# GOVERNMENT ARTS AND SCIENCE COLLEGE FOR WOMEN, BARGUR DEPARTMENT OF COMPUTER SCIENCE

#### 2021-2022

## **Program Outcome**

After completion of the programme, the graduates will be able

PO1: To understand the fundamental concepts of computer system, including hardware and software.

PO2: To Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.

PO3: To apply the appropriate technologies, skills and tools in various fields of Computer Science.

PO4: To analyze impacts of computing on individuals, organization and society.

## **Programme Specific Outcomes(PSOs)**

After completion of the programme, the graduates will be able to

**PSO1**: Apply domain knowledge and problem solving skills to solve real time problems.

**PSO2**: Acquire good employability skills which will ensure exceptional career opportunities in IT companies.

**PSO3**: Get a strong foundation to purse higher education in the field of Computer Science/Applications.

## **B.Sc – COMPUTER SCIECNE**

#### **SEMESTER I**

## CORE I: PROBLEM SOLVING THROUGH C

## **OUTCOME**

- 1. It aims to provide exposure to problem-solving through programming
- 2. To apprehend the basic concepts of C- Programming language. This course introduces fundamental concepts such as arrays and structures.
- 3. It covers concepts such as arrays, pointers and file handling methods.
- 4. It provides technical skills to design and develop various applications.

## **ALLIED I**

## **ALLIED: ALGEBRA AND CALCULUS**

#### **OUTCOME**

- 1. To learn the basic concepts and problem solving in Theory of equations. Develop the ability of solving the Integrals.
- 2. To learn the basic concepts and problem solving in Theory of equations. Develop the ability of solving the Integrals.

## **SEMESTER II**

## **CORE II: DATA STRUCTURE AND ALGORITHMS**

## **OUTCOME**

- 1. Understand the basic concept of algorithms
- 2. To introduce the various data structures and their implementations.
- 3. Evaluate the performance of various sorting algorithms.

## CORE III: COMPUTER ORGANIZATION AND ARCHITECTURE

## **OUTCOME**

- 1.To know Structure and functions of Computer architecture and organizations.
- 2. Observe the characteristics of various computer memory concepts.
- 3. To understand the computer arithmetic and machine instructions.
- 4. Understand the parallel processing concepts.

## **ALLIED II**

## ALLIED-DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS

## **OUTCOME**

- 1.Develop the basic concepts of Maxima and Minima of two variables and Numerical methods problems.
- 2.To learn the second order differential equation with constant coefficients.
- 3. To learn the basic concepts of Laplace Transforms, Inverse Laplace Transforms & Applications.

## **SEMESTER III**

## CORE IV: RELATIONAL DATABASE MANAGEMENT SYSTEMS

## **OUTCOME**

- 1. Understand the basic concept of Data Base and database management system.
- 2. Understand and apply the SQL fundamentals.
- 3. Evaluate the Relational database design.

## **CORE V: COMPUTER NETWORKS**

#### **OUTCOME**

- 1. To understand the concept of Computer network.
- 2. To impart knowledge about networking and internet devices.

## **ALLIED III**

## ALLIED PHYSICS - I

- 1. To inculcate the concepts of various properties of matter.
- 2.To impart the knowledge on the basic principle of mechanics, Heatwaves, Electricity and Magnetism

#### **SEMESTER IV**

## **CORE VI: PROGRAMMING IN JAVA**

## **OUTCOME**

- 1. To understand the concepts of Object Oriented Programming.
- 2. To learn about the control structures, class with attributes and methods used in Java.

## **ALLIED IV**

## **ALLIED PHYSICS – II**

- 1.To impart knowledge on the basic concepts of Atomic, Nuclear and Solid State Physics, Electronics and Digital Electronics.
- 2.To acquire knowledge on their applications.

## **SEMESTER V**

#### **CORE VII: OPERATING SYSTEMS**

#### **OUTCOME**

- 1. To understand the fundamental concepts and role of Operating System.
- 2. To learn the Process Management and Scheduling Algorithms
- 3. To understand the Memory Management policies
- 4. To gain insight on I/O and File management techniques

## **CORE VIII: WEB TECHNOLOGY**

#### **OUTCOME**

- 1. To understand the fundamental concepts and role of Web Technology.
- 2. To learn the Process of CSS.
- 3. To understand the web pages.
- 4. To gain insight on script objects.

## **CORE IX: LINUX AND SHELL PROGRAMMING**

## **OUTCOME**

- 1. To understand the Linux OS.
- 2. Study the shell programming and text formatting.

## **SEMSTER VI**

## **CORE X: PROGRAMMING IN PYTHON**

## **OUTCOME**

- 1. To understand the basic components of computer programming using the Python language.
- 2. To demonstrate significant experience with the Python program development environment.

# GOVERNMENT ARTS AND SCIENCE COLLEGE FOR WOMEN, BARGUR DEPARTMENT OF COMPUTER SCIENCE

#### 2021-2022

## **Program Outcome**

To Develop the Post Graduate in Computer Science with strong knowledge of theoretical computer science and who can be employed in research and development units of industries and academic institutions.

## M.Sc -COMPUTER SCIECNE

#### **SEMESTER I**

## **CORE I: DESIGN AND ANALYSIS OF ALGORITHMS**

#### **OUTCOME**

- 1.It gives stepwise procedure to solve problems.
- 2. The Problems can be broken down into small pieces for program development
- 3. Efficient approach of solving problems by a model of computations

## **CORE II: DISTRIBUTED OPERATING SYSTEMS**

#### **OUTCOME**

- 1.Clear understanding on several resource management techniques like distributed shared memory and other resources
- 2. Knowledge on mutual exclusion and Deadlock detection of Distributed operating system.
- 3. Able to design and implement algorithms of distributed shared memory and commit protocols
- 4. Able to design and implement fault tolerant distributed systems.

## CORE III: ADVANCED JAVA PROGRAMMING

## **OUTCOME**

- 1. Able to develop a Graphical User Interface (GUI) with Applet and Swing
- 2. Develop a Client-Server Application with Database Maintenance

## **CORE IV: INTERNET OF THINGS**

#### **OUTCOME**

1.Gain the basic knowledge about IoT and they will be able to use IoT related products in real life

2.It helps to rely less on physical resources and started to do their work smarter

**SEMESTER II** 

CORE VII: ADVANCED WEB TECHNOLOGY

**OUTCOME** 

1.Design a web page with Web form fundamentals and web control classes

2. Recognize the importance of validation control, cookies and session

3. Apply the knowledge of ASP.NET object, ADO.NET data access and SQL to develop a client

server model

4. Recognize the difference between Data list and Data grid controls in accessing data

**CORE VIII: COMPILER DESIGN** 

**OUTCOME** 

• On the successful completion of this course, Students will be able to: Use the knowledge

of patterns, tokens & regular expressions for solving a problem.

**CORE IX: DATA MINING** 

**OUTCOME** 

• After completing this course, students will be familiar with basic data mining concepts

for solving real world problems

**SEMESTER III** 

CORE XII: OPEN SOURCE COMPUTING

**OUTCOME** 

• After completing this course, students will be familiar with the basics of Python programming

for writing programs for the real world problems

CORE XIII: DIGITAL IMAGE PROCESSING

OUTCOME

At the end of this course, students should able to

1. Review the fundamental concepts of a digital image processing system and Analyze images in

the frequency domain using various transforms.

2. Evaluate the techniques for image enhancement and image restoration. Categorize various

compression techniques.

3. Interpret Image compression standards, and Interpret image segmentation and representation

techniques.

4. Gain idea to process various image used in various fields such as weather forecasting,

Diagnosis of various disease using image such as tumor, cancer etc.

**CORE XIV: BIG DATA ANALYTICS** 

**OUTCOME** 

On successful completion of the course the student should

1. Able to apply Hadoop ecosystem components.

2. Able to participate data science and big data analytics projects.

**SEMESTER IV** 

**CORE XVII: MACHINE LEARNING** 

**OUTCOME** 

On completion of the course students will be expected to:

1. Have a good understanding of the fundamental issues and challenges of machine learning:

data, model selection, model complexity, etc.

2. Have an understanding of the strengths and weaknesses of many popular machine learning

approaches.

3. Appreciate the underlying mathematical relationships within and across Machine Learning

algorithms and the paradigms of supervised and unsupervised learning.

4.Be able to design and implement various machine learning algorithms in a range of real-world

applications.

# GOVERNMENT ARTS AND SCIENCE COLLEGE FOR WOMEN, BARGUR DEPARTMENT OF COMPUTER SCIENCE

#### 2023 - 2024

## **B.Sc Computer Science**

## 1. Programme Outcome, Programme Specific Outcome and Course Outcome

Computer Science is the study of quantity, structure, space and change, focusing on problem solving, application development with wider scope of application in science, engineering, technology, social sciences etc. The key core areas of study in Mathematics include Algebra, Analysis (Real & Complex), Differential Equations, Geometry, and Mechanics. The Students completing this programme will be able to present Software application clearly and precisely, make abstract ideas precise by formulating them in the Computer languages. Completion of this programme will also enable the learners to join teaching profession, enhance their employability for government jobs, jobs in software industry, banking, insurance and investment sectors, data analyst jobs and jobs in various other public and private enterprises.

## 2. Programme Outcomes (PO) of B.Sc. degree programme in Computer Science

- ➤ Scientific aptitude will be developed in Students
- ➤ Students will acquire basic Practical skills & Technical knowledge along with domain knowledge of different subjects in the Computer Science & humanities stream.
- > Students will become employable; Students will be eligible for career opportunities in education field, Industry, or will be able to opt for entrepreneurship.
- > Students will possess basic subject knowledge required for higher studies, professional and applied courses.
- > Students will be aware of and able to develop solution oriented approach towards various Social and Environmental issues.
- ➤ Ability to acquire in-depth knowledge of several branches of Computer Science

and aligned areas. This Programme helps learners in building a solid foundation for higher studies in Computer Science and applications.

- ➤ The skills and knowledge gained leads to proficiency in analytical reasoning, which can be utilized in modelling and solving real life problems.
- ➤ Utilize computer programming skills to solve theoretical and applied problems by critical understanding, analysis and synthesis.
- > To recognize patterns and to identify essential and relevant aspects of problems.
- ➤ Ability to share ideas and insights while seeking and benefitting from knowledge and insight of others.
- ➤ Mould the students into responsible citizens in a rapidly changing interdependent society.

The above expectations generally can be pooled into 6 broad categories and can be modified according to institutional requirements:

PO1: Knowledge

PO2: Problem Analysis

PO3: Design / Development of Solutions

PO4: Conduct investigations of complex problems

PO5: Modern tool usage

PO6: Applying to society

## **SEMESTER I**

#### **CC 1: PYTHON PROGRAMMING**

#### **Course Outcomes**

- 1. Learn the basics of python, Do simple programs on python, Learn how to use an array.
- 2. Develop program using selection statement, Work with Looping and jump statements, Do programs on Loops and jump statements
- 3. Concept of function, function arguments, implementing the concept strings in various application, Significance of Modules, Work with functions, Strings and modules.
- 4. Work with List, tuples and dictionary, Write program using list, tuples and dictionary.

5. Usage of File handlings in python, Concept of reading and writing files, Do programs using files.

## FOUNDATION COURSE FC: PROBLEM SOLVING TECHNIQUES

## **Course Outcomes**

- 1. Study the basic knowledge of Computers. Analyze the programming languages.
- 2. Study the data types and arithmetic operations. Know about algorithms. Develop program using flow chart and pseudocode.
- 3. Determine the various operators. Explain about the structures. Illustrate the concept of Loops
- 4. Study about Numeric data and character-based data. Analyze about Arrays.
- 5. Explain about DFD.Illustrate program modules. Creating and reading files.

#### CC 2: PRACTICAL PYTHON PROGRAMMING

## **Course Outcomes**

- 1. Demonstrate the understanding of syntax and semantics of PYTHON
- 2. Identify the problem and solve using PYTHON programming techniques.
- 3. Identify suitable programming constructs for problem solving
- 4. Analyze various concepts of PYTHON language to solve the problem in an efficient way
- 5. Develop a PYTHON program for a given problem and test for its correctness

#### CC 3: DATA STRUCTURE AND ALGORITHMS

#### **Course Outcomes**

- Understand the concept of Dynamic memory management, data types, algorithms, Big O notation
- 2. Understand basic data structures such as arrays, linked lists, stacks and queues
- 3. Describe the hash function and concepts of collision and its resolution methods
- 4. Solve problem involving graphs, trees and heaps
- 5. Apply algorithm for solving problems like sorting, searching, insertion and deletion of data

## CC 4: PRACTICAL -DATA STRUCTURE AND ALGORITHMS LAB

#### **Course Outcomes**

- 1. Understand the concept of Dynamic memory management, data types, algorithms, Big O notation
- 2. Understand basic data structures such as arrays, linked lists, stacks and queues
- 3. Describe the hash function and concepts of collision and its resolution methods
- 4. Solve problem involving graphs, trees and heaps
- 5. Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data

## SKILL ENHANCEMENT COURSE -SEC3: INTRODUCTION TO HTML

## **Course Outcomes**

- 1. Knows the basic concept in HTML. Concept of resources in HTML.
- 2. Knows Design concept. Concept of Meta Data. Understand the concept of save the files.
- 3. Understand the page formatting. Concept of list
- 4. Creating links. Know the concept of creating a link to email address.
- 5. Concept of adding images. Understand the table creation.

## SEMESTER III

## CC 5: MICROPROCESSOR AND MICRO CONTROLLER

#### **Course Outcomes**

- Remember the Basic binary codes and their conversions. Binary concepts are used in Microprocessor programming and provide a good understanding of the architecture of 80850 introduce the internal organization of Intel 8085 Microprocessor
- 2. Understanding the 8085 instruction set and their classifications, enables the students to write the programs easily on their own using different logic
- Applying different types of instructions to convert binary codes and analyzing the outcome. The instruction set is applied to develop programs on multibyte arithmetic operations.
- Analyze how peripheral devices are connected to 8085 using Interrupts and DMA controller.
- 5. An exposure to create real time applications using microcontroller

#### CC 6: PRACTICAL MICROPROCESSOR AND MICRO CONTROLLER LAB

#### **Course Outcomes**

- Remember the Basic binary codes and their conversions. Binary concepts are used in Microprocessor programming and provide a good understanding of the architecture of 8085 introduce the internal organization of Intel 8085 Microprocessor
- 2. Understanding the 8085 instruction set and their classifications, enables the students to write the programs easily on their own using different logic
- 3. Applying different types of instructions to convert binary codes and analyzing the outcome. The instruction set is applied to develop programs on multibyte arithmetic operations.
- 4. Analyze how peripheral devices are connected to 8085 using
- 5. Interrupts and DMA controller.
- 6. An exposure to create real time applications using microcontroller

## **SEMESTER IV**

## **CC 7: JAVA PROGRAMMING**

## **Course Outcomes**

- 1. Understand the basic Object-oriented concepts.
- 2. Implement the basic constructs of Core Java.
- 3. Implement inheritance, packages ,interfaces and exception handling of core java
- 4. Implement multi-threading and I/O Streams of Core Java
- 5. Implement AWT and Event handling.
- 6. Use Swing to create GUI.

## **CC 8: JAVA PROGRAMMING LAB**

## **Course Outcomes**

- Understand the basic Object-oriented concepts. Implement the basic constructs of Core Java.
- 2. Implement inheritance, packages, interfaces and exception handling of Core Java.
- 3. Implement multi-threading and I/O Streams of Core Java
- 4. Implement AWT and Event handling.
- 5. Use Swing to create GUI.

## **SEMESTER V**

#### **CC 9: SOFTWARE ENGINEERING**

#### **Course Outcomes**

- 1. Gain basic knowledge of analysis and design of systems
- 2. Ability to apply software engineering principles and techniques
- 3. Model a reliable and cost-effective software system
- 4. Ability to design an effective model of the system
- 5. Perform Testing at various levels and produce an efficient system.

#### CC 10: DATABASE MANAGEMENT SYSTEM

## **Course Outcomes**

- 1. Understand the various basic concepts of Data Base System. Difference between file system and DBMS and compare various data models
- Define the integrity constraints. Understand the basic concepts of Relational Data Model, Entity-Relationship Model.
- Design database schema considering normalization and relationships within database. Understand and construct database using Structured Query Language. Attain a good practical skill of managing and retrieving of data using Data Manipulation Language (DML)
- 4. Classify the different functions and various join operations and enhance the knowledge of handling multiple tables.
- Learn to design Data base operations and implement using PL/SQL programs.
   Learn basics of PL/SQL and develop programs using Cursors, Exceptions

## CC 11: DATABASE MANAGEMENT SYSTEM LAB

## **Course Outcomes**

- 1. Understand the various basic concepts of Data Base System. Difference between file system and DBMS and compare various data models.
- 2. Define the integrity constraints. Understand the basic concepts of Relational Data Model, Entity-Relationship Model.

- Design database schema considering normalization and relationships within database.
   Understand and construct database using Structured Query Language. Attain a good practical skill of managing and retrieving of data using Data Manipulation Language (DML)
- 4. Classify the different functions and various join operations and enhance the knowledge of handling multiple tables.
- 5. Learn to design Data base operations and implement using PL/SQL programs.

  Learn basics of PL/SQL and develop programs using Cursors, Exceptions

## **SEMESTER VI**

#### **CC 13: COMPUTER NETWORKS**

#### **Course Outcomes**

- 1. To understand the basics of Computer Network architecture, OSI and TCP/IP reference models
- 2. To gain knowledge on Telephone systems using wireless network
- 3. To understand the concept of MAC
- 4. To analyze the characteristics of Routing and Congestion control algorithms
- 5. To understand network security and define various protocols such as FTP, HTTP, Telnet, DNS

## **CC 13: .Net PROGRAMMING**

## **Course Outcomes**

- Develop working knowledge of C# programming constructs and the NET Framework
- 2. To develop a software to solve real-world problems using ASP.NET
- 3.To Work On Various Controls Files
- 4. To create a web application using Microsoft ADO.NET.
- 5. To develop web applications using XML

## **CC 13: .Net PROGRAMMING LAB**

## **Course Outcomes**

- 1.To create web applications and implement various controls
- 2.Create web pages in Rich control
- 3.Develop knowledge about file handling operations
- 4.An ability to design XML classes
- 5.To develop a software to solve real-world problems using ASP.NET

## GOVERNMENT ARTS AND SCIENCE COLLEGE FOR WOMEN, BARGUR

## DEPARTMENT OF COMPUTER SCIENCE

## 2023 - 2024

## M.Sc -COMPUTER SCIECNE

## **Program Outcome**

To Develop the Post Graduate in Computer Science with strong knowledge of theoretical computer science and who can be employed in research and development units of industries and academic institutions.

## **SEMESTER I**

## **CORE I: ANALYSIS & DESIGN OF ALGORITHMS**

## **COURSE OUTCOMES**

- 1. Get knowledge about algorithms and determines their time complexity. Demonstrate specific search and sort algorithms using divide and conquer technique.
- 2. Gain good understanding of Greedy method and its algorithm.
- 3. Able to describe about graphs using dynamic programming technique.
- 4. Demonstrate the concept of backtracking & branch and bound technique.
- 5. Explore the traversal and searching technique and apply it for trees and graphs.

## CORE II: OBJECT ORIENTED ANALYSIS AND DESIGN & C++

- 1. Understand the concept of Object-Oriented development and modeling Techniques.
- 2 Gain knowledge about the various steps performed during object design.
- 3 Abstract object-based views for generic software systems
- 4. Link OOAD with C++ language.
- 5. Apply the basic concept of OOPs and familiarize to write C++ program.

## CORE III: PYTHON PROGRAMMING

## **COURSE OUTCOMES**

- 1. Understand the basic concepts of Python Programming
- 2. Understand File operations, Classes and Objects
- 3. Acquire Object Oriented Skills in Python
- 4. Develop web applications using Python
- 5. Develop Client Server Networking applications

#### ELECTIVE -COURSE I: ADVANCED SOFTWARE ENGINEERING

#### **COURSE OUTCOMES**

- 1. Understand about Software Engineering process
- 2. Understand about Software project management skills, design and quality management
- 3. Analyze on Software Requirements and Specification
- 4. Analyze on Software Testing, Maintenance and Software Re-Engineering
- 5. Design and conduct various types and levels of software quality for a software project

## ELECTIVE -COURSE I: MULTIMEDIA AND ITS APPLICATIONS

- 1. Understand the basic concepts of Multimedia
- 2. Demonstrate Multimedia authoring tools
- 3. Analyze the concepts of Sound, Images, Video & Animation
- 4. Apply and Analyze the role of Multimedia in Internet and real time applications
- 5 Analyze multimedia applications using HDTV

#### **ELECTIVE -COURSE I: EMBEDDED SYSTEMS**

## **COURSE OUTCOMES**

- 1. Understand the concept of 8051 microcontroller
- 2. Understand the Instruction Set and Programming
- 3. Analyze the concepts of RTOS
- 4. Analyze and design various real time embedded systems using RTOS
- 5. Debug the malfunctioning system using various debugging techniques

## ELECTIVE -PRACTICAL I: ALGORITHM AND OOPS LAB

#### **COURSE OUTCOMES**

- **1.** Understand the concepts of object oriented with respect to C++.
- 2. Able to understand and implement OOPS concepts.
- 3. Implementation of data structures like Stack, Queue, Tree, List using C++.
- 4. Application of the data structures for Sorting, Searching using different techniques.

## CORE -PRACTICAL II: PYTHON PROGRAMMING LAB

## **COURSE OUTCOMES**

- 1. Able to write programs in Python using OOPS concepts.
- 2. To understand the concepts of File operations and Modules in Python.
- 3. Implementation of lists, dictionaries, sets and tuples as programs.
- 4 .To develop web applications using Python.

## **SEMESTER II**

CORE IV: DATA MINING AND WAREHOUSING

- 1. Understand the basic data mining techniques and algorithms.
- 2. Understand the Association rules, Clustering techniques and Data warehousing contents.
- 3. Compare and evaluate different data mining techniques like classification, prediction, Clustering and association rule mining.
- 4. Design data warehouse with dimensional modeling and apply OLAP operations.
- 5. Identify appropriate data mining algorithms to solve real world problems

## **CORE V: ADVANCED OPERATING SYSTEMS**

## **COITSE OUTCOMES**

- 1. Understand the design issues associated with operating systems
- 2. Master various process management concepts including scheduling, deadlocks and distributed file systems
- 3. Prepare Real Time Task Scheduling
- 4. Analyze Operating Systems for Handheld Systems
- 5. Analyze Operating Systems like LINUX and iOS

## CORE VI: ADVANCED JAVA PROGRAMMING

- 1. Understand the advanced concepts of Java Programming.
- 2 Understand JDBC and RMI concepts.
- 3. Apply and analyze Java in Database.
- 4. Handle different event in java using the delegation event model, event listener and class.
- 5. Design interactive applications using Java Servlet, JSP and JDBC

## ELECTIVE -COURSE II: ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

## **COURSE OUTCOMES**

- 1. Demonstrate AI problems and techniques
- 2. Understand machine learning concepts
- 3. Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning
- 4. Analyze the impact of machine learning on applications
- 5. Analyze and design a real world problem for implementation and understand the dynamic behavior of a system

## **ELECTIVE - COURSE II: INTERNET OF THINGS**

## **COURSE OUTCOMES**

- 1. Understand about IoT, its Architecture and its Applications
- 2. Understand basic electronics used in IoT & its role
- 3 .Develop applications with C using Arduino IDE
- 4 .Analyze about sensors and actuators
- 5. Design IoT in real time applications using toady's internet & wireless technologies

## ELECTIVE -COURSE II: MOBILE COMPUTING

- 1. Understand the need and requirements of mobile communication
- 2. Focus on mobile computing applications and techniques
- 3. Demonstrate satellite communication in mobile computing
- 4. Analyze about wireless local loop architecture
- 5. Analyze various mobile communication technologies

## ELECTIVE -COURSE II: BLOCK CHAIN TECHNOLOGY

## **COURSE OUTCOMES**

- 1. Demonstrate blockchain technology and crypto currency
- 2. Understand the mining mechanism in blockchain
- 3. Apply and identify security measures, and various types of services that allow people to trade and transact with bitcoins
- 4. Apply and analyze Blockchain in health care industry
- 5. Analyze security, privacy, and efficiency of a given Blockchain system

#### **CORE -PRACTICAL III : DATA MINING USING R**

## **COURSE OUTCOMES**

- 1. Able to write programs using R for Association rules, Clustering techniques
- 2. To implement data mining techniques like classification, prediction
- 3. Able to use different visualizations techniques using R
- 4. To apply different data mining algorithms to solve real world applications

## CORE -PRACTICAL IV: ADVANCED JAVA LAB

- 1. Understand to the implement concepts of Java using HTML forms, JSP & JAR.
- 2. Must be capable of implementing JDBC and RMI concepts.
- 3 Able to write Applets with Event handling mechanism.
- 4. To Create interactive web based applications using servlets and jsp.

## **SEMESTER III**

#### **CORE VII: DIGITAL IMAGE PROCESSING**

## **COURSE OUTCOMES**

- 1. Understand the fundamentals of Digital Image Processing.
- 2. Understand the mathematical foundations for digital image representation, image acquisition, image transformation, and image enhancement.
- 3. Apply, Design and Implement and get solutions for digital image processing problems.
- 4. Apply the concepts of filtering and segmentation for digital image retrieval.
- 5 .Explore the concepts of Multi-resolution process and recognize the objects in an efficient manner.

## **CORE VIII: CLOUD COMPUTING**

## **COURSE OUTCOMES**

- 1. Understand the concepts of Cloud and its services.
- 2. Collaborate Cloud for Event & Project Management.
- 3. Analyze on cloud in Word Processing, Spread Sheets, Mail, Calendar, Database.
- 4. Analyze cloud in social networks
- 5. Explore cloud storage and sharing.

#### CORE IX: NETWORK SECURITY AND CRYPTOGRAPHY

- 1. Understand the process of the cryptographic algorithms
- 2. Compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication
- 3. Apply and analyze appropriate security techniques to solve network security problem
- 4. Explore suitable cryptographic algorithms

5. Analyze different digital signature algorithms to achieve authentication and design secure applications

## **CORE X: DATA SCIENCE & ANALYTICS**

## **COURSE OUTCOMES**

- 1. Understand the concept of data science and its techniques.
- 2. Review data analytics
- 3. Apply and determine appropriate Data Mining techniques using R to real time applications
- 4. Analyze on clustering algorithms
- 5. Analyze on regression methods in AI

## CORE -PRACTICAL V: DIGITAL IMAGE PROCESSING Using MATLAB

## **COURSE OUTCOMES**

- 1. To write programs in MATLAB for image processing using the techniques
- 2. To able to implement Image Enhancements & Restoration techniques.
- 3. Capable of using Compression techniques in an Image
- 4. Must be able to manipulate the image and Segment it

## **CORE -PRACTICAL VI: CLOUD COMPUTING LAB**

- 1. Understand the concepts of object oriented with respect to C++
- 2. Able to understand and implement OOPS concepts
- 3. Implementation of data structures like Stack, Queue, Tree, List using C++
- 4. Application of the data structures for Sorting, Searching using different techniques.

## **SEMESTER IV**

# CORE – PRACTICAL VII: WEB APPLICATION DEVELOPMENT AND HOSTING COURSE OUTCOMES

- 1. Understand & implement the basic HTML tags to create static web pages
- 2. Capable of using hyperlinks, frames, images, tables, ....in a web page
- 3. Able to write dynamic web applications using HTML forms
- 4. Must be able to write dynamic web applications in PHP & HTML tags using XAMPP.

# ELECTIVE -COURSE III: CRITICAL THINKING, DESIGN THINKING AND PROBLEM SOLVING

#### **COURSE OUTCOMES**

- 1. Understand the concepts of Critical thinking and its related technology
- 2. Focus on the explicit development of critical thinking and problem solving skills
- 3. Apply design thinking in problems
- 4. Make a decision and take actions based on analysis
- 5. Analyze the concepts of Thinking patterns, Problem solving & Reasoning in real time applications

#### **ELECTIVE -COURSE III: WEB SERVICES**

- 1. Understand web services and its related technologies
- 2. Understand XML concepts
- 3. Analyze on SOAP and UDDI model
- 4. Demonstrate the road map for the standards and future of web services
- 5. Analyze QoS enabled applications in web services

## ELECTIVE -COURSE III: ROBOTIC PROCESS AUTOMATION FOR BUSINESS

## **COURSE OUTCOMES**

- 1. Demonstrate the benefits and ethics of RPA
- 2. Understand the Automation cycle and its techniques
- 3. Draw inferences and information processing of RPA
- 4. Implement & Apply RPA in Business Scenarios
- 5. Analyze on Robots & leveraging automation

#### SUPPORTIVE – PRINCIPLES OF INFORMATION TECHNOLOGY (EDC)

#### **COURSE OUTCOMES**

- 1. Understand the basics of information technology
- 2. Gain the knowledge of Hardware and Software technologies
- 3. Learn the method of organizing data
- 4. Assess the role of Information Science to an organization.
- 5. Understanding the role of IT in organizations

## SUPPORTIVE – FUNDAMENTALS OF COMPUTERS AND COMMUNICATION (EDC)

- 1. Know the basics and internal parts of Computers
- 2. Gain the knowledge on OS and its types
- 3. Understand the basics of networks and Internet
- 4. Learn the databases and DBMS concepts
- 5. Understand the role of RDBMS in IT

## **SUPPORTIVE – E-COMMERCE (EDC)**

#### **COURSE OUTCOMES**

- 1. Learn the introduction on e-commerce
- 2. Understand the mercantile and consumer process models
- 3. Analyse the consumers and merchant's perspective on e-commerce
- 4. Getting an idea on Electronic Data Interchange
- 5. Gaining the knowledge on Internet

## SUPPORTIVE – DATA VISUALIZATION LAB

## **COURSE OUTCOMES**

- 1. Enable to create and apply Spread sheet and Tableau for various data processing
- 2. Gains knowledge to create and design various visualization tools in Excel and Tableau.
- 3. Comprehend, create and deploy labels and heat map.
- 4. Enable to create and apply dashboard for various data processing
- 5. Illustrate and apply data visualization tool for any data set

#### SUPPORTIVE - SKILL DEVELOPMENT LAB

- 1. Improves the professional communication skills
- 2. Apply useful words in the correct situation
- 3. Improves the listening and reading skills
- 4. Acquire the leadership qualities
- 5. Improves the writing ability