POST GRADUATE DEPARTMENT OF COMPUTER SCIENCE

VALUE ADDED COURSES - With effect from 2024 - 2029

We are in the Modern era. Technology affects us in Waves. So, we have to update our knowledge every now and then. We are in need of witnessing a remarkable growth and development of Computer technology and applications in every field. As per the guidelines of the University Grant Commission (UGC), Tamil Nadu State Council for Higher Education (TNSCHE) and Mother Teresa Women's University, Kodaikanal and according to the current realities and emerging trends, the Department of computer science provides the following courses, which will enable the students with job opportunities.

a) POST GRADUATE DIPLOMA IN COMPUTER APPLICATION (PGDCA)

This course provides an overall knowledge in Computer Applications to beginners in IT World. A student can take this course in addition to her P.G. degree.

Eligibility: A Candidate should possess a Bachelor's Degree of any university to get admission to do this course **(part - time).**

Duration: It is divided into two Semesters of **One Year** duration.

b) DIPLOMA IN COMPUTER APPLICATION (DCA)

This Course helps a student to gain more knowledge in the World of Computers by providing the necessary skills to operate and maintain a Personal Computer and knowledge on Office Automation and Web Designing. A student can take this course in addition to her degree course. Students can earn 3 credits by doing this course.

Eligibility: A candidate should have passed her Higher Secondary or Equivalent.

Duration: Students shall undergo this course of study for a period of one year.

c) DIPLOMA IN DESK TOP PUBLISHING (DTP)

The Certificate course in Desk Top publishing helps a student, to obtain necessary skills to operate and maintain a personal computer and provides knowledge on office automation with Adobe Page Maker and InDesign. Also, Photoshop and CorelDraw aim to enable the student to produce a broad range of documents including newsletters, product leaflets, adverts, posters and sales material for either internal use or for commercial printing. With the help of this course, students can be web developer who can create web pages, publishers who will create brilliant vector graphics and full potential graphic designer. They will examine how to create, modify, print, and save illustrations containing graphics and text. It will be very useful to get a job in companies and Offsets. Students can earn 2 credits by doing this course.

Eligibility: A candidate should have passed her Higher Secondary or Equivalent.

Duration: Students shall undergo this course of study for a period of one year.

d) SKILL DEVELOPMENT PROGRAMS

Eligibility: A candidate should have passed her Higher Secondary or equivalent. A candidate enrolled in any degree in the college can also earn more credits by doing this course along with her regular degree.

i. Computer Maintenance Hardware and Networking

Computer hardware is an intriguing field of computer science and candidates who seek application careers in this field will have to pursue hardware and networking courses. This Skill Development Program in Computer Maintenance Hardware and Networking comprises of various courses related to computer organization, electrical and electronics circuits. Candidates pursuing this Skill Development Program also learn about the different parts of computers and how they function. The course enables them to figure out and fix hardware and network issues related to computers and other such devices. JAC Computer Science department offers a Skill Development Program in Computer Maintenance Hardware and Networking. Students can earn 2credits by doing this course.

ii. Open Source Web Development With LAMP

The most important thing about LAMP is that it is entirely open-source. Its components are freely available to anyone who might wish to use them - allowing webmasters to easily avoid vendor lock-in and develop for the web without having to put a large portion of their budget towards said development. It enables the students to take up a suitable career in the Computer Industry and related areas of computer applications or pursue higher education. Students can earn 2 credits by doing this course.

e) ONLINE SKILL DEVELOPMENT COURSES

Eligibility: A candidate should have passed her Higher Secondary or equivalent. A candidate enrolled in any degree in the college can also earn more credits by doing this course along with her regular degree.

Any student can enroll themselves for the course in Online. Final examination will be conducted in ONLINE mode by the CoE office for those who have registered themselves by paying exam fee.

BASIC COURSES: Basic courses are **SIX** weeks courses with 30 hours and 2 credits. Python Fundamentals, R for Beginners, Laravel for Beginners and Crash course on React JS are offered in basic level.

ADVANCED COURSES: Advanced courses are **TWELVE** weeks courses with 60 hours and 4 credits. Advanced Programming in Python, Advanced Analytics using R, Data Analytics with Python and Full stack Web Development Bootcamp are offered in advanced level.

PATTERN OF EVALUATION FOR PGDCA

For each paper, there will be continuous internal assessment (CIA) and Semester Examination (External). The Weightage ratio is

Paper	Internal	External	Total
Theory	25	75	100
Practical	40	60	100

Components for the Continuous Internal Assessment(CIA) Theory:

Component	Marks	Marks
Internal test I	40	Converted to 25
Internal test II	40	
Seminar	10	
E-Material Preparation (PPT)	5	
Attendance	5	
Total	**100**	**25**

The Internal Components are:

Practical	
Internal Test(2)	15
Lab Work	10
Record	10
Attendance	05
Total	**40**

Passing Minimum

Semester Examination	
Theory	50% out of 75 Marks (i.e. 37.5 Marks)
Practical	50% out of 60 Marks (i.e. 30 Marks)

PATTERN OF EVALUATION FOR DIPLOMA AND SKILL DEVELOPMENT PROGRAM

For each paper there will be continuous internal assessment (CIA) and Semester Examination (External). The Weightage ratio is

Paper	Internal	External	Total
Theory	25	75	**100**
Practical	40	60	**100**

Components for Continuous Internal Assessment (CIA) - Theory

Component	Marks	Marks
Internal test I	40	Converted to 25
Internal test II	40	
Online Quiz	10	
Assignment	10	
Total	**100**	**25**

Components for Continuous Internal Assessment (CIA) - Practical

Component	Mark
Internal Test (2)	15
Lab Work	10
Record	10
Attendance	05
Total	**40**

Passing Minimum

Semester Examination	
Theory	40% out of 75 Marks (i.e. 30 Marks)
Practical	40% out of 60 Marks (i.e. 24 Marks)

PATTERN OF EVALUATION FOR ONLINE SKILL DEVELOPMENT COURSES

For each course, there will be continuous internal assessment (CIA) and Final Examination (External). The Weightage ratio is

Paper	Internal	External	Total
Basic Courses	25	75	**100**
Advanced Courses	40	60	**100**

Components for Continuous Internal Assessment (CIA) - Basic Courses

Component	Marks	Marks
Online Quiz (6)	60	Converted to 25
Assignment (2)	20	
Assessment (2)	20	
Total	**100**	**25**

Components for Continuous Internal Assessment (CIA) - Advanced Courses

Component	Marks	Marks
Online Quiz (10)	50	Converted to 40
Assignment (2)	20	
Assessment (2)	20	
Case Study	10	
Total	**100**	**40**

Passing Minimum

Semester Examination	
Basic Courses	40% out of 75 Marks (i.e. 30 Marks)
Advanced Courses	50% out of 60 Marks (i.e. 30 Marks)

Question Patterns for PGDCA

INTERNAL QUESTION PATTERN

Time: 2 Hours **Max. : 40 Marks**

Course Outcome	Bloom's K-level	Q. No	Question Pattern
	K1-K2		SECTION - A (10 x 1 = 10 marks) MCQs
	K4-K6		SECTION - B (2 × 5= 10 Marks) Answer ALL Questions. (Internal Choice)
	K2-K3		SECTION - C (2x 10 =20 Marks) Answer All Question. (Internal Choice)

External Question Pattern for the courses carrying credits below 5

Time: 2 $\frac{1}{2}$ Hours **Max.: 75 Marks**

Course Outcome	Bloom's K-level	Q. No	Question Pattern
	K1-K2		SECTION - A (15 x 1 = 15 marks) MCQs
	K4-K6		SECTION - B (5x 6 = 30 Marks) Answer All Question. (Internal Choice, one question from each Unit)
	K2-K3		SECTION - C (3x 10 =30 Marks) Answer All Question. (Internal Choice)

Note: Revised Bloom's Taxonomy Levels

Remembering - K1 **Understanding - K2** **Applying - K3**

Analyzing - K4 **Evaluating - K5** **Creating - K6**

QUESTION PATTERNS FOR DIPLOMA AND SKILL DEVELOPMENT PROGRAMMES

INTERNAL QUESTION PATTEREN

Class: **Time: 2 Hours**

Date: **Max.: 40 Marks**

Title of the Paper

Course Outcome	Bloom's K-level	Q. No	SECTION
			SECTION - A (10 x 1 = 10 marks) MCQs
			SECTION - B (2 × 5= 10 Marks) Answer ALL Questions. (Internal Choice)
			SECTION - C (2x 10 =20 Marks) Answer All Question. (Internal Choice)

EXTERNAL QUESTION PATTEREN

UG External Question Pattern for the courses carrying credits below 5

Class: **Time: 2 ½ Hours**

Date: **Max.: 75 Marks**

Title of the Paper

Course Outcome	Bloom's K-level	Q. No	SECTION
			SECTION - A (15 x 1 = 15 marks) MCQs
			SECTION - B (5x 6 = 30 Marks) Answer All Question. (Internal Choice, one question from each Unit)
			SECTION - C (3x 10 =30 Marks) Answer All Question. (Internal Choice)

QUESTION PATTERNS -ONLINE SKILL DEVELOPMENT COURSES

External Question Pattern - Basic Courses

Time: 1 Hours **Maximum Mark: 75**

It would be the multiple-choice questions of following type.

- YES/No OR True/false
- Odd one out
- Best answer
- Image-Based Multiple-Choice Question
- Single Select Multiple Choice Questions
- Multiple Select Questions

(Open Choice and at least one Question from each week)

External Question Pattern - Advanced Courses

Time: 2 Hours **Maximum Mark: 60**

It would be the multiple-choice questions of following type.

- YES/No OR True/false
- Odd one out
- Best answer
- Image-Based Multiple-Choice Question
- Single Select Multiple Choice Questions
- Multiple Select Questions

(Open Choice and at least one Question from each week)

PG PROGRAMME OUTCOMES

PO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO
1.	Install knowledge and evaluate analytically in their specific disciplines.
2.	Analyze and apply the acquired knowledge to solve the complex problems in professional and social life.
3.	Evolve new technologies in the specific discipline leading to innovation and employability.
4.	Develop critical thinking required to pursue research.
5.	Apply the computational skills, life skills to the challenging problems in life.
6.	Design and develop independent projects.

PROGRAMME SPECIFIC OUTCOMES

PSO. NO.	UPON COMPLETION OF THIS PROGRAMME THE STUDENTS WILL BE ABLE TO	PO Mapped
1.	Enrich knowledge on the emerging technologies through immersive learning and exploration.	PO1
2.	Develop the skill set for industry ready professionals and acquire flair on solving real world case studies.	PO1, PO2
3.	Competence to identify, analyze, design, optimize and implement system solutions using contemporary computing techniques.	PO2, PO3
4.	Empower the students with domain knowledge and adequate skills for employability and entrepreneurship and beneficial to the society.	PO3, PO5
5.	Pursue learning the cutting-edge developments in computing technology and contribute through socially relevant areas of research.	PO4, PO6

PGDCA COURSE PATTERN

(Affiliated to Mother Teresa University, Kodaikanal)

Sem.	Code	Title of the Paper	Hours	Credits
I	24PGDCA01	Problem Solving in C++	6	4
	24PGDCA02	Operating Systems	6	4
	24PGDCA03	Computer Organization	6	4
	24PGDCAP1	Programming in C ++ - Lab	6	3
	24PGDCAP2	Web designing lab - Lab	6	3
			30	**18**
II	24PGDCA04	Programming in Java	6	4
	24PGDCA05	Multimedia	6	4
	24PGDCA06	E- Commerce	6	4
	24PGDCAP3	Java Programming - Lab	6	3
	24PGDCAP4	Multimedia - Lab	6	3
			30	**18**
		TOTAL	**60**	**36**

PROBLEM SOLVING IN C++

Semester: I **Hours: 6**
Code : 24PGDCA01 **Credit: 4**

UNIT I

Principles of Object-Oriented Programming: A look at Procedure Oriented Programming - Object Oriented Programming Paradigm - Basic Concepts of Object-Oriented Programming - Benefits of OOP - Object Oriented Languages - Applications of OOP. **Beginning with C++:** What is C++- Application of C++ - A simple C++ Program - More C++ Statements - An Example with Class - Structure of C++ Program - Creating the Source File - Compiling and Linking. T**okens, Expression and Control Structures:** Tokens - Keywords - Identifiers and Constants - Basic Data types- User Defined Data Types - Storage Classes - Derived Data Types - Symbolic Constants - Type Compatibility- Declaration of Variables - Dynamic Initialization of Variable - Reference Variable - Operator in C++ - Scope Resolution Operator - Member Dereferencing Operators - Memory Management Operators - Manipulators - Type Cast Operator - Expressions and Their Types - Special Assignment Expressions - Implicit Conversions - Operator Overloading - Operator Precedence - Control Structures. **(18 Hours)**

UNIT II

Functions in C++: Introduction- The main function-Function Prototyping - Call By Reference - Return by Reference - Inline Functions- Default Arguments - Const Arguments - Recursion - Function Overloading - Friend & Virtual Function - Math Library Functions. Classes and Objects: Specifying a Class - Defining Member Functions - Making an Outside Function Inline - Nesting of Member Functions - Private Member Functions - Arrays within 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 - Local Classes. **(18 Hours)**

UNIT III

Constructors and Destructors: Introduction - Constructors - Parameterized Constructors - Multiple Constructors in Class - Constructors with Default Arguments - Dynamic Initialization of Objects - Copy Constructor - Dynamic Constructor - Constructing Two-Dimensional Arrays - Const Objects - Destructors. **Inheritance: Extending Classes:** Single Inheritance - Making a private member Inheritable - Multiple Inheritance - Multilevel Inheritance - Hierarchical Inheritance - Hybrid Inheritance - Virtual Base Class - Abstract Classes - Constructors in Derived Classes - Member Classes - Nesting of Classes.

(18 Hours)

UNIT IV

Managing Console I/O Operations: C++ Streams - C++ Stream Classes - Unformatted I/O Operations - Formatted Console 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 Modes - File Pointers and their Manipulations - Sequential Input and Output Operations - Updating a File: Random Access - Error Handling during File Operations - Command Line Arguments. **(18 Hours)**

UNIT V

Exception Handling: Basics of Exception Handling - Exception Handling Mechanism - Throwing Mechanism - Catching Mechanism - Rethrowing an Exception - Specifying Exceptions - Exceptions in Constructors and Destructors - Exceptions in Operator Overloaded Functions. **Manipulating Strings**: Creating (String) Objects - Manipulating String Objects - Relational Operations - String Characteristics - Accessing Characters in Strings - Comparing and Swapping.

(18 Hours)

BOOK FOR STUDY

1. **"Object Oriented Programming with C++",** E. Balagurusamy, Tata Mc-Graw Hill, 7th Edition, 2017.

   UNIT I: Chapters 1-3

   UNIT II: Chapters 4,5

   UNIT III: Chapters 6, 8

   UNIT IV: Chapters 10,11

   UNIT V: Chapters 13,15

BOOKS FOR REFERENCE

1. **"A Tour of C++",** D. BJarne Stroustrup, Second Edition, Kindle Edition, 2018.
2. **"C++ Programming: An Object-Oriented Approach",** Behrouz A. Forouzon, Richard F. Gilberg, 1st Edition, Kindle Edition, 2019.

OPERATING SYSTEMS

Semester: I **Hours: 6**

Code : 24PGDCA02 **Credit: 4**

UNIT I

Operating System Overview: Operating System Objectives and functions - The Evolution of Operating System - Major Achievements - Microsoft Windows Overview - Traditional/Unix Systems - Modern UNIX System - Linux. **Process Description and Control:** Process - Process States - Process Description - Process Control. **(18 Hours)**

UNIT II

Concurrency: Mutual Exclusion and Synchronization: Principles of Concurrency - **Mutual Exclusion:** Hardware Support - Semaphores - Message Passing - Readers/Writers Problem. **Concurrency:** Deadlock and Starvation: Principles of Deadlock - Deadlock Prevention - Deadlock Avoidance - Deadlock Detection - An Integrated Deadlock Strategy - Dining Philosophers Problem. **(18 Hours)**

UNIT III

Memory Management: Memory management requirements - Memory Partitioning-Paging - Segmentation. **Virtual Memory:** Hardware and Control Structures - Operating System Software. **(18 Hours)**

UNIT IV

Uniprocessor Scheduling: Types of Processor Scheduling - Scheduling Algorithms. **Multiprocessor and Real Time Scheduling:** Multiprocessor Scheduling - Real Time Scheduling. **I/O Management and Disk Scheduling:** I/O Devices - Organization of the I/O Function - Disk Scheduling. **(18 Hours)**

UNIT V

File Management: Overview - File Organization and Access - B-Trees - File Directories - File Sharing - Record Blocking - Secondary Storage Management. **Computer Security Threats:** Computer Security Concepts - Threats, Attacks, and Assets - Intruders - Malicious Software Overview - Viruses, Worms and Bots - Rootkits. **(18 Hours)**

BOOK FOR STUDY

1. **"Operating Systems Internals and Design Principles",** William Stallings, Pearson Education Pvt Ltd., 7th Edition, 2014.

   UNIT I: Chapters 1.1 - 1.3, 1.7 - 1.10, 2.1 - 2.4

   UNIT II: Chapters 4.1 - 4.3, 4.5, 4.6, 5.1 - 5.6

   UNIT III: Chapters 6.1 - 6.4, 7.1 - 7.2

   UNIT IV: Chapters 8.1 - 8.2, 9.1 - 9.2, 10.1 - 10.2, 10.5

   UNIT V: Chapters 11.1 - 11.7, 13.1 - 13.6

BOOKS FOR REFERENCE

1. **"Operating System",** Harvey M. Deitel, Paul J. Deitel, David R. Choffness, Pearson Education, 3rd Edition, Tenth Impression, 2013.
2. **"Operating System Concepts",** Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Wiley India (P) Ltd, 8th Edition, 2017.

COMPUTER ORGANIZATION

Semester: I **Hours: 6**

Code : 24PGDCA03 **Credit: 4**

UNIT I

Digital Logic: The Basic Gates - NOT, OR, AND - Universal Logic Gates - NOR, NAND - AND - OR - Invert Gates - Positive and Negative Logic. **Combinational Logic Circuits:** Boolean Laws and Theorems - Sum-of- Products Method - Truth Table to Karnaugh Map - Pairs, Quads, and Octets - Karnaugh Simplifications - Don't - care Condition - Product-of-sums Method - Product-of-sums Simplification. **(18 Hours)**

UNIT II

Data-Processing Circuits: Multiplexers - Demultiplexers - 1-of-16 Decoder - BCD-to-decimal Decoders - Seven-segment Decoders - Encoders - Exclusive-OR Gates - Parity Generators and Checkers - Magnitude Comparator. **(18 Hours)**

UNIT III

Number Systems and Codes: Binary Number System - Binary-to-decimal Conversion - Decimal-to-binary Conversion - Octal numbers - Hexadecimal Numbers - The ASCII Code - The Excess-3 code - The Gray code. **Arithmetic Circuits:** Binary Addition - Binary Subtraction - Unsigned Binary Numbers - Sign magnitude Numbers - 2's Complement Representation - 2's Complement Arithmetic - Arithmetic Building Blocks - The Adder-subtracter. **(18 Hours)**

UNIT IV

Clocks and Timing Circuits: Schmitt Trigger - 555 Timer-Astable - 555 Timer Monostable. **Flip-Flops:** RS FLIP-FLOPs - Gated FLIP-FLOPs - Edge-triggered RS FLIP-FLOPs - Edge-triggered D FLIP-FLOPs - Edge-triggered JK FLIP-FLOPs - FLIPFLOP Timing. **(18 Hours)**

UNIT V

Registers: Types of Registers - Serial In-Serial Out - Serial In-Parallel Out - Parallel In- Serial Out - Parallel In -Parallel Out. **Counters:** Asynchronous Counters - Decoding Gates - Synchronous Counter - Changing the Counter Modulus - Decade counters. **(18 Hours)**

BOOK FOR STUDY

1. **"Digital Principles and Applications",** Donald P.Leach, Albert Paul Malvino, Gautam saha, McGraw Hill Education, Eighth Edition, Special Indian Edition, Sixth Reprint 2016.

   UNIT I: Chapters 2.1 - 2.4, 3.1 - 3.8

   UNIT II: Chapters 4.1 - 4.9

   UNIT III: Chapters 5.1, 5.3, 5.5 - 5.10, 6.1 - 6.8

   UNIT IV: Chapters 7.3 - 7.5, 8.1 - 8.6

   UNIT V: Chapters 9.1 - 9.5, 10.1 - 10.5

BOOKS FOR REFERENCE

1. **"Digital Logic and computer design",** M. Morris Mano, Pearson India Education Services Pvt. Ltd, 2016.
2. **"Practical Physics and Electronics",** C. C. Ouseph, U. J. Rao, V. Vijayendran, S. Viswanathan, Reprint 2014.

PROGRAMMING IN C ++ - LAB

Semester: I **Hours: 6**

Code : 24PGDCAP1 **Credit: 3**

1. Program to display the addition, subtraction, multiplication and division of two Simple programs in C++
2. Simple program with classes and objects.
3. Program using friend functions to calculate the total salary of the family.
4. Demonstration of Operator overloading & Function Overloading.
5. Program using constructor, constructor overloading and destructor.
6. Apply real time problems using different types of inheritance.
    a. Student Details - Single Inheritance
    b. Employee Details - Multiple Inheritance
    c. EB Bill Calculation - Multilevel Inheritance
    d. Railway Reservation Details - Hierarchical Inheritance
7. CIA Mark Preparation Program using Inheritance with virtual base class.
8. Program using Inheritance with virtual functions.
9. Accessing a particular record in a student's file.
10. Demonstration of Exception handling.

WEB DESIGNNG - LAB

Semester: I **Hours: 6**

Code : 24PGDCAP2 **Credit: 3**

Write Shell Programs for

1. Working with Internet (Id Creation, Searching)
2. Simple Web Page for Text Formatting
3. Working with colors
4. Web Page with Hyper Links
5. Web Page with Image
6. Web Page with Lists
7. Web Page with Table
8. Web Page with Frames
9. Application Form - Resume Preparation using images
10. Website Creation with necessary validation using scripting language
11. Website for College and Department

PROGRAMMING IN JAVA

Semester: II **Hours: 6**

Code : 24PGDCA04 **Credit: 4**

UNIT I

Overview of Java Language: Simple Java Program - More of Java - An Application with Two Classes - Java Program Structure - Java Tokens - Java Statements - Implementing a Java Program - Java Virtual Machine - Command Line Arguments - Programming Style. **Constants, Variables and Data Types:** Constants - Variables - Data Types - Declaration of Variables - Giving Values to Variables - Scope of Variables - Symbolic Constants - Type Casting - Getting Values of Variables - Standard Default Values. **(18 Hours)**

UNIT II

Operators and Expressions: Arithmetic Operators - Relational Operators - Logical Operators - Assignment Operators - Increment and Decrement Operators - Conditional Operator - Bitwise Operators - Special Operators - Arithmetic Expressions - Evaluation of Expressions - Precedence of Arithmetic Operators - Type Conversions in Expressions - Operator Precedence and Associativity - Mathematical Functions. **Decision Making and Branching:** 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. **(18 Hours)**

UNIT III

Decision Making and Looping: While Statement - Do Statement - For Statement - Jumps in Loops - Labeled Loops. **Classes, Objects and Methods:** Defining a Class - Fields Declaration - Methods Declaration - Creating Objects - Accessing Class Members - Constructors - Methods Overloading - Static Members - Nesting of Methods - **Inheritance:** Extending a class - Overriding Methods - Final Variables and Methods - Final Classes - Finalizer Methods - Abstract Methods and Classes - Methods with Varargs -Visibility Control. **(18 Hours)**

UNIT IV

Arrays, Strings and Vectors: One dimensional Arrays - Creating an Array - Two-dimensional Arrays - Strings - Vectors - Wrapper Classes - Enumerated Types - Annotations. **Interfaces: Multiple Inheritance:** Defining Interfaces - Extending Interfaces - Implementing Interfaces - Accessing Interface Variables. **(18 Hours)**

UNIT V

Multithreaded Programming: Creating Threads - Extending the Thread Class - Stopping and Blocking a Thread - Life Cycle of a Thread - Using Thread Methods - Thread Exceptions - Thread Priority - Synchronization - Implementing the_Runnable Interface - Inter-Thread Communication. **Managing Errors and Exceptions:** Types of Errors - Exceptions - Syntax of Exception Handling Code - Multiple Catch Statements - Using Finally Statement - Throwing Our Own Exceptions - Improved Exception Handling in Java SE 7 - Using Exceptions for Debugging. **(18 Hours)**

BOOK FOR STUDY

1. **"Programming with JAVA A Primer",** E. Balagurusamy, Tata McGrawHill Education (India) Private Limited, New Delhi, Fifth Edition, 2016.

   UNIT I: Chapters 3,4

   UNIT II: Chapters 5,6

   UNIT III: Chapters 7-9

   UNIT IV: Chapters 10,11

   UNIT V: Chapters 12-13

BOOKS FOR REFERENCE

1. **"The Complete reference Java 2"** Herbert Schildt, McGraw Hill Education (India) Private Ltd, Fifth Edition, 2015.
2. **"Core Java - An Integrated Approach",** Dr. R. Nageswara Rao, Dream Tech Press, 2017.

MULTIMEDIA

Semester: II **Hours: 6**

Code : 24PGDCA05 **Credit: 4**

UNIT I

What Is Multimedia: Definitions - Where to Use Multimedia - Delivering Multimedia. **Text:** The Power of Meaning - About Fonts and Faces - Using Text in Multimedia - Computers and Text - Font Editing and Design Tools - Hypermedia and Hypertext **(18 Hours)**

UNIT II

Images: Before You Start to Create - Making Still Images - Color. **Sound:** The Power of Sound - Digital Audio - MIDI Audio - MIDI vs. Digital Audio - Multimedia System Sounds - Audio File Formats - Vaughan's Law of Multimedia Minimums - Adding Sound to Your Multimedia Project. **(18 Hours)**

UNIT III

Animation: The Power of Motion - Principles of Animation - Animation by Computer - Making Animations That Work. **Video:** Using Video - How Video Works and Is Displayed - Digital Video Containers - Obtaining Video Clips - Shooting and Editing Video. **(18 Hours)**

UNIT IV

Making Multimedia: The Stages of a Multimedia Project - What You Need: The Intangibles - What You Need: Hardware - What You Need: Software - What You Need: Software - What You Need: Authoring Systems. **Multimedia Skills:** The Team. **(18 Hours)**

UNIT V

Planning and Costing: The Process of Making Multimedia - Scheduling - Estimating - RFPs and Bid Proposals - **Designing and Producing :** Designing - Producing. **Content and Talent:** Acquiring Content - Ownership of Content Created for a Project - Acquiring Talent. **(18 Hours)**

BOOK FOR STUDY

"Multimedia: Making it work", Tay Vaughan, Tata Mcgrw - Hill Edition, Eighth Edition, 2011.

UNIT I **:** Chapters : 1,2.
UNIT II **:** Chapters : 3,4.
UNIT III **:** Chapter : 5,6.
UNIT IV **:** Chapters : 7,8.
UNIT V **:** Chapters : 9,10.

BOOKS FOR REFERENCE

1. **"Fundamentals of Multimedia",** Ze-Nian Li and Mark S. Drew., 2004.
2. **"MULTIMEDIA SYSTEMS", Rajneesh Agrawal**, EXCEL BOOKS PRIVATE LIMITED, New Delhi, 2013.

COMMERCE

Semester: II **Hours: 6**

Code : 24PGDCA06 **Credit: 4**

UNIT I

History of **E-commerce and Ind**ian Business **Context**: Electronic Commerce-E-Commerce vs E-Business-Early Business Information Interchange Efforts-Emergence of the Internet-Emergence of the World Wide Web-The Milestones-Advantages of E-commerce-Disadvantages of E-commerce-Online Extension of a BAM Model-Transition to E-commerce in India-E-commerce Opportunities for Industries. **(18 Hours)**

UNIT II

Enabling Technologies **of the** World Wide Web **:** World Wide Web-Internet Client-Server Applications-Networks and Internets-Internet Service Provider (ISP)- Markup Languages and the Web-JavaScript-XML-Intranets and Extranets. **(18 Hours)**

UNIT III

e-Marketing: Traditional Marketing-Identifying Web Presence Goals-Online Marketing-E-advertising-Internet Marketing Trends-Target Markets-Marketing Strategies e-Security: Information System Security-Security on the Internet-E-business Risk Management Issues-Information Security Environment in Indi. **(18 Hours)**

UNIT IV

e-Payment Systems: American Express Credit Card Authorization-E-banking at ICICI Bank-Main Concerns in Internet Banking-History's Lesson about Payments: People Drive Change-Digital Payment Requirements-Electronic Cash (e-Cash). **(18 Hours)**

UNIT V

e-Customer Relationship Management: FedEx- Customer Relationship Management- Typical Business Touch-points- Orbitz- -Strategy and Knowledge Management: Knowledge Management at Tata Steel -Knowledge as a Key Business Asset- Changes in the Global Business Economy-Changes in Technology- Definitions of Knowledge. **(18 Hours)**

BOOK FOR STUDY

1. **“E-Commerce An Indian perspective”,** P.T. Josephs, S.J . PHI Learning Private Limited, Fourth Edition, 2013.

UNIT I	**:** Chapter	: 1
UNIT II	**:** Chapter	: 3
UNIT III	**:** Chapters	: 4, 5
UNIT IV	**:** Chapter	: 6
UNIT V	**:** Chapter	: **7**

BOOKS FOR REFERENCE

1. **"The Everything Store: Jeff Bezos and the Age of Amazon"**, Brad Stone, Little, Brown and Company,2013
2. **"E-commerce 2019: Business, Technology, Society"**, Kenneth C. Laudon and Carol Guercio Traver, Pearson , 2018.

JAVA PROGRAMMING - LAB

Semester: II **Hours: 6**

Code: 24PGDCAP3 **Credit: 3**

1. Simple class

a. Number Checking (Prime, Perfect, Palindrome, Armstrong, Adam)

b. Number Generation (Prime, Perfect, Palindrome, Fibonacci)

2. Arrays and control structures

a. Number Sorting and Searching

b. Matrix Manipulation (Addition, Subtraction, Multiplication and Transpose)

3. Constructors and Method overloading

a. Electricity Bill preparation

b. Complex Number operation

4. String Methods

a. String Sorting and Searching

b. Program using string methods

5. Inheritance

a. Staff information System

6. Exception Handling and Threads

a. Programs using built in and user defined Exceptions

MILLTIMEDIA - LAB

Semester: II **Hours: 6**

Code: 24PGDCAP4 **Credit: 3**

1. Drawing images using tools
2. Frame-by-Frame Animation
3. Motion Tweening
4. Classic Tweening
5. Shape Tweening
6. Shape Tweening with shape hints
7. Multilayer Animation
8. Animation using Layer Mask
9. Animation using Guide Layer
10. Text Animation
11. Animation using buttons and sound effects.
12. Short Story Creation

DIPLOMA IN COMPUTER APPLICATION - COURSE PATTERN

(Affiliated to Mother Teresa University, Kodaikanal)

DCA COURSE PATTERN

Sem.	Code	Title of the Paper	Hours	Credits
I	24DCSCA01	Computer Fundamentals	4	4
	24DCSCA02	.NET Programming	4	4
	24DCSCA03	Web Designing	4	4
	24DCSCAP1	.NET Programming - Lab	4	2
	24DCSCAP2	Web Designing - Lab	4	2
			20	**16**

COMPUTER FUNDAMENTALS

Semester: I **Hours: 4**

Code : 24DCSCA01 **Credit: 4**

UNIT I

Introduction to Computers: Definition - Characteristics of Computers - Stored Program concept - History of Computers - Classification of Computers - Application of Computers - Basic Organization of a Computer -**Input / Output Devices:** Input Devices - Output Devices - Soft copy Devices - Hard Copy devices - Voice Response Systems (VRS) - Biometric Devices **(12 Hours)**

UNIT II

Computer Memory and Processors: Introduction - Memory Organization - Memory Hierarchy - Sequential and Random Access - Processor Registers - Cache Memory - Primary Memory - Secondary Storage Devices - Magnetic Tapes - Floppy Disks - Hard Disks - External Hard Disks - Optical Disks - USB Flash Drives - Memory Cards - Mass Storage Devices - Basic Processor Architecture - Pipelining and Parallel Processing - Types of Processors - **Computer Software** - Introduction to Computer Software - Classification of Computer Software - Firmware - Middleware - Acquiring Computer Software - Open Source vs. Proprietary Software. **(12 Hours)**

UNIT III

Problem Solving Using Computers: Introduction - Design and Implementation of Efficient Programs - Program Design Tools - Programming Languages - Generations of Programming Languages - Programming Paradigms - Some Popular High-Level Languages - Factors Affecting Selection of Programming Languages - **Operating Systems** - Introduction - Evolution of Operating Systems - Process Management - Memory Management - File Management - Device Management - Security Management - Command Interpretation - Popular Operating Systems **(12 Hours)**

UNIT IV

Data Organization and Database Management System - Introduction - Data Organization - File Organization - File-Oriented Approach - Database Approach - File-Oriented vs. Database-Oriented Approach - Concept of Database Management System - Components of Database Management System - Database Views - Three-Schema Architecture - Database Models - Key Terms - Retrieving Data Through Queries - Data Warehousing - Data Mining. **(12 Hours)**

UNIT V

Internet and its application: Introduction - Internet Protocols - Internet Protocol Address - Domain Name System - Uniform/Universal Resource Locator - Connecting to the Internet - Internet Browsers - Internet Services - Hacking and Ethical Hacking - Data Security - Threats to Data Security - Preventive Measures.

(12 Hours)

BOOK FOR STUDY

1. **"Fundamentals of Computers"** Reema Thareja, Second Edition, Oxford University Press, 2019.

   UNIT I: Chapters 1, 2

   UNIT II: Chapters 3, 6

   UNIT III: Chapters 7, 8

   UNIT IV: Chapters 9

   UNIT V: Chapters 11

BOOKS FOR REFERENCE

1. **"Computer Fundamentals and Office Automation",** Dr. R. Deepalakshmi, Charulatha Publications, 2019.
2. **"Computer Basics with Office Automation",** Archana Kumar, dreamtech Press, Wiley Edition, 2019.
3. **"Fundamentals of Computers"** - Rajaraman, Sixth Edition, Prentice-Hall of India Private Limited, 2015

.NET PROGRAMMING

Semester: I **Hours: 4**

Code : 24DCSCA02 **Credit: 4**

UNIT I

Essential Visual Basic.Net: Putting visual basic to work-What's new in vb.net? - Upgrading from visual basic 6.0-building VB.NET Applications-**The Visual Basic Language:** The visual basic key words-visual basic statements- checking data types-declaring arrays and dynamic arrays-Handling Strings-Making decision with if else statements-using select case-using do loop- using for loop- using while loop. **(12 Hours)**

UNIT II

Windows Forms: Creating Windows Applications-Adding Controls to Forms-Handling Events. **Windows Forms:** The Control Class-Text Boxes-Rich Text Boxes-Labels-Link Labels - **Windows Forms:** Buttons-Checkboxes-Radio Buttons-Panels-Group Boxes - **Windows Forms:** List Boxes-Checked List Boxes -Combo Boxes-Picture Boxes - **Windows Forms:** Menus-Menu Items-Context Menus-The Built-in Dialog Boxes-Open File Dialogs-Save File Dialogs-Font Dialogs-Colour Dialogs- Printing Documents-Print Dialogs-Print Preview Dialogs-Custom Print Previews-Page Setup Dialogs. **(12 Hours)**

UNIT III

Windows Forms: Image Lists-Tree Views-List Views-Toolbars-Status Bars-Progress Bars-Tab Controls -**Object-Oriented programming:** classes and Object-Fields, Properties, Methods and Events-Class vs. Object Members-Abstraction and Encapsulation, Inheritance and polymorphism-Constructors and destructors-An oops Example-Structures and Modules - **Object-Oriented Inheritance:** Access Modifiers-Inheritance Modifiers-Overloading, Overriding, and Shadowing-Creating Interfaces-Polymorphism-Early and Late Binding. **Graphics and File Handling**: Graphics Handling-File Handling. **(12 Hours)**

UNIT IV

.Net Assemblies: .NET Assemblies-Shared Assemblies-Benefits of Assemblies over predecessors-Private Assemblies-Strong Names and Assembly Integrity-Cross-Section of Assembly-Assembly Information-Configuration Files. **Web Forms:** Working with Web Forms-Working with Web Form Controls-Saving a Web Application's State-Web Forms and HTML-Creating a Web Application-Running a Web Application. **Images:** Image Controls-Image Buttons-List Boxes-Drop-down Lists-Hyperlinks-Link Buttons. **(12 Hours)**

UNIT V

Validation Controls: Validation Controls-Required Field Validators-Comparison Validators-Range Validators-Regular Expression-Custom Validators-Validation Summaries-Calendars Ad Rotators.**HTML Controls:** Client and Server HTML Controls HTML Server Control Classes-The HTML Control Class-Working with HTML Client Controls-Working with HTML Server Controls **Data Access with ADO.NET:** What Are Databases? -Accessing Data with the Server Explorer-Accessing Data with Data Adaptors and Datasets-Working with ADO.NET-Overview of ADO.NET Objects. **Binding Controls to Databases:** Simple Binding-Complex Binding-Binding Data to Controls-Navigating in Datasets-Using the Display Member and Value Member Properties-Creating Data Forms with the Data Form Wizard-Using SQL Parameters. **(12 Hours)**

BOOK FOR STUDY

1. **"Visual Basic .Net Programming Black Book"** - Comprehensive Problem Solver, Steven Holzner, Publications, 2013.
   UNIT I : Chapters: 1(Pg. No 2-48), 2(Pg. No 72-74,83-85,87-88,90).
   UNIT II :Chapters: 4 (Pg. No 147-149) 5 (Pg. No 191-199),6 (Pg. No 229-231),7(Pg. No 263-267),9(Pg. No 345-353).
   UNIT III : Chapters: 10 (Pg. No 391-397),11(Pg. No 439-446),13(Pg. No 510-515)
   UNIT IV :Chapters: 14(Pg. No 550-566),15(Pg. No590-611),18(Pg. No 712-719)
   UNIT V :Chapters: 19(Pg. No742-748), 20(Pg. No 782-792),21(Pg. No 822-839), 22(Pg. No 865-891)

BOOKS FOR REFERENCE

1. **"Visual Basic .Net"**, C. Muthu, Tata McGraw- Hill Publishing Limited, New Delhi, Third Edition, 2002.
2. **"The Complete Reference HTML & XHTML",** Thomas A. Powell**,** Tata McGraw-Hill Publishing Company Limited, New Delhi, Edition, 4th Edition, 2004.

WEBDESIGNING

Semester: I **Hours: 4**

Code : 24DCSCA03 **Credit: 4**

UNIT I

Fundamentals: A Brief Introduction to the Internet -The World Wide Web - Web Browsers - Web Servers - Uniform Resource Locators - Multipurpose Internet Mail Extensions - The Hypertext Transfer Protocol - Security - The Web Programmer's Toolbox **(12 Hours)**

UNIT II

Introduction to HTML/XHTML: Origins and Evolution of HTML and XHTML - Basic Syntax - Standard HTML Document Structure - Basic Text Markup - Images - Hypertext Links - lists - Tables - Forms - The Audio Element - The Video Element - Organization Elements - The Time Element - Syntactic Differences between HTML and XHTML **(12 Hours)**

UNIT III

Cascading Style Sheets: Introduction - Levels of Style Sheets - Style Specification Formats -Selector Forms - Property-Value Forms - Font Properties - List Properties - Alignment of Text - Color - The Box Model - Background Images - The span and div Tags - Conflict Resolution **(12 Hours**)

UNITIV

The Basics of JavaScript: Overview of JavaScript - Object Orientation and JavaScript - General Syntactic Characteristics - Primitives, Operations, and Expressions - Screen Output and Keyboard Input - Control Statements - Object Creation and Modification - Arrays - Functions - An Example - Constructors - Pattern Matching Using Regular Expressions - Another Example - Errors in Scripts **(12 Hours**)

UNITV

JavaScript and HTML Documents: The JavaScript Execution Environment - The Document Object Model - Element Access in JavaScript - Events and Event Handling - Events and Event Handling - Handling Events from Body Elements - Handling Events from Button Elements - Handling Events from Text Box and Password Elements - The DOM 2 Event Model - The canvas Element - The navigator Object - DOM Tree Traversal and Modification. **(12 Hours)**

BOOK FOR STUDY

1. **"Programming the World wide Web"** ,Robertw. Sebesta,Pearson Education, Eighth Edition, 2020

   UNIT I : Chapter 1

   UNIT II: Chapter 2

   UNIT III : Chapter 3

   UNIT IV : Chapter 4

   UNIT V : Chapter 5

BOOKS FOR REFERENCE

1. **"Web Technologies HTML, JavaScript, PHP, Java, JSP XML and AJAX",** Black Book, Kogent Learning Solutions Inc.,Dreamtech Press,2017.
2. **"Internet & WorldWide Web How To Program"**, P.J.Dietal, H.M.Deital, Fourth Edition, Pearson InternationalEdition,2013.
3. **"Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI",** Ivan Bayross, BPB Publications, New Delhi, 3rd Edition,2009.

.NET PROGRAMMING - LAB

Semester: I **Hours: 4**

Code : 24DCSCAP1 **Credit: 2**

1. Program to display the addition, subtraction, multiplication and division of two number using console application.
2. Write a program to convert input string from lower to upper and upper to lower case.
3. Picture Animation Using Timer Control.
4. Menu operations using Common Dialog Control.
5. Write a program to simple calculator using windows application.
6. View Image Using Necessary Control.
7. Program to display the first 10 natural numbers and their sum using console application.
8. To Create the custom dialog box and MDI concepts.
9. Write a program working with forms using ASP.NET.
10. Write a program to access data source through ADO.NET.

WEB DESIGNING - LAB

Semester: I **Hours: 4**

Code : 24DCSCAP2 **Credit: 2**

1. Working with Internet(ID Creation, Searching).
2. Simple web page for text formatting.
3. Web page with Hyper Links.
4. Web page with Lists.
5. Web page with Table.
6. Working with Colors.
7. Web page with Image.
8. Working with Forms.
9. Application Form-Resume Preparation Using Images.
10. Website Creation Using Scripting Language.
11. Website for college and Department using CSS.

DIPLOMA IN DESK TOP PUBLISHING COURSE PATTERN

(Affiliated to Mother Teresa University, Kodaikanal)

S. No	Code	Title of the Paper	Hours	Credits
1.	24DCSDT01	TEXT DSIGNING FUNDAMENTALS	4	4
2.	24DCSDT02	PHOTO DESIGNING	4	4
3.	24DCSDT03	GRAPHIC DESIGNING	4	4
4.	24DCSDTP1	TEXT DSIGNING - LAB	4	2
5	24DCSDTP2	PHOTO AND GRAPHICS DESIGNING - LAB	4	2
			20	**14**
Total 15 weeks x 20 = 300 hours				

TEXT DSIGNING FUNDAMENTALS

Semester: I **Hours: 4**
Code : 24DCSDT01 **Credit: 4**

UNIT I

Introduction to InDesign CC: Introducing New and Enhanced Features of Adobe InDesign CC - Minimum Hardware and Software Requirements for InDesign CC 2018 - Lounching the InDesign CC 2018 Application - Creating a New Document in InDesign CC 2018 - Exploring the User Interface of InDesign CC 2018 - Working with Workspace - Creating a Master Page - Saving a Document - Working with ruler Guides - Closing the Document and Quitting the InDesign CC 2018 Application - **Working with Document** - Working with the Text Frames - Using Type on a Path Tool - Finding and Replacing Text - Working with Layers - Introducing Interactive PDF Forms - Generating a QR Code - Generating Table of Contents - Creating Bookmarks for PDF - Creating Hyperlink in a Document - Adding Editorial Notes in a Document. **(12 Hours)**

UNIT II

Formatting the Document - Applying the Basic Formatting Tasks - Working with Typekit Fonts - Adding Border to a Paragraph - Working with Styles - Importing Styles from Other Documents - **Working with Tables:** Creating Tables - Adding Text to a Table - Working with Rows and Columns - Inserting a Header in a Table- Formatting Cells and Text in a Table - Table Strokes and Fills. **(12 Hours)**

UNIT III

Working with Drawing Tools: Drawing with Shape Tools - Drawing with Pencil Tool - Drawing with Pen Tool - **Working with Objects:** Importing an Object - Transforming an Object - Working with Corner Options - Arranging the Objects - Aligning Objects with a Key Object - Working with Pathfinder - Linking and Embedding Objects - Inserting Video and Audio in a Document . **(12 Hours)**

UNIT IV

Using Graphics: Explaining Different Types of Graphics - Importing Graphics - Adjusting Image in a Frame - Using Content Collector Tool -Using the Object Styles for Graphics - **Applying Effects and Animations:** Using Effects on an Object - Animating an Object - Working with Transitions. **(12 Hours)**

UNIT V

Working with Colours and Strokes: Defining the Types of Colours - Working with Colours and Strokes - Working with Strokes - Using Swatches Panel - **Publishing the Document:** Performing the Preflight Check in the Document - Saving a Document as a PDF File - Previewing and Exporting in Grayscale - Exporting a Document in the JPEG Format - Exporting a Document in HTML - Publishing a Document Online - Printing a Document - Using Print Presets.

(12 Hours)

BOOK FOR STUDY

"Adobe InDesign Help InDesign CC in Simple steps", DT Editorial Services

DreamTech Press, 2019.

UNIT I	**:**	Chapters	**:**	1,2
UNIT II	**:**	Chapters	**:**	3,4
UNIT III	**:**	Chapters	**:**	5,6
UNIT IV	**:**	Chapters	**:**	7,8
Unit V	**:**	Chapters	**:**	9,10

BOOKS FOR REFERENCE

1. **"Comdex 9-in-1 DTP Course Kit", Vikas Gupta**, Dreamtech Press Edition, 2013.
2. **"Adobe InDesign CC Classroom in a Book", Kelly Kordes Anton, Tina Dejarld,** 2018.

PHOTO DESIGNING

Semester: I **Hours: 4**

Code : 24DCSDT02 **Credit: 4**

UNIT I

Getting into Photoshop: Introduction - Best in Photoshop 7.0 - Photoshop Interface-Saving the File-Importing Existing File. **(12 Hours)**

UNIT II

Editing and Retouching: Working with Selections-Getting started with the Selection tool-Selection with Rectangle Marquee Tool-Selection with Elliptical Marquee Tool-Moving a Selection-Moving with Keyboard Shortcut-Selection with the Magic Wand-Selection with Lasso Tool-Adding and Subtraction Selection-Selection with the Magnetic Lasso-Transforming a Selection-Combining Selection Tools-Cropping the Completed Image-Quick Mask tool to make Selection-Enabling the Quick Mask Mode-Adjusting Quick Mask Setting-Patch Tool-Paint Tools-Image Color Adjustments. **(12 Hours)**

UNIT III

Making Artistic use of Photoshop: Painting Tools-Working with Brushes-Drawing-Eraser Tool-Brushes Palette-Pen Tool-Selecting an Image with Pen Tool-Editing and Cleaning Tools-Clone Stamp Tool-Healing Brush-Image Resizing.

(12 Hours)

UNIT IV

Building Original Art work: Layers-Creating A Layer -Layer Mask-Transform-Custom shapes -Create Your own Custom shapes. **(12 Hours)**

UNIT V

Transforming Images with Filters: Filters-Text Tool-Text Wrap-Try it.

(12 Hours)

BOOK FOR STUDY

Adobe Photoshop 7.0 - A Novice Guide" J. Jenitha, A. Diana, ACCA Publication, 2012.

UNIT I	**:**	Chapter	**:**	1
UNIT II	**:**	Chapter	**:**	2
UNIT III	**:**	Chapter	**:**	3
UNIT IV	**:**	Chapter	**:**	4
UNIT V	**:**	Chapters	**:**	5, 6

BOOKS FOR REFERENCE

1. **"Photoshop CS6 in Simple Steps",** Kogent Learning Solutions Inc, Dreamtech Press, 2013.
2. **"Adobe InDesign CC Classroom in a Book",** Kelly Kordes Anton, Tina Dejarld**,** 2018.

GRAPHICS DESIGNING

Semester: I **Hours: 4**

Code : 24DCSDT03 **Credit: 4**

UNIT I

CorelDraw Basics: Characteristic Features - Getting Started with CorelDraw- Creating a new file - The CorelDraw Screen - Property bar - Working with files - Views - Zooming. **(12 Hours)**

UNIT II

Drawing and Selecting: Getting familiar with the toolbox - Getting started with the Project - Working with Objects and Shapes - Applying effects to Objects. **(12 Hours)**

UNIT III

Working with Text: The text tool - Align Artistic & Paragraph Text - Converting from one text type to another - Formatting text - Set Line & Character Spacing - Edit Individual Characters - Check Spelling - Customizing Type Assist - Aligning and distributing objects - Changing the order of objects - The Text Editor - Fitting text to a path - Wrapping & Combining and linking paragraph text frames - Creating, applying, and editing graphic or text styles - Create Columns - Link Text Area **(12 Hours)**

UNIT IV

Working with Images: Bitmaps and vector images - Importing images - Resizing, Rotating and Skewing images - Cropping an image - Adding special effects to bitmaps - Exporting files to other applications - Publishing to PDF. **(12 Hours)**

UNIT V

Page Layout and Background: Changing the page size - Changing the page layout - Changing the page background - Page Frame - Guidelines - Rulers - Create a Grid - Working with Pages - Working with Layers. **(12 Hours)**

BOOK FOR STUDY

1. **"Get your feet Wet with CorelDRAW"**, Sr R. Joshitta, Ms. S. Josephine, ACCA Publications, 2012.

BOOKS FOR REFERENCE

1. **"Comdex Multimedia and Web Design",** Vikas Gupta, Dreamtech Press Edition, 2010.
2. **"Comdex 14-in-1 Computer Course Kit",** Vikas Gupta, Dreamtech Press Edition, 2008.

PHOTO AND GRAPHICS DESIGNING - LAB

Semester: I **Hours: 4**

Code : 24DCSDTP1 **Credit: 2**

PHOTOSHOP

1. Exercises using Painting and Brushes
2. Exercises using Cloning and Healing
3. Working with Layers
4. Exercises using Shapes and Styles
5. Working with Text Effects and Colors.

CorelDRAW

1. Working with artistic text
2. Working with Symbols and drawing shapes.
3. Working with Images and background colors adding special effects to Images
4. Text placing in line Path
5. Design an Invitation using images, shapes and text.

TEXT DESIGNING - LAB

Semester: I **Hours: 4**

Code : 24DCSDTP2 **Credit: 2**

ADOBE INDESIGN

1. Formatting and adding Text Effect in Page
2. Working with Shape tools
3. Working with Images
4. Transforming objects.
5. Adding Graphics to the Picture palate
6. Create, fill, and manipulate text and image frames
7. Opacity advanced, water marks and Transparency Effects
8. Poster Making
9. Book Cover Page Designing
10. Brochure Designing
11. Preparation of a Visiting Card
12. News Letter Preparation

SKILL DEVELOPMENT PROGRAMME (SDP)

OPEN SOURCE WEB DEVELOPMENT WITH LAMP

(Affiliated to Mother Teresa University, Kodaikanal)

COURSE PATTERN

Theory: 30 Hours **Practical: 30 Hours** **Total: 60 hours**

Code	Title of the Paper	Hours	Credit
24CS1SD02	Open Source Web Development With Lamp	2	2
24CS1SDP2	Open Source Web Development With Lamp - Lab	2	1
Total (15 weeks x 4 = 60 hours)		**4**	**3**

OPEN SOURCE WEB DEVELOPMENT WITH LAMP

Code: 24CS1SD02 **Hours: 2** **Credit: 2**

UNIT I

Open Source: Overview of open source software, Open source products, Development philosophy, Comparison between Open source, closed source, free software, and source-available, Pros and cons, Development tools. **(6 Hours)**

UNIT II

Linux Administration: Configuring the bash shell, Finding and processing files, Managing users, groups and permissions, Investigating and managing processes, Essential system administration tools. **Setting Environment:** Installing and configuring apache web server (Linux), Installing PHP (Linux),Introduction to PHP and MySQL, Identifying the prerequisites, Unpacking, configuring and compiling, Editing httpd.conf, Setting up access privileges, Restartingapache server.

(6 Hours)

UNIT III

Database Management Using MySQL: Getting started with MySQL, Installing MySQL on linux configuring your system, Creating databases, tables, and indexes, Inserting, deleting, and updating data, Querying MySQL, Working with advanced queries, Understanding the different join types using MySQL, Built-in functions with SELECT. **(6 Hours)**

UNIT IV

PHP: Getting started with PHP, Working with variables in PHP, Working with constants in PHP, Working with simple expressions and operators in PHP, Using control and looping statements, Working with advance program flow statement , Working with functions, Working with arrays, Storing data in arrays using PHP, Manipulating arrays. **(6 Hours)**

UNIT V

Processing Web Forms in PHP: Working with forms in PHP, Validating input data, Using magic quotes, File and directory access in PHP, PHP file handling, PHP directory handling, Working and formatting with strings, Investigating and manipulating strings, Saving form data: Saving form data using cookies, Saving form data using sessions. **Handling Databases:** Working with the DBA functions, Database integration-SQL. **(6 Hours)**

BOOK FOR STUDY

Study Material-By the Department

BOOKS FOR REFERENCE

1. **"Professional LAMP Linux, Apache, MySql and PHP5 Web development"**, Jason Gerner, Elizabeth Naramore, Morgan L. Owens, Matt Warden, Wiley Publications, 2006.
2. **"Beginning PHP 5.3"**,Matt Doyle, Wiley Publications, 2010.

OPEN SOURCE WEB DEVELOPMENT WITH LAMP - LAB

Code: 24CS1SDP2 **Hours: 2** **Credit: 1**

1. Installation and setting up of LAMP environment

LINUX

2. Basic Commands in Linux
3. Shell programming with control structures

PHP & MySQL

4. Develop a PHP program using controls and functions
5. Develop a PHP program using String function and Arrays.
6. Develop a PHP program using parsing functions (use Tokenizing)
7. Develop a PHP program and check Regular Expression, HTML functions, Hashing functions.
8. Develop a PHP program and check File System functions, Date and time functions.
9. Creating a form for various operation SQL queries using PHP
10. Develop a PHP program to display student information using MYSQL table.
11. Develop a college application form using MYSQL.

COMPUTER MAINTENANCE HARDWARE AND NETWORKING

(Affiliated to Mother Teresa University, Kodaikanal)

COURSE PATTERN

Theory: 30 Hours **Practical: 30 Hours** **Total: 60 hours**

Code	Title of the Paper	Hours	Credit
24CS1SD01	Computer Maintenance Hardware and Networking	2	2
24CS1SDP1	Computer Maintenance Hardware and Networking - Lab	2	1
Total (15 weeks x 4 = 60 hours)		**4**	**3**

COMPUTER MAINTENANCE HARDWARE AND NETWORKING

Code : 24CS1SD01 **Hours: 2** **Credit: 2**

UNIT I

Computers: Desktop Computer - Tablet - Laptop - Mainframe Computers - Super Computers - Features of Characteristics Computer - Components of Computer - Components of Desktop Systems - Components of Laptop - Components of Tablet - Types of Servers - Server Applications. **(6 Hours)**

UNIT II

Motherboard: Introduction - Motherboard: Components, Layout, Connections - Motherboards: Types and Features - Enhancing Features of Motherboard: Adding and or replacing components - Troubleshooting Problems of a Motherboard.

Processor and BIOS: Processor - Multiple Core Processors - Co-processors - BIOS **(6 Hours)**

UNIT III

Hard Disk Drive: Introduction - Hard Disk Drive (HDD) - Hard Disk Interfaces - HDD Interfaces - EIDE - Serial ATA - SCSI Interface - USB - Firewire (IEEE 1394) - RAID- Solid-State Drive (SSD) - Disk Structure: HDD Disk Structure - Disk Performance Parameters Characteristics: Seeks and Latency, Data Transfer Rate - File System - FAT - NTFS - Unix File System - Hard Drives Partitioning **(6 Hours)**

UNIT IV

I/O and Modem: Troubleshoot I/O Devices - Switches - Keyboard - Mouse - Scanner - Webcam - Monitors - Printers - Speaker and Mike Problems - LCD Projector - I/O Cables - Video Graphics Adapter (VGA) or Super-VGA (SVGA) - Digital Visual Interface (DVI) - Audio I/O Port - Ethernet RJ45 (Registered Jack) Port - HDMI - PS/2 Port - Modem - Network Interface - Anti-Virus (AV). **6 Hours)**

UNIT V

Power Supply: Introduction - Switch Mode Power Supply (SMPS) - Purpose and Features of SMPS - Working of SMPS - Fault Finding in Power Supply - Uninterrupted Power Supply (UPS) - Types of UPS, Online and Offline - Preventive Maintenance of Power Supply. **(6 Hours)**

BOOK FOR STUDY

1. **"Computer Peripheral and Hardware Maintenance",** Dr. K. S. Wagh, Tech Knowledge Publications, Fifth Revised Edition, 2023.

   UNIT I : Chapter 1.1 - 1.3.2

   UNIT II : Chapters 2.1 - 2.5.5, 3.1 - 3.4.6

   UNIT III : Chapter 4.1 - 4.7

   UNIT IV : Chapter 5.1 - 5.4

   UNIT V : Chapter 6.1 - 6.5

BOOKS FOR REFERENCE

1. **"The Complete Reference PC Hardware",** Craig Zacker, John Rourke, McGraw Hill Education, 2017.
2. **"Modern Computer Hardware Course",** ManaharLotia, Pradeep Nair, PayalLotia, BPB Publications, 2017.

COMPUTER MAINTENANCE HARDWARE AND NETWORKING- LAB

Code : 24CS1SDP1 Hours: 2 Credit: 1

1. Identification of Computer Parts and Connectors
2. Specifications of Desktop PC, Laptop and Server
3. Identify and Troubleshoot Motherboards
4. Configure BIOS Settings
5. Partition and Manage Hard Disk: Format Hard Drives with different File Systems.
6. Installation of Operating System (Windows Family, Linux Family)
7. Troubleshooting Hard Disk
8. Install Local Printer and Share Printer in Network
9. Set Keyboard, Mouse, Monitor, Speaker, Microphone and LCD Projector.
10. Assemble and Disassemble Desktop System
11. Use Diagnostic Software for Fault Finding Viruses

ONLINE SKILL DEVELOPMENT COURSES - Via JACTILE

(Affiliated to Mother Teresa Women's University, Kodaikanal)

Basic Courses: (8 weeks - 1 Credit)

1. Python Fundamentals - 24CS1SD03
2. R for Beginners - 24CS1SD04
3. Laravel for Beginners - 24CS1SD05
4. Crash Course on ReactJS - 24CS1SD06

Advanced Courses: (16 Weeks - 2 Credit)

5. Advanced Programming in Python - 24CS2SD01
6. Advanced Analytics usingR - 24CS2SD02
7. Data Analytics with Python - 24CS2SD04
8. Full stack Web Development Bootcamp - 24CS2SD04

PYTHON FUNDAMENTALS

Code: 24CS1SD03 **Weeks: 8** **Hours: 5** **Credit: 1**

WEEK 1

Introduction to Python: Structure of a Python Program - Elements of Python- Python Interpreter - Using Python as calculator - Python shell - Indentation. Atoms - Identifiers and keywords - Literals - Strings and Operators. **(5 Hours)**

WEEK 2

Conditional Statements and Looping: Branching Looping, Conditional Statement, Exit function, Difference between break, continue and pass. **String Manipulation:** Understanding string, Accessing Strings, Basic Operations, String slices, Function and Methods. **(5 Hours)**

WEEK 3

List: Introduction to list, Accessing list, list operations, Working with lists, Function and Methods. **Tuples:** Introduction to tuple, Accessing tuples, Operations, Working, Functions and Methods. **(5 Hours)**

WEEK 4

Dictionary: Introduction to dictionaries, Accessing values in dictionaries, Working with dictionaries, Properties, Functions. **(5 Hours)**

WEEK 5

Python Functions: Defining a function, Calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables, Organizing python codes using functions. **(5 Hours)**

WEEK 6

Python Modules: Organizing python projects into modules, Importing own module as well as external modules, Understanding Packages, modules and external packages. **(5 Hours)**

WEEK 7

Input-Output: Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files, Functions. **(5 Hours)**

WEEK 8

Exception Handling: Introduction to Exception, Exception Handling, Except clause, Try? finally clause, User Defined Exceptions.**(5 Hours)**

BOOKS FOR REFERENCE

1. **"Introduction to Computing and Problem solving using Python",** E. Balagurusamy, McGraw Hill Education Private Ltd., I Edition, Reprint 2022
2. **"Problem Solving and Python Programming",** S.A. Kulkarni, Yes Dee Publishing Pvt. Ltd., Second Edition, 2018.
3. **"Python Programming using Problem Solving Approach",** Reema Thareja, Published by Oxford Higher Education, 2017.
4. **"Think Python, 2e: How to Think Like a Computer Scientist",** B. Downey, O'Reilly, 2015.
5. **"LEARN PYTHON 3 THE HARD WAY",** Z. Shaw,Addison-Wesley, 2017.
6. **"Problem Solving and Python Programming",** Arockia Mary P,Shanlax Publications, 2021.

WEB REFERENCES

1. https://onlinecourses.nptel.ac.in/noc23_cs99/preview
2. https://www.udemy.com/course/python-beginner-to-advanced-level-course/
3. https://www.coursera.org/specializations/python
4. https://www.coursera.org/learn/python-crash-course
5. https://www.udemy.com/course/python-coding/
6. https://www.coursera.org/learn/codio-advanced-django-advanced-drf

R FOR BEGINNERS

Code: 24CS1SD04 **Weeks: 8** **Hours: 5** **Credit: 1**

WEEK 1

Getting R: Downloading R- R Version-32-bit versus 64 -bit- Installing - Revolution - R Community Edition- **The R Environment:** Command Line Interface- RStudio - Revolution analytics RPE- R Packages: Installing Packages Loading Packages- Building a packages **(5 Hours)**

WEEK 2

Basics of R: Basic Math- Variables -data types - Vectors- Calling Functions- Function Documentation- Missing data. **Advanced Data Structures:** Dataframes- Lists- Matrices-Arrays. **(5 Hours)**

WEEK 3

Reading Data into R: Reading CSVs-Excel data-Reading from databases-Data from other Statistical Tools- R Binary Files- Data included with R- Extract Data from Web Sites. **(5 Hours)**

WEEK 4

Writing R Functions: Hello, world!- Function Arguments- Return Values - do..call- **Control Statements:** if and else- switch- ifelse - Compound Tests. **Loops, the Un -R Way to Iterate:** for loops - while loops- controlling loops.

(5 Hours)

WEEK 5

Manipulating Strings: paste - sprint - Extracting Text - Regular Expressions

(5 Hours)

WEEK 6

Data Visualization: Importance of Data Visualization - Data Visualization for Machine Learning - Data Visualization Techniques. **(5 Hours)**

WEEK 7

Data Visualization for Simple Data Visualization Using R: Generic Plot - Scatter Plot - Strip Chart - Stacked Bar Plot - Grouped Bar Plot - Pie Chart - Kernel Density Plot. **(5 Hours)**

WEEK 8

Data Visualization Using Ggplots in R: Scatter Plot - Line Plot - Boxplot - Violin Plot - Ridge Plot. **(5 Hours)**

BOOKS FOR REFERENCE

1. **"R for Everyone Advanced Analytics and Graphics",** Jared P. Lander, Pearson Education, 2015.
2. **"Data Analytics with R Programming",** V. Bhuvaneswari, Scitech Publications (India) Pvt Ltd, 2018
3. **"Data Analytics Using R",** Seema Acharya, McGraw Hill Education, First Edition 2018.
4. **"R Programming an Approach to Data Analytics",** G Sudhamathy, C Jothi Venkateswaran, MJP Publishers, 2021.

WEB REFERENCES

1. https://www.coursera.org/learn/data-analysis-r
2. https://www.coursera.org/specializations/statistics
3. https://www.coursera.org/specializations/data-science-foundations-r?
4. https://www.udemy.com/course/r-level1/
5. https://www.udemy.com/course/r-programming/

LARAVEL FOR BEGINNERS

Code: 24CS1SD05 **Weeks: 8** **Hours: 5** **Credit: 1**

WEEK 1

OVERVIEW OF Laravel: Introduction of Laravel - Features of Laravel - History of Laravel - Introduction of MVC Pattern - Laravel Directory Structure - **Installation:** XAMPP Installation - Composer Installation - Git Installation - Laravel Application Structure. **(5 Hours)**

WEEK 2

Laravel Routing: Laravel Basic Routing - Routing Parameters - Laravel Named Routes - Laravel Middleware - Laravel Route Groups - **Laravel Controllers:** Laravel Controllers - Routing Controllers - Resource Controllers - Controller Middleware - Laravel Views: Laravel Views -Passing data to views. **(5 Hours)**

WEEK 3

Laravel Blade Template: Display Images - Make Anchor - Displaying Variables - Conditional Statements - Loop in blade - PHP function - Build Your Master layout -Extending the master layout - nested views - Include Views - Adding assets. **(5 Hours)**

WEEK 4

Using Forms and Gathering Input: Adding HTML 5 Package - Creating A form using Blade Syntax - Validating user input - File Uploading - Error message Handling - Encrypting and decrypting data - Preserving the data **(5 Hours)**

WEEK 5

Laravel Migration: Laravel Migration - Migration Structure - Generating Migrations - Migration Commands **(5 Hours)**

WEEK 6

Security & Session: Removing Public from URL -Sessions Effective **(5 Hours)**

WEEK 7

Laravel Database - Introduction Model - Type of Database using - Eloquent ORM Model - Naming Convention - Table name - Primary key - Timestamps - Use model **(5 Hours)**

WEEK 8

Display data from models in views - Manage Mass Assignment - CRUDS Operation - Fluent - Simple Query String - CRUDS Operation - Query Builder - CRUDS Operation **(5 Hours)**

BOOKS FOR REFERENCE

1. **"Beginning Laravel: Build Websites with Laravel 5.8",** Sanjib Sinha, aPress, 2019
2. **"Laravel: Up & Running - A Framework for Building Modern PHP Apps"**, Matt Stauffer, O'Reilly Publication, Second Edition, 2019
3. **"Mastering Laravel",** A Scholtens, Sas155 Publisher 2023,

WEB REFERENCES

1. https://www.udemy.com/course/laravel-beginner-fundamentals
2. https://www.coursera.org/specializations/secure-coding-in-laravel
3. https://www.coursera.org/learn/secure-coding-in-laravel-course-1
4. https://www.udemy.com/course/laravel-blog-development/

CRASH COURSE ON REACTJS

Code: 24CS1SD06 **Weeks: 8** **Hours: 5** **Credit: 1**

WEEK 1

ReactJS - Introduction - ReactJS - Installation - ReactJS- Architecture **(5 Hours)**

WEEK 2

React - Creating a React Application - React - JSX **(5 Hours)**

WEEK 3

ReactJS - Component- React - Styling - React - Properties (props) - React **(5 Hours)**

WEEK 4

Event management - React - State Management - React - Http client programming **(5 Hours)**

WEEK 5

React - Form programming - React-Routing **(5 Hours)**

WEEK 6

React - Redux - React - Animation - React -Testing- React - CLI Commands - React - Building and Deployment **(5 Hours)**

WEEK 7

React -Example **(5 Hours)**

WEEK 8

Online Examination **(5 Hours)**

BOOKS FOR REFERENCE

1. **"React JS Made Easy: A Beginner's Guide To Easily Learn React JS",** Magige Robi, Programming Ebooks, Kindle Edition, 2021
2. **"React.js Design Patterns: Learn how to build scalable React apps with ease"**, Anthony Onyekachukwu Okonta, BPBPublication, 2023
3. **"React.Js Programming, In 8 Hours, For Beginners, Learn Coding Fast: React.Js Language, Crash Course Textbook & Exercises",**Ray Yao, Ada C. Perl, Kafka R. Swift,Quick Start GuideCode Book; FourthEdition,2022
4. **"React JS: From Basics to Advanced - A Comprehensive 3-in-1 Guide to Effortless Web Development for Beginners, Intermediates, and Experts"**, Vivian Walker, Kindle Edition, 2023
5. **"React.js For Beginners",** Mayur Patil, Notion Press, 2023

WEB REFERENCES

1. https://www.udemy.com/course/react-the-complete-guide-incl-redux/
2. https://www.udemy.com/course/the-ultimate-react-course/
3. https://www.udemy.com/course/react-tutorial-and-projects-course/
4. https://www.udemy.com/course/complete-react-developer-zero-to-mastery/

ADVANCED PROGRAMMING IN PYTHON

Code: 24CS2SD01 **Weeks: 16** **Hours: 5** **Credit: 2**

WEEK 1

Object Oriented Python - a recap: Assertion, Decorators, Generators and Iterators **(5 Hours)**

WEEK 2

Threading in Python: Creation, Execution of threads using threading module **(5 Hours)**

WEEK 3

Database programming using Python: Connecting to a database (sqlite) using Python - Sending DML and DDL queries and processing the result from a Python Program **(5 Hours)**

WEEK 4

Network programming using Python: An introduction to client-server programming - Basics of TCP and UDP protocols - Introduction to socket programming - Building an HTTP client and server **(5 Hours)**

WEEK 5

GUI in Python: Introduction to GUI building libraries - Widgets - Button - Canvas - Checkbutton - Entry - Frame - Label - Listbox - Menubutton - Menu - Message - Radiobutton - Scale - Scrollbar - Text - Toplevel - Spinbox - PanedWindow - LabelFrame-tkMessageBox **(5 Hours)**

WEEK 6

Basic image processing using Python: Introduction to digital image processing - Basic operations on an image - Crop - Scale - Rotate - Flip - Changing contrast, brightness and color - Edge detection, blur, sharpening **(5 Hours)**

WEEK 7

Basic numerical processing using Python: Introduction to numpy - Creation of vectors and matrices - Matrix manipulation **(5 Hours)**

WEEK 8

Basing data analysis using Python: Introduction to Pandas - Pandas data structures - Series and DataFrame **(5 Hours)**

WEEK 9

Data wrangling using pandas: Loading a dataset into a dataframe - Selecting Columns from a dataframe - Selecting Rows from a dataframe - Adding new data in a dataframe - Deleting data from a dataframe **(5 Hours)**

WEEK 10

Basic data visualization using Python: Introduction to Matplotlib -Scatter plot - Line plot - Bar chart - Histogram-Box plot **(5 Hours)**

WEEK 11

Regular expression: RE package **(5 Hours)**

WEEK 12

Web Scrapping: Beautiful Soup **(5 Hours)**

WEEK 13

Case Study - 1

WEEK 14

Case Study - 2

WEEK 15

Case Study - 3

CASE STUDIES: All these case studies are for practice purpose for students.

1. Write a python function which accepts a sentence and returns a list in which first value is the count of upper case letters and second value is the count of lower case letters in the sentence. Ignore spaces, numbers and other special characters if any.
2. WeCare insurance company wants to calculate premium of vehicles. Vehicles are of two types - "Two Wheeler" and "Four Wheeler". Each vehicle is identified by vehicle id, type, cost and premium amount. Premium amount is 2% of the vehicle cost for two wheelers and 6% of the vehicle cost for four wheelers. Calculate the premium amount and display the vehicle details
3. Retrieve and process some data and then use the Google Maps API to visualize our data

BOOKS FOR REFERENCE

1. **"Advanced Python Programming: Accelerate your Python programs using proven techniques and design patterns"** Quan Nguyen, Packt Publishing Limited, 2nd edition, 2022
2. **"Advanced Python Programming: Build high performance, concurrent, and multi-threaded apps with Python using proven design patterns",** Sakis Kasampalis, Quan Nguyen, Dr Gabriele Lanaro, Dr. Gabriele Lanaro, Ingram short title, 2019
3. **"Expert Python Programming: Master Python by learning the best coding practices and advanced programming concepts",** Michał Jaworski, Tarek Ziadé, Packt Publishing Limited, 4th Edition, 2021

4. **"Core Python Programming, 3ed: Covers fundamentals to advanced topics like OOPS, Exceptions, Data structures, Files, Threads, Net",** R. Nageswara Rao, Dreamtech Press, 2021
5. **"Think Python, 2e: How to Think Like a Computer Scientist",** B. Downey, O'Reilly, 2015.

WEB REFERENCES

1. https://www.udemy.com/course/100-days-of-code/
2. https://www.udemy.com/course/complete-python-developer-zero-to-mastery/
3. https://www.udemy.com/course/complete-python-programming-masterclass-beginner-to-advanced/
4. https://www.udemy.com/course/the-python-pro-course/
5. https://www.udemy.com/course/complete-python-bootcamp/

ADVANCED ANALYTICS USING R

Code: 24CS2SD02 **Weeks: 16** **Hours: 5** **Credit: 2**

WEEK 1

Introduction to R: R and RStudio Environment - RStudio Environment - Four Windows in RStudio. **(5 Hours)**

WEEK 2

Basics of R : Set Working Directory in R - Comment Statements in R - Variables in R - Data Types in R - Operators in R - Functions in R - Vectors in R - Lists in R - Data Frames in R - Packages in R. **(5 Hours)**

WEEK 3

Exploratory Data Analysis: Steps in Data Pre-processing - Understanding Data - Steps Involved in EDA Using R Programming - Looking at the Data. **(5 Hours)**

WEEK 4

Dealing with Missing Values: Replacing "na" Values of Continuous Variables with Mean Mean Imputation - Replacing the "na" Values of Continuous Variables with Mean: Median Imputation - Replacing the "na" Values of Categorical Variables with Mode: Mode Imputation. **(5 Hours)**

WEEK 5

Data Visualization: Importance of Data Visualization - Data Visualization for Machine Learning - Data Visualization Techniques**. Simple Data Visualization Using R:** Generic Plot - Scatter Plot - Strip Chart - Stacked Bar Plot - Grouped Bar Plot - Pie Chart - Kernel Density Plot. **(5 Hours)**

WEEK 6

Data Visualization Using Ggplots in R: Scatter Plot - Line Plot - Boxplot - Violin Plot - Ridge Plot. **Dimensionality Reduction Techniques:** Dimensionality Reduction - Independent and Dependent Variables. **Relationship between Variables:** Correlation: Application of Factor Analysis using R Programming - Multicollinearity. **(5 Hours)**

WEEK 7

Factor Analysis: Eigen Value - Scree Plot - Unrotated Factor Matrix - Rotated Factor Matrix. Unsupervised Learning Algorithms: Introduction **(5 Hours)**

WEEK 8

Association Rule Mining: Transaction Dataset - Support - Confidence - Lift - Apriori Algorithm - Association Rule - Plotting of Rules. **Conjoint An analysis:** Full and Fractional Factorial Design - Choice Cards - Attribute Importance. **(5 Hours)**

WEEK 9

Supervised Learning Algorithms: Decision Tree and Random Forest: Decision Tree - Tree Structure - Criteria for Splitting Decision Node. **(5 Hours)**

WEEK 10

Classification and Regression Technique: Control Parameters - Pruning the Tree - Model Performance Measures - Insights from Decision Rules. **(5 Hours)**

WEEK 11

Random Forest: Control Parameters - Out of Bag Error Rate - Tuning the Random Forest - Variable Importance Plot - Model Performance Measures. **Supervised Learning Algorithm:** K-Nearest Neighbors: Similarity Based on Distance Function - Select Appropriate K Value **(5 Hours)**

WEEK 12

KNN Model Building - Model Performance Measures. **Naive Bayes Algorithm:** Types of Naïve Bayes Theorem - Building Naïve Bayes Classifier - Model Performance Measures. **(5 Hours)**

WEEK 13

Case Study - 1

WEEK 14

Case Study - 2

WEEK 15

Case Study - 3

BOOKS FOR REFERENCE

1. **"Introduction to Data Science Practical Approach with R and Python",** B. Uma Maheshwari and R. Sujatha, Wiley India Pvt. Ltd., First Edition, 2021
2. **"Data Analytics With R Programming",** V. Bhuvaneswari, Scitech Publications (India) Pvt Ltd, 2018
3. **"Data Analytics Using R",** Seema Acharya, McGraw Hill Education, First Edition 2018.
4. **"R Programming an Approach to Data Analytics",** G Sudhamathy, C Jothi Venkateswaran, MJP Publishers, 2021.

WEB REFERENCES

1. https://www.coursera.org/learn/data-analysis-r
2. https://www.coursera.org/specializations/statistics
3. https://www.coursera.org/specializations/data-science-foundations-r?
4. https://www.udemy.com/course/r-level1/
5. https://www.udemy.com/course/r-programming/

DATA ANALYTICS WITH PYTHON

Code: 24CS2SD03 **Weeks: 16** **Hours: 5** **Credit: 2**

WEEK 1

Software Development, Data types and Expressions: Strings, Assignment, and Comments - Numeric Data types and Character sets - Expressions **(5 Hours)**

WEEK 2

Loops and Selection Statements: Definite iteration: the for Loop - selection: if and if-else statements - Conditional iteration: the while Loop - **Strings and Text Files:** Accessing Characters and substrings in strings - Data encryption - Strings and Number systems- String methods - Text files. **(5 Hours)**

WEEK 3

Lists and Dictionaries: Lists - Dictionaries - **Design with Functions:** A Quick review - Problem Solving with top-Down Design - Design with recursive Functions - Managing a Program's namespace - Higher-Order Functions. **(5 Hours)**

WEEK 4

Design with Classes: Getting inside Objects and Classes - Data-Modeling Examples - Building a New Data Structure: The Two - Dimensional Grid - Structuring Classes with Inheritance and Polymorphism. **(5 Hours)**

WEEK 5

Graphical User Interfaces - The Behavior of terminal-Based programs and GUI-Based programs - Coding Simple GUI-Based programs - Windows and Window Components - Command Buttons and responding to events. **(5 Hours)**

WEEK 6

The NumPy Library: Ndarray: The heart of the Library - Basic Operations - Indexing, Slicing and Iteration - Array manipulation. **The Pandas Library-An Introduction**: The Series - The DataFrame - The Index Objects. **(5 Hours)**

WEEK 7

Data Visualization with Matplotlib: The Matplotlib Architecture - pyplot - The Plotting Window - Adding Elements to the Chart - Line Charts - Bar Charts - Pie charts. **(5 Hours)**

WEEK 8

Introduction to Data Science: Functional Programming - JSON and XML in Python - NumPy with Python - Pandas - Visualization with Matplotlib: General Matplotlib Tips - Two Interfaces for the Price of One - Simple Line Plots - Visualizing Errors - Density and Contour Plots - Histograms, Binnings, and Density **(5 Hours)**

WEEK 9

Customizing Matplotlib: Configurations and Stylesheets - Three-Dimensional Plotting in Matplotlib - Geographic Data with Basemap - Visualization with Seaborn. **(5 Hours)**

WEEK 10

Descriptive Measures: Averages or Measures of Central Tendency - Arithmetic Mean - Median - Mode - Geometric Mean - Harmonic Mean - Selection of an Average - Partition Values - Dispersion - Measures of Dispersion - Coefficient of Dispersion - Moments - Skewness - Kurtosis. **(5 Hours)**

WEEK 11

Theory of Probability: Basic Terminology - Mathematical or Classical Probability - Statistical or Empirical Probability - Subjective Probability - Conditional Probability - Multiplication Theorem of Probability - Independent Events - Baye's Theorem. **(5 Hours)**

WEEK 12

Correlation: Meaning of Correlation - Scatter Diagram - Karl Pearson Coefficient of Correlation **(5 Hours)**

WEEK 13

Curve Fitting and Regression Analysis: Linear Regression - Curvilinear Regression - Regression Curves **(5 Hours)**

WEEK 14

Multiple and Partial Correlation and Regression Analysis: Multiple and Partial Correlation and Regression - Plane of Regression - Coefficient of Multiple Correlation - Coefficient of Partial Correlation. **(5 Hours)**

WEEK 15

Case Study - 1

WEEK 16

Case Study - 2

BOOKS FOR REFERENCE

1. **"Fundamentals of Python: first programs",** K.A. Lambert, Second Edition, Cengage Learning, 2018.
2. **"Python Data Analytics: With Pandas, NumPy, and Matplotlib",** Fabio Nelli Second Edition, Kindle Edition, 2018.

WEB REFERENCES

1. https://onlinecourses.nptel.ac.in/noc24_cs20/preview
2. https://www.udemy.com/course/data-analytics-python/
3. https://www.udemy.com/course/data-analysis-with-pandas/
4. https://www.coursera.org/learn/python-data-science

FULL STACK WEB DEVELOPMENT BOOTCAMP

Code: 24CS2SD04 **Weeks: 16** **Hours: 5** **Credit: 2**

WEEK 1

Web Basics - HTML, CSS, JS, Debugging, DOM, Git/hub, Terminal **(5 Hours)**

WEEK 2

Web Basics Drill Down - Scope, JS this, jQuery, CSS Responsive & Modern Design, Grid, MVC, Modules. **(5 Hours)**

WEEK 3

AJAX - Templates, & OOP - JSON, Handlebars, HTTP, APIs. **(5 Hours)**

WEEK 4

OOP Basics, Inheritance & Polymorphism, UMLs **(5 Hours)**

WEEK 5

Servers - Node, NPM, Express, CRUD, Middleware, Promises **(5 Hours)**

WEEK 6

Databases - FullStack Mongo, Mongoose, Population, Event Loop, JS async/await, Git Branching, Collaboration, Heroku. **(5 Hours)**

WEEK 7

Data Structures & Algorithms -Time Complexity (Big O), Recursion, Sets, Stacks, Queues, Matrices, Trees. **(5 Hours)**

WEEK 8

React -Virtual DOM, JSX, Components, State, Props, Events, Routing, Lifecycle **(5 Hours)**

WEEK 9

MobX - Stores, Observables, Actions, Computed Values, Provider, Injection. **(5 Hours)**

WEEK 10

SQL -Basic Commands, Relationships Joins, Sequelize. **(5 Hours)**

WEEK 11

Miscellaneous -Testing, CSS Material, CSS LESS, Enrichment Content. **(5 Hours)**

WEEK 12

Project -Hands-on work beyond exercises including minigames. **(5 Hours)**

WEEK 13

Project -Weather App. **(5 Hours)**

WEEK 14

Project - CRM system, and more.

WEEK 15

Hackathons - Mid-Hackathon, Final Project

BOOKS FOR REFERENCE

1. **"Full Stack Web Development for Beginners: Learn Ecommerce Web Development Using HTML5, CSS3, Bootstrap, JavaScript, MySQL, and PHP",** Riaz Ahmed, Independently Publisher, 2021
2. **"Full Stack Web Development: The Comprehensive Guide",** Philip Ackermann, Shroff/Rheinwerk Computing Publisher, First Edition, 2023
3. **"Full Stack Web Development: Everything Beginners to Expert Guide on Modern Full-Stack Web Development Using Modern Web Development Tools",** Sammie Smith, Kindle Edition, 2022

WEB REFERENCES

1. https://www.udemy.com/course/the-complete-web-development-bootcamp/
2. https://www.udemy.com/course/fullstack-web-development-course-projects-base/
3. https://www.udemy.com/course/the-ultimate-fullstack-web-development-bootcamp/
4. https://www.udemy.com/course/complete-web-development-course/