Create a User Interface - Declarative User Interface-Programmatic User Interface-Views and Layouts - Starting the Yamba Project - The StatusActivity Layout -The StatusActivity Java Class -Logging in Android - Threading in Android - Other UI Events- Adding Color and Graphics -Alternative Resources-Optimizing the User Interface -**Preferences, the Filesystem, the Options Menu, and Intents:** Preferences -The Options Menu -Shared Preferences -The Filesystem

UNIT III:

The Database: SQLite DBHelper- The Database Schema and Its Creation - **First Example-** Update UpdaterService -Refactoring Status Data -**Lists and Adapters:** TimelineActivity -Basic TimelineActivity Layout- About Adapters -TimelineAdapter -**ViewBinder:** A Better Alternative to TimelineAdapter -Updating the Manifest File -Base Activity

UNIT IV:

Broadcast Receivers: About Broadcast Receivers-BootReceiver- Registering the BootReceiver with Android Manifest File- The TimelineReceiver -Broadcasting Intents -The Network Receiver -Adding Custom Permissions to Send and Receive Broadcasts - **Content Providers:** Creating a Content Provider -Using Content Providers Through Widgets

UNIT V:

System Services: Compass Demo -Location Service -Updating Yamba to Use the Location Service -Intent Service -Sending Notifications- Introducing IntenetService-**The Android Interface Definition Language:** Implementing the Remote Service -Implementing the Remote Client.

Text Book

Learning Android Building Applications - Marko Gargenta, Oriley publications, 1st edition , 2011.

Reference Books

1. Android Application Development – Lauren Darcey et al – Pearson ,1st Edition,2012.
2. Jochen Schiller, “Mobile Communications”, PHI/Pearson Education, Second Edition, 2003.
3. RAJ KAMAL, “Mobile Computing,” second edition, Oxford, 2008

Total Number of Topics Present in the course: 68

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	3	4.41
2	Regional	0	0.00
3	National	0	0.00
4	Global	65	95.59

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – VI

Course Code: 18UCA6CP6
Instruction Hours: 5
Credit: 4

Exam Hours: 03
External Marks: 60
Internal Marks: 40

CORE PRACTICAL VI SMART DEVICE PROGRAMMING LAB

Objectives:

- To impart practical training in smart device programming and XML Programming.
- To create knowledge in SMS application.
- To make them to learn Android layouts, views and events.

List of Programs

1. Create a simple screen which displays “Hello World”.
2. Create a screen to accept your name, date of birth and display age. The date widget must be used.
3. Demonstrate the passing of data between activities.
4. Display the phone numbers from the phone book using your own application.
5. Create a simple SMS application.
6. Create an Application which deals with the Android Content Providers
7. Create an android application with login page and a home page
8. Create Application using Android Layouts, Views and Events
9. Create Application which uses the concept of Services and Background Threats
10. Create an android applications using fragments
11. Design an android application using Radio buttons.

Total Number of Topics Present in the course: 11

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	6	54.55
2	Regional	0	0.00
3	National	0	0.00
4	Global	5	45.45

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global,

SEMESTER – VI

Course Code: 18UCA6MBE2:1
Instruction Hours: 5
Credit: 4

Exam Hours:03
External Marks: 60
Internal Marks: 40

MAJOR BASED ELECTIVE I

CLOUD COMPUTING

Objectives:

- To understand the basic concepts in Cloud Computing and its Security.
- To list about the type cloud computing.
- To classify the various type of data sets.
- To determine the High Performance Computing Clusters.
- To explain about Enterprise Knowledge cloud.

UNIT I:

Cloud Computing Basics: Cloud Computing Overview - Applications - Internets and the Cloud - First Movers in the Cloud - **Organization and Cloud Computing:** Benefits - Limitations - Security concerns.

UNIT II:

Cloud Computing with Titans: Google - Google App Engine - EMC - NetApp- Microsoft - Amazon - IBM- Partnerships.

UNIT III:

The Business Case for Going to the Cloud: Cloud Computing Services - Salesforce.com - Thomson Reuters - **Hardware and Technology:** Clients - Security - Network - Services

UNIT IV:

Accessing the Cloud : Platforms - Web Applications - Web APIs - Web Browsers - **Cloud Storage:** Overview - Cloud Storage Providers

UNIT V:

Software as a Service: Overview - Driving Forces - Company Offerings - Industries - **Developing Applications:** Google - Microsoft

Text Book:

Anthony T.Velte, Toby J.Velte and Robert Elsenpeter, **Cloud Computing - A Practical Approach**, Tata McGraw Hill Education Pvt Ltd, 2010.

Reference Books:

1. BorkoFurht , Armando Escalante ,**Hand Book of Cloud Computing** - Springer, 1st Edition, 2010.
2. Syed A. Ahson, Mohammad Ilyas, **Cloud Computing and Software Services** - CRC Press 1st Edition, 2015.

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	2	5.88
2	Regional	0	0.00
3	National	0	0.00
4	Global	32	94.12

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – VI

Course Code: 18UCA6MBE2:2
Instruction Hours: 6
Credit: 6

Exam Hours: 03
External Marks: 75
Internal Marks: 25

MAJOR BASED ELECTIVE 2 **MOBILE COMMUNICATION**

Objectives:

- To Understand basic concept of Mobile Communication
- To define the architecture of WLAN
- To state the Mobile network layer
- To distinguish the layer in network
- To explain 3G and 4G technologies

UNIT I: WIRELESS LAN

Introduction WLAN technologies: Infrared- UHF narrowband- spread spectrum -IEEE 802.11: System architecture- protocol architecture- physical layer- MAC layer- 802.11b- 802.11a - Hiper LAN: WATM-BRAN- HiperLAN2 - **Bluetooth:** Architecture- Radio Layer- Baseband layer- Link manager protocol- security- L2CAP - SDP.

UNIT II: MOBILE NETWORK LAYER

Introduction Mobile IP: IP packet delivery- Agent discovery- Registration- Tunneling and encapsulation- Optimization- Reverse tunneling- IPV6-IP micro - mobility support- Dynamic Host Configuration Protocol- **Mobile ad hoc network:** Routing- Destination Sequence distance vector- Dynamic source routing- Alternative metrics- Overview ad hoc routing protocols.

UNIT III: MOBILE TRANSPORT LAYER

TCP enhancements for wireless protocols - **Traditional TCP:** Congestion control- fast retransmit/fast recovery- Implications of mobility - **Classical TCP improvements:** Indirect TCP- Snooping TCP- Mobile TCP- Time out freezing- Selective retransmission- Transaction oriented TCP - TCP over 3G wireless networks- **Support for mobility :** File system-coda - little work- World Wide Web- **Wireless Application Protocol:** Architecture- Wireless datagram protocol- wireless transport layer security- wireless transaction protocol- wireless session protocol- wireless application environment- Wireless markup language- WML script- Push architecture

UNIT IV: WIRELESS WIDE AREA NETWORK

Overview of UTRAN Terrestrial Radio access network-UMTS Core network Architecture: 3G-MSC- 3G-SGSN- 3G-GGSN- SMS-GMSC/SMS-IWMSC- Firewall- DNS/DHCP- QOS in UMTS-High speed Downlink packet access (HSDPA) - Wide Area Wireless Network: Introduction- cdma2000 Layering Structure- Forward Link Physical Channels of cdma2000- Forward Link Features- Transmission diversity - Orthogonal modulation.

UNIT V: WLAN 3G & 4G NETWORKS

Interworking between Wireless Local Area Networks and 3G Wireless Wide Area Networks - Introduction - 4G vision - 4G features and challenges - Applications of 4G - 4G Technologies: Multicarrier Modulation- Smart antenna techniques- OFDM MIMO systems- Adaptive Modulation and coding with time slot scheduler- Cognitive Radio- Software Defined radio.

Text Books

1. Jochen Schiller, "Mobile Communications", Second Edition, Pearson Education 2008(Unit I,II,III)
2. Vijay Garg, "Wireless Communications and networking", First Edition, Elsevier 2007.(Unit IV,V)

Reference Books

1. Erik Dahlman, Stefan Parkvall, Johan Skold and Per Beming, "3G Evolution HSPA and LTE for Mobile Broadband", Second Edition, Academic Press, 2008.
2. Anurag Kumar, D.Manjunath, Joy kuri, "Wireless Networking", First Edition, Elsevier 2011.
3. Simon Haykin, Michael Moher, David Koilpillai, "Modern Wireless Communications", 1st Edition, 2011.

Total Number of Topics Present in the course: 89

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	0	0
2	Regional	0	0
3	National	0	0
4	Global	89	100

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global,

SEMESTER – VI

Course Code: 18UCA6MBE2:3
Instruction Hours: 6
Credit: 6

Exam Hours:03
External Marks: 75
Internal Marks: 25

MAJOR BASED ELECTIVE 2 XML PROGRAMMING

Objectives:

- To comprehend basic knowledge and Programming skills in XML.
- To determine Document Type Definition in XML.
- To draw how to validate XML documents using XML Schema.
- To design web page using Cascading Style Sheet
- To find XSL Transformations.

UNIT I:

Getting a Global Perspective: The early beginnings - The Current Standards-XML Software- **Reviewing XML Validating and Non validating Parsers:** Getting XML Documents Written - XML Non validating Parsers - Validating Parsers - **Saying “Hello World” in XML:** XML structure- XML elements- writing your first document- parsing your document- using layers of elements- commenting your XML code- Data structure and organization.

UNIT II:

Organizing XML Data: Creating Layers of information from your data - Structuring your data- Ensuring that your data works with the Document Object Model (DOM) - **Creating Well-Formed XML:** Document Basics - Creating and Describing Elements - Child Elements - **Adding Attributes:** Using attributes to Enhance Elements - Attribute rules - Using attributes to Enhance empty Elements- Sharing attributes- Using style sheet with attributes- **XML Namespaces:** What are Namespaces?- Using Namespaces within Documents- Adding name space to DTDs.

UNIT III:

Validating your XML Documents: DTDs and validation - Adding DTDs to your Documents - PUBLIC Versus SYSTEM DTDs - declaring Element types -Controlling element content - adding comments- **Defining DTD Entities:** Understanding Entities - Defining General Entities - Defining parameters entities

UNIT IV:

Working with Attributes: Delving into attributes - attribute or element? - defining attributes- defining multiple attributes - using predefined attributes - **Introducing Schemas:** What are schemas?- Comparing DTDs and schema - **Writing a basic schema** -What software is available?

UNIT V:

Schema Elements Types and Groups: Schema element Descriptions - Element Types- Using Groups of elements- Element content - **Defining Schema Attributes:** Schema attributes description -using schema annotations - using constraints- **creating unique elements and attributes** - **Advanced Concepts with Schema:** Target namespaces and schemas - undeclared target namespaces - schema constraints versus ID attributes-global VS local declarations- **using schemas as Multiple documents-** Substitution groups- abstract elements and types.

Text Book:

1. Heather Williamson, “XML:The Complete Reference”, McGraw-Hill, 1st Edition, 2001.

Reference Books:

1. William R.Stanek , “XML Pocket Consultant”, Prentice Hall, 1st Edition, 2002.
2. Sandra E.Eddy& John E.Schnyder “Teach Yourself XML”, IDG Books India (P) Ltd, 2nd Edition, 2002.

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	9	14.75
2	Regional	0	0.00
3	National	0	0.00
4	Global	52	85.25

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – VI

Course Code: 18UCA6MBE3:1
Instruction Hours: 6
Credit: 6

Exam Hours:03
External Marks: 60
Internal Marks: 40

MAJOR BASED ELECTIVE 3 MINI PROJECT

Mini Projects must be implemented using latest technology.

- All UG final year students have to carry out their mini project in the college itself.
- The objective of the mini project is to enable the students to work as group.
- Each group is limited to maximum of four students.

Total Number of Topics Present in the course:

S.No	Category (Local, Regional, National, Global)	Percentage
1	Local	40
2	Regional	20
3	National	20
4	Global	20

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.

SEMESTER – VI

Course Code: 18UCA6MBE3:2
Instruction Hours: 6
Credit: 6

Exam Hours: 03
External Marks: 60
Internal Marks: 40

MAJOR BASED ELECTIVE 3 LINUX LAB

Objectives:

- To impart practical training in Shell Programming.
- To gain knowledge in Linux commands.
- To familiar with Linux Environment.

Write Shell scripts for the following

1. Write a shell program, which accepts the name of a file from the standard input and performs the following tests on it:
 - a. File existence
 - b. File readable
 - c. File writeable
 - d. Both readable and writeable
2. Write a shell program using 3 arguments to take the pattern as well as input and output file names. If the pattern is found display "Pattern found" else display "Error message". Also check if right number of arguments is entered.
3. Write a shell program- which accepts the name of the file from the standard input and then performs the following tests on it:
 - a. Enter the 5 names in a file
 - b. Sort the names in existing file
 - c. List unsorted and sorted file
 - d. Quit
4. Write a menu driven shell program to copy- edit- rename- and delete a file.
5. Write a menu driven shell program to perform the following tasks
 - a. Enter the sentence in file
 - b. Search a given whole word in an existing file
 - c. Quit
6. Write a shell script to display the result "PASS" or "FAIL" using the information given below: Student Name- Student Register Number- Mark1- Mark2- Mark3 and Mark4. The minimum pass for each subject is 50.
7. Write a menu driven shell script for converting all the capital letters in a file to small case letters and vice versa.
8. Write a shell script to merge the contents of three given files- sort them and display the sorted output on the screen page by page.
9. Write a shell script to check whether a given string is Palindrome or not.
10. Write a Program for shell script to count the numbers character given strings
11. Write a Program for shell script to find the factorial of given number.

Total Number of Topics Present in the course: 11

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	8	72.73
2	Regional	0	0.00
3	National	0	0.00
4	Global	4	36.36

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global,

SEMESTER – VI

Course Code: 18UCA6MBE3:3

Instruction Hours: 6

Credit: 6

Exam Hours: 03

External Marks: 60

Internal Marks: 40

MAJOR BASED ELECTIVE 3 DOT NET LAB

Objectives:

- To impart practical training in DOT NET Programming Language.
- To make the student to be familiar with database operations from dotnet.
- To develop knowledge in various components in dotnet.

List of Programs

1. Design ASP.Net web form using Html Server Controls to enter job seeker's details.
2. Create an ASP.Net web form using Web control to enter E-Mail registration form.
3. Apply appropriate validation techniques in E-Mail registration form using validation controls.
4. Write an ASP.Net application to retrieve form data and display it the client browser in a table format.
5. Create a web application using ADO.Net that uses which performs basic data manipulations:
(i). Insertion (ii) Updating (iii) Deletion (iv) Selection
Hint: Do operations using MS-Access and SQL-Server
6. Create an application using Data grid control to access information's from table in MS Access.
7. Create an application using Data list control to access information's from table in MS Access and display the result in neat format.
8. Write a program to declare class 'Distance' have a data member's dist 1, dist 2, and dist 3. Initialize the two data members using constructor and store a addition in third data member using function and display addition.
9. Write a program using function overloading to swap two integer numbers and swap two float numbers

Case Studies (Must include basic database operations such as Insertion, Deletion, Modification, Selection and Searching)

1. Job Search Portal.
2. College Portal.
3. Company Portal.

Total Number of Topics Present in the course: 9

S.No	Category (Local, Regional, National, Global)	No. of Topics covered	Percentage
1	Local	2	22.22
2	Regional	6	66.67
3	National	2	22.22
4	Global	1	11.11

Green-Local, **Pink** – Regional, **Blue** – National, **Brown** – Global.