

# **Y.A.Govt.Degree College Women,Chirala**

## **Department of Computer Science**

### **B.SC**

#### **Course Learning Outcomes**

##### **PAPER 1: PROBLEM SOLVING IN C**

- Understand the evolution and functionality of a Digital Computer.
- Apply logical skills to analyses a given problem.
- Develop an algorithm for solving a given problem.
- Understand “C” language constructs like Iterative statements, Array processing, Pointers, etc.
- Apply “C” language constructs to the algorithms to write a “C” language program.

##### **PAPER 2: DATA STRUCTURES USING C**

- Understand available Data Structures for data storage and processing.
- Comprehend Data Structure and their real-time applications - Stack, Queue, Linked List, Trees and Graph.
- Choose a suitable Data Structures for an application.
- Develop ability to implement different Sorting and Search methods.
- Have knowledge on Data Structures basic operations like insert, delete, search, update and traversal.
- Design and develop programs using various data structures.
- Implement the applications of algorithms for sorting, pattern matching etc.

##### **PAPER 3: DATABASE MANAGEMENT SYSTEMS**

- Gain knowledge of Database and DBMS.
- Understand the fundamental concepts of DBMS with special emphasis on relational data model.
- Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
- Model database using ER Diagrams and design database schemas based on the model.
- Create a small database using SQL.
- Store, Retrieve data in database.

##### **PAPER 4: OBJECT ORIENTATED PROGRAMMING THROUGH JAVA**

- Understand the benefits of a well-structured program.
- Understand different computer programming paradigms.
- Understand underlying principles of Object-Oriented Programming in Java.
- Develop problem-solving and programming skills using OOP concepts.
- Develop the ability to solve real-world problems through software development in high-level programming language like Java.

## **PAPER 5: OPERATING SYSTEMS**

- Know Computer system resources and the role of operating system in resource management with algorithms.
- Understand Operating System Architectural design and its services.
- Gain knowledge of various types of operating systems including Unix and Android.
- Understand various process management concepts including scheduling, synchronization, and deadlocks.
- Have a basic knowledge about multithreading.
- Comprehend different approaches for memory management.
- Understand and identify potential threats to operating systems and the security features design to guard against them.
- Specify objectives of modern operating systems and describe how operating systems have evolved over time.
- Describe the functions of a contemporary operating system

## **PAPER 6A: Web Interface Designing Technologies**

- Understand and appreciate the web architecture and services.
- Gain knowledge about various components of a website.
- Demonstrate skills regarding creation of a static website and an interface to dynamic website.
- Learn how to install word press and gain the knowledge of installing various plugins to use in their websites.

## **PAPER 6A: Web Interface Designing Technologies – PRACTICAL**

- Create a basic website with the help of HTML and CSS.
- Acquire the skill of installing word press and various plugins of Word press.
- Create a static website with the help of Word press.
- Create an interface for a dynamic website.
- Apply various themes for their websites using Word press.
- PAPER 7A: Web Applications Development using PHP & MYSQL
- Write simple programs in PHP.
- Understand how to use regular expressions, handle exceptions, and validate data using PHP.
- Apply In-Built functions and Create User defined functions in PHP programming.
- Write PHP scripts to handle HTML forms.
- Write programs to create dynamic and interactive web based applications using PHP and MYSQL.
- Know how to use PHP with a MySQL database and can write database driven web pages.

## **PAPER 7A: Web Applications Development using PHP & MYSQL– PRACTICAL**

- Write, debug and implement the Programs by applying concepts and error handling techniques of PHP.

- Create an interactive and dynamic website.
- Create a website with reports generated from a database.
- Write programs to create an interactive website for e-commerce sites like online shopping, etc.

### **PAPER 6B: INTERNET OF THINGS**

- Appreciate the technology for IoT.
- Understand various concepts, terminologies and architecture of IoT systems.
- Understand various applications of IoT.
- Learn how to use various sensors and actuators for design of IoT.
- Learn how to connect various things to Internet.
- Learn the skills to develop simple IOT Devices.

### **PAPER 6B: Internet of Things – PRACTICAL**

- Acquire the skills to design a small IoT device.
- Connect various sensors, actuators, etc to Arduino board.
- Connect the things to Internet.
- Design a small mobile app to control the sensors.
- Deploy a simple IoT device.

### **PAPER 7B: APPLICATION DEVELOPMENT USING PYTHON**

- Understand and appreciate the web architecture and services.
- Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
- Demonstrate proficiency in handling Strings and File Systems.
- Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
- Interpret the concepts of Object-Oriented Programming as used in Python.
- Apply concepts of Python programming in various fields related to IOT, Web Services and Databases in Python.

### **PAPER 7B: Application Development Using Python– PRACTICAL**

- Implement simple programs in Python.
- Implement programs related to various data structures like lists, dictionaries, etc.
- Implement programs related to files.
- Implement applications related to databases, Web services and IOT.

### **PAPER 6C: DATA SCIENCE**

- Develop relevant programming abilities.
- Demonstrate proficiency with statistical analysis of data.
- Develop the ability to build and assess data-based models.
- Demonstrate skill in data management.

- Apply data science concepts and methods to solve problems in real-world contexts and will communicate these solutions effectively.

### **PAPER 6C: Data Science – PRACTICAL**

- Apply data science solutions to real world problems.
- Implement the programs to get the required data, process it and present the outputs using Python language.
- Execute statistical analyses with Open source Python software.

### **PAPER 7C: Python for Data Science**

- Identify the need for data science and solve basic problems using Python built-in data types and their methods.
- Design an application with user-defined modules and packages using OOP concept.
- Employ efficient storage and data operations using NumPy arrays.
- Apply powerful data manipulations using Pandas.
- Do data pre-processing and visualization using Pandas

### **PAPER 7C: Python for Data Science – PRACTICAL**

- Implement simple programs in Python.
- Implement programs related to various structures like arrays, lists, Data frames, etc.
- Implement programs related to files.
- Implement applications related to data science.

## **B.SC – DATA SCIENCE**

### **Course Learning Outcomes**

#### **Paper 2: INTRODUCTION TO DATA SCIENCE WITH R**

- Recognize various disciplines that contribute to a successful data science effort.
- Understand the processes of data science - identifying the problem to be solved, data collection, preparation, modeling, evaluation and visualization.
- Be aware of the challenges that arise in data sciences.
- Develop and appreciate various techniques for data modeling and mining.
- Be cognizant of ethical issues in many data science tasks.
- Be comfortable using commercial and open source tools such as the R language and its associated libraries for data analytics and visualization.
- Learn skills to analyze real time problems using R.
- Able to use basic R data structures in loading, cleaning the data and preprocessing the data.
- Able to do the exploratory data analysis on real time datasets.
- Able to understand and implement Linear Regression.

- Able to understand and use - lists, vectors, matrices, data frames, etc.

### **PAPER 3: BIG DATA TECHNOLOGY**

- Learn tips and tricks for Big Data use cases and solutions.
- Acquire knowledge of HDFS components, Namenode, Datanode, etc.
- Acquire knowledge of storing and maintaining data in cluster, reading data from and writing data to Hadoop cluster.
- Able to maintain files in HDFS.
- Able to write MapReduce applications to access data present on HDFS.
- Able to read different formats of files into map-reduce application.
- Able to develop MapReduce applications to analyze Big Data related to the real world use cases.
- Able to write MapReduce applications that can take data from multiple datasets and join them.
- Able to optimize the performance of Map-Reduce application

### **Paper 4: DATA MINING AND DATA ANALYSIS**

- To understand and demonstrate data mining.
- Compare various conceptions of data mining as evidenced in both research and application.
- Characterize various kinds of patterns that can be discovered by association rule mining.
- Evaluate mathematical methods underlying the effective application of data mining.
- To Analyze the data using statistical methods 6. Gain hands-on skills and experience on data mining tools.

### **Paper 5: BIG DATA ACQUISITION AND ANALYSIS**

- Identify the various sources of Big Data.
- Able to collect and store Big Data from various sources.
- Able to write Pig Scripts- Extract, Transform and Load the data on HDFS.
- Able to write Hive Scripts- Extract, Transform, Load and Analyze the data present in HDFS.
- Able to write scripts to extract data from structured and un-structured data for analytics.
- Able to extract and process semi and un-structured data using HBase.

### **Paper 6A: Data Analytics with Tableau**

- Understand Big Data and its usage.
- Identify various Data Quality and preprocessing methods.
- Learn different Clustering techniques and Frequent pattern Mining.
- Understand Regression, classification and additional predictive t method,

### **Paper 7A: AI Concepts and Techniques with Python**

- List the objectives and functions of modern Artificial Intelligence.
- Categorize an AI problem based on its characteristics and its constraints.
- Understand and implement search algorithms.
- Learn how to analyze the complexity of a given problem and come with suitable optimizations.
- Demonstrate practical experience by implementing and experimenting with the learnt algorithms.

### **Paper 6B: Supervised ML with Python**

- Able to understand introduction to machine learning concepts.
- Able to Loading datasets, build models and model persistence.
- Understand Feature extraction from data sets.
- Able to do Regression & Classification.
- Able to compare SVM with other classifiers

### **Paper 7B: Unsupervised ML with Python**

- Able to do Clustering, feature extraction and optimization.
- Students will be able to understand and implement in Python algorithms of Unsupervised
- Machine Learning and apply them to real-world datasets.

### **Paper 6C: NLP with Python**

- Able to describe the fundamental concepts and techniques of natural language processing.
- Use appropriate descriptions, visualizations, and statistics to communicate the problems and their solutions.
- Analyze large volume text data generated from a range of real-world applications.
- Understanding semantics and pragmatics of English language for processing
- Ability to distinguish among the various techniques, taking into account the assumptions, strengths, and weaknesses of each.
- Writing programs in Python to carry out natural language processing.

### **Paper 7C: Deep Learning Neural Networks with Python**

- Solve problems in linear algebra probability, optimization, and machine learning.
- The advantages and disadvantages of deep learning neural network architectures and other approaches.
- Implement deep learning models in Python using the PyTorch library and train them with real-world datasets.
- Design convolution networks for handwriting and object classification from images or video.

- **Design recurrent neural networks with attention mechanisms for natural language classification, generation, and translation.**