**MASTER OF SCIENCE (COMPUTER SCIENCE)**

**SEMESTER – I**

**CORE I: DESIGN AND ANALYSIS OF ALGORITHMS (21PCS01)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: It gives step-by-step procedures to solve problems.

**CO2**: The problems can be broken down into small pieces for programme development.

**CO3**: Efficient approach to solving problems by a model of computations

**CO4**: Decide and apply algorithmic strategies to solve given problems.

**CO5**: Find the optimal solution by applying various methods.

**CORE II: DISTRIBUTED OPERATING SYSTEM (21PCS02)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: A clear understanding of several resource management techniques, like distributed shared memory and other resources.

**CO2**: Knowledge on mutual exclusion and deadlock detection of distributed operating systems

**CO3**: Able to design and implement algorithms for distributed shared memory and commit protocols

**CO4**: Able to design and implement fault-tolerant distributed systems

**CO5**: Implementation of virtual memory and file systems

**CORE III: ADVANCED JAVA PROGRAMMING (21PCS03)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Able to develop a Graphical User Interface (GUI) with Applet and Swing

**CO2**: Develop a client-server application with database maintenance.

**CO3**: Finally, students will develop an understanding of the Java language class hierarchy, including the cosmic object superclass.

**CO4**: Students will design and implement programmes in the Java programming language that make strong use of classes and objects.

**CO5**: Finally, students will develop an understanding of the Java language class hierarchy, including the cosmic object superclass.

**CORE IV: INTERNET OF THINGS (21PCS04)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Gain basic knowledge about IOT, and they will be able to use IOT-related products in real life.

**CO2**: It helps to rely less on physical resources and start to do their work smarter.

**CO3**: Able to understand the building blocks of the Internet of Things and their characteristics

**CO4**: Able to build the physical and logical design of IOT systems.

**CO5**: Understand cloud platforms for IOT.

**ELECTIVE – I: ADVANCED COMPUTER ARCHITECTURE (21PCSE01)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Parallel computer architecture, design, and micro-operations

**CO2**: Interconnection of networks and synchronisation mechanisms

**CO3**: Develop design skills for instruction sets.

**CO4**: Know how to design a pipelined data path.

**CO5**: Interpret the performance of different pipelined processors.

**CORE- V - ADVANCED JAVA PROGRAMMING LAB (21PCSP01)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Summarise the strengths and weaknesses of Java programming and the basic concepts of object-oriented programming.

**CO2**: Identify Java code utilities in applets, Java packages, and classes.

**CO3**: Write Java code using advanced Java features.

**CO4**: Develop reusable components for graphic user interface applications.

**CO5**: Apply the concepts of server-side technologies for dynamic web applications

**CORE VI – ALGORITHM USING C++ LAB (21PCSP02)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: an ability to incorporate exception handling in object-oriented programmes

**CO2**: an ability to use template classes and the STL library in C++

**CO3**: an understanding of the concepts of OOPs, including inheritance and polymorphism

**CO4**: an ability to overload operators in C++

**CO5**: An understanding of the difference between function overloading and function overriding

**SEMESTER-II**

**CORE VII: ADVANCED WEB TECHNOLOGY (21PCS05)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Design a web page with web form fundamentals and web control classes.

**CO2**: Recognise the importance of validation control, cookies, and sessions.

**CO3**: Apply the knowledge of ASP.NET objects, ADO.NET data access, and SQL to develop a client-server model.

**CO4**: Recognise the difference between data lists and DataGrid controls when accessing data.

**CO5**: Define the fundamental principles for cloud applications.

**CORE VIII: COMPILER DESIGN (21PCS06)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: On the successful completion of this course, students will be able to: Use the knowledge of patterns, tokens, and regular expressions for solving a problem.

**CO2**: To channel students' thinking towards a basic understanding of legal concepts and their implications for engineers.

**CO3**: Understand the target machine’s runtime environment, its instruction set for code generation, and techniques used for code optimisation.

**CO4**: Understand the parser and its types, i.e., top-down and bottom-up parsers, and the construction of LL, SLR, CLR, and LALR parsing tables.

**CO5**: Acquire knowledge about run-time data structure, like symbol table organisation and the different techniques used in that.

**CORE X: DATA MINING (21PCS07)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Identify the key processes of data mining, data warehousing, and the knowledge discovery process.

**CO2**: Understand the basic principles and algorithms used in practical data mining and their strengths and weaknesses.

**CO3**: Apply basic, intermediate, and advanced techniques to mine the data.

**CO4**: Analyze the output generated by the process of data mining.

**CO5**: Explore the hidden patterns in the data.

**ELECTIVE II: SOFT COMPUTING (21PCSE04)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Comprehend the fuzzy logic and the concept of fuzziness involved in various systems and fuzzy set theory.

**CO2**: Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic.

**CO3**: To understand the fundamental theory and concepts of neural networks, Identify different neural network architectures, algorithms, applications, and their limitations.

**CO4**: Understand appropriate learning rules for each of the architectures and learn several neural network paradigms and their applications.

**CO5**: Reveal different applications of these models to solve engineering and other problems.

**CORE-X: WEB TECHNOLOGY LAB (21PCSP03)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Create user-interactive web pages using ASP.NET.

**CO2**: Explain how to create dynamic Web pages by using ASP.NET.

**CO3**: Configure an ASP.NET application by using...

**CO4**: Create a user interface on an ASP.NET page by using standard Web server controls.

**CO5**: Create a user control and a custom server control and add them to an ASP.NET page.

**CORE-XI – DATA MINING LAB (21PCSP04)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Show the installation of the R programming environment.

**CO2:** Utilise R data types for developing programs.

**CO3:** Make use of different R data structures.

**CO4**: Analyse data and generate reports based on the data.

**CO5**: Apply various concepts to writing programmes in R.

**SEMESTER III**

**CORE: XII- OPEN SOURCE COMPUTING (21PCS08)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Ability to build and modify one or more free and open source software packages; ability to use a version control system; and ability to interface with version control systems used by development communities.

**CO2**: Understand the kernel configuration and virtual environment.

**CO3**: To expose students to a free open source software environment and introduce them to use open source packages.

**CO4**: Implement various applications using build systems.

**CO5**: Understand the installation of various packages in open-source operating systems.

**CORE XIII – DIGITAL IMAGE PROCESSING (21PCS09)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Review the fundamental concepts of a digital image processing system and analyse images in the frequency domain using various transforms.

**CO2**: Describe basic image-related concepts.

**CO3**: Evaluate the techniques for image enhancement and image restoration. Categorise various compression techniques.

**CO4**: Interpret image compression standards and interpret image segmentation and representation techniques.

**CO5**: Gain an idea of how to process various images used in various fields, such as weather forecasting and Diagnosis of various diseases using images such as tumours, cancer, etc.

**CORE: XIV – BIG DATA ANALYTICS (21PCS10)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Understand Big Data and its analytics in the real world

**CO2**: Able to participate in data science and big data analytics projects

**CO3**: Analyse the big data frameworks like Hadoop and NOSQL to efficiently store and process big data to generate analytics.

**CO4**: Design and Implementation of Big Data Analytics Using Pig and Spark to Solve Data-Intensive Problems and Generate Analytics

**CO5**: Implement big data activities using Hive

**ELECTIVE III – CLOUD COMPUTING (21PCSE08)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: A good understanding of cloud computing and a systematic knowledge of the fundamental technologies, architecture, and security.

**CO2**: Apply fundamental concepts in cloud infrastructures to understand the tradeoffs in power, efficiency, and cost, and then study how to leverage and manage single and multiple datacenters to build and deploy cloud applications that are resilient, elastic, and cost-efficient.

**CO3**: Discuss system, network, and storage virtualization and outline their role in enabling the cloud computing system model.

**CO4**: Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS.

**CO5**: Analyse various cloud programming models and apply them to solve problems in the cloud.

**ELECTIVE IV – WAP AND XML (21PCSE10)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Apply XML concepts to develop web applications.

**CO2**: Develop SOA applications using XML and web services.

**CO3**: Extract information from the websites using XML programming.

**CO4**: Develop interactive real-time applications.

**CO5**: Design web sites using XSL Style Sheets.

**CORE-XV: DIGITAL IMAGE PROCESSING LAB (21PCSP05)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**:  Apply image enhancement and restoration techniques.

**CO2**: Use image compression and segmentation techniques.

**CO3**: Analyse images in the frequency domain using various transforms.

**CO4**: Evaluate the techniques for image enhancement and image restoration.

**CO5**: Categorise various compression techniques.

**MINI PROJECT (21UCSPR1)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Students will be able to practice acquired knowledge within the chosen area of technology for project development.

**CO2**: Identify, discuss, and justify the technical aspects of the chosen project with a comprehensive and systematic approach.

**CO3**: Understand how to identify the issues and challenges of industry.

**CO4**: Prepare a report on the application of emerging technologies in the selected industry.

**CO5**: Understand how to develop the project.

**SEMESTER IV**

**CORE: XVII – MACHINE LEARNING (21PCS11)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc.

**CO2**: Have an understanding of the strengths and weaknesses of many popular machine learning approaches.

**CO3**: Appreciate the underlying mathematical relationships within and across machine learning algorithms and the paradigms of supervised and unsupervised learning.

**CO4**: Be able to design and implement various machine learning algorithms in a range of real-world applications.

**CO5**: Understand how to evaluate models generated from data.

**ELECTIVE: V - CRYPTOGRAPHY AND NETWORK SECURITY (21PCSE15)**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Understand the fundamentals of network security, security architecture, threats, and vulnerabilities.

**CO2**: Apply the different cryptographic operations of symmetric cryptographic algorithms.

**CO3**: Apply the different cryptographic operations of public key cryptography.

**CO4**: Apply the various authentication schemes to simulate different applications.

**CO5**: Understand various security practices and system security standards.

**CORE – XVIII – PROJECT WORK AND VIVA-VOCE**

**COURSE OUTCOMES (COs):**

After the successful completion of this course, the students will be able to

**CO1**: Demonstrate a sound technical knowledge of their selected project topic.

**CO2**: Undertake problem identification, formulation, and solution.

**CO3**: Design engineering solutions to complex problems utilising a systems approach.

**CO4**: Understand how to identify the issues and challenges of industry.

**CO5**: Prepare a report on the application of emerging technologies in the selected industry.