SRIVASAVIENGINEERING COLLEGE (Autonomous)

Department of Computer Science and Engineering

PROGRAMME NAME: M.TECH (COMPUTER SCIENCE)

Course Outcomes (V21 Regulation)

Semester	Course Code & Name	Course Outcomes
I Semester	V21CTT01 **Mathematical Foundations of Computer Science**	**After Successful completion of the Course, the student will be able to:** 1. Demonstrate skills in solving mathematical problems, mathematical principles and logic. 2. Demonstrate the basic concepts associated with set theory, relations, functions and their applications. 3. Illustrate algebraic structures and concepts associated with Number Theory and their applications in Computer Science. 4. Manipulate and consider data numerically by using combinatorics. 5. Solve recurrence relations using various methods apply techniques of graphs for real-time problems.
I Semester	V21CTT02 **Advanced Data Structures**	**After Successful completion of the Course, the student will be able to:** 1. Select appropriate data structures as applied to specified problem definition. 2. Apply data structures such as linked list and trees on necessary applications. 3. Practice all data structures like stacks, queues, trees, graphs and compare their performance. 4. Discuss operations like searching, insertion, deletion and traversing on various data structures. 5. Apply data structures into the applications such as binary search trees, AVL, Red black trees.
I Semester	V21CTT03 **Advanced Operating Systems (Elective-I)**	**After Successful completion of the Course, the student will be able to:** 1. Explain architectures and issues in Distributed Operating Systems. 2. Illustrate different Distributed Mutual Exclusion Algorithms and Distributed Deadlock Algorithms. 3. Demonstrate Distributed Scheduling Algorithm and Distributed Shared Memory. 4. Apply various Cryptographic Algorithms for the protection of given data. 5. Demonstrate Multiprocessor Scheduling Algorithms and Concurrency Control Algorithms.
I Semester	V21CTT04 **Advanced Computer Architecture (Elective-I)**	**After Successful completion of the Course, the student will be able to:** 1. Classify the types of computers, and new trends and developments in computer architecture. 2. Describe pipelining, instruction set architectures, memory addressing. 3. Demonstrate exploiting ILP using dynamic scheduling, multiple issue, and speculation. 4. Demonstrate the various techniques to enhance a processors ability to exploit Instruction level parallelism (ILP), and its challenges. 5. Illustrate multithreading by using ILP and supporting thread-level parallelism (TLP).

	V21CTT05	**After Successful completion of the Course, the student will be able to:**
I Semester	**Parallel Computing (Elective-I)**	1. Describe different parallel architectures; inter-connect networks, programming models, and algorithms for common operations such as matrix-vector multiplication. 2. Develop an efficient parallel algorithm to solve it. 3. Illustrate a parallel algorithm time complexity as a function of the problem size and number of processors. 4. Illustrate Matrix Multiplication and Sorting Techniques. 5. Explain parallel algorithm using MPI, Open MP, p threads, or a combination of MPI and Open MP.
I Semester	V21CTT06 **Advanced Databases (Elective-II)**	**After Successful completion of the Course, the student will be able to:** 1. Explain Distributed Database Process, Architecture, and Design Principles. 2. Apply Distributed Query Optimization Techniques and Algorithms. 3. Illustrate and apply Concurrency Control and Reliability Techniques. 4. Illustrate Need of Complex Data type like ORDBMS and OODBMS. 5. Identify Emerging Database Models and case study on Time Series Database.
I Semester	V21CTT07 **Advanced Computer Networks (Elective-II)**	**After Successful completion of the Course, the student will be able to:** 1. Describe the functionalities and services provided by the network layer. 2. Apply IP addressing for the given network. 3. Select the transport protocol appropriate for a given application. 4. Discriminate between different types of multimedia communications. 5. Describe the working, types and challenges involved in Adhoc networks& SDN.
I Semester	V21CTT08 **Object Oriented Software Engineering (Elective-II)**	**After Successful completion of the Course, the student will be able to:** 1. Apply the Object Oriented Software-Development Process to design software. 2. Illustrate the Object Oriented Software Architecture & Design patterns. 3. Examine the Design and Plan software solutions to problems using object-oriented Testing strategies. 4. Illustrate the Object Oriented metrics for designing the projects. 5. Develop the CASE Tools & Integrated CASE environments for Object Oriented Software.
I Semester	V21MBT55 **Research Methodology and IPR**	**After Successful completion of the Course, the student will be able to:** 1. Discuss different methodologies and techniques used in research work. 2. Explain basic computer skills necessary for the conduct of research. 3. Assess the basic function and working of analytical instruments used in research. 4. Practice the required numerical skills necessary to carry out research. 5. Demonstrate a capacity to identify, apply and assess ownership rights and marketing protection under intellectual property law as applicable to information, ideas, new products and product marketing.
I Semester	V21CTL01 **Advanced Data Structures Lab**	**After Successful completion of the Course, the student will be able to:** 1. Develop solutions for a range of problems using object oriented programming. 2. Practice complex problems using advanced data structures like arrays, stacks, queues, linked lists, graphs and trees. 3. Practice operations like searching, insertion, deletion and traversing on various data structures. 4. Apply data structures into the applications such as binary search trees, AVL, Red black trees. 5. Differentiate various hash functions
I Semester	V21CTL02 **Advanced Operating Systems Lab**	**After Successful completion of the Course, the student will be able to:** 1. Demonstrate deadlock avoidance and detection algorithms in a distributed environment. 2. Demonstrate efficient clock synchronization and election algorithms. 3. Describe Client server architecture.

I Semester	V21CTL03 **Parallel Computing Lab**	**After Successful completion of the Course, the student will be able to:** 1. Develop an efficient parallel algorithm to solve it. 2. Use parallel algorithm using MPI, Open MP, p threads, or a combination of MPI and Open MP
I Semester	V21CTL04 **Advanced Computer Networks Lab**	**After Successful completion of the Course, the student will be able to:** 1. Demonstrate various routing protocols. 2. Develop sub netting and addressing IP. 3. Develop emerging trends and security issues in computer Networks.
I Semester	V21CTL05 **Object Oriented Software Engineering Lab**	**After Successful completion of the Course, the student will be able to:** 1. Apply software solutions to problems using an object-oriented strategy. 2. Construct the object oriented software systems Model using Unified Modeling Language.(UML)
II Semester	V21CTT09 **Web Technologies**	**After Successful completion of the Course, the student will be able to:** 1. Demonstrate the basics of JavaScript. 2. Illustrate the concepts of XML and AJAX. 3. Produce Dynamic web pages with PHP and My SQL. 4. Use PERL to retrieve documents from the web. 5. Describe the fundamentals of RUBY Programming.
II Semester	V21CTT10 **Data Science through Python Programming**	**After Successful completion of the Course, the student will be able to:** 1. Illustrate the python basics and the working of various built-in objects in Python. 2. Describe the process of data collection using python. 3. Manipulate data using Pandas and Num Py libraries of python. 4. Apply various techniques for cleaning and pre-processing the data. 5. Demonstrate data visualization techniques using python mat plot lib.
II Semester	V21CTT11 **Machine Learning (Elective –III)**	**After Successful completion of the Course, the student will be able to:** 1. Describe Knowledge for Productive use of Machine Learning and Diversity of Data 2. Demonstrate on Supervised and Computational Learning 3. Illustrate on Statistics in learning techniques and Logistic Regression. 4. Illustrate on Support Vector Machines and Perceptron Algorithm. 5. Construct a Multilayer Perceptron Networks and classification of decision tree.
II Semester	V21CTT12 **Ad Hoc & Sensor Networks (Elective –III)**	**After Successful completion of the Course, the student will be able to:** 1. Explain the Fundamental Concepts and applications of ad hoc and wireless sensor networks. 2. Describe the MAC protocol issues of ad hoc networks. 3. Describe routing protocols for ad hoc wireless networks with respect to TCP design issues. 4. Explain the concepts of network architecture and MAC layer protocol for WSN. 5. Discuss the WSN routing issues by considering QoS measurements.
II Semester	V21CTT13 **Internet of Things (Elective –III)**	**After Successful completion of the Course, the student will be able to:** 1. Describe the term 'internet of things' in different contexts. 2. Develop various protocols for IoT. 3. Develop a PoC of an IoT system using Rasperry Pi/Arduino 4. Apply data analytics and use cloud offerings related to IoT. 5. Demonstrate applications of IoT in real time scenario.

	V21CTT14	**After Successful completion of the Course, the student will be able to:**
II Semester	**Principles of Cyber Security (Elective-IV)**	1. Apply cyber security architecture principles. 2. Describe risk management processes and practices 3. Construct cyber security incidents to apply appropriate response 4. Differentiate system and application security threats and vulnerabilities. 5. Identify security tools and hardening techniques.
II Semester	V21CTT15 **Cloud Computing (Elective –IV)**	**After Successful completion of the Course, the student will be able to:** 1. Interpret the key dimensions of the challenge of Cloud Computing. 2. Examine the economics, financial and technological implications for selecting cloud computing for own organization. 3. Explain the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-based applications. 4. Examine the own organizations' needs for capacity building and training in cloud computing- related IT areas. 5. Illustrate Virtualization for Data-Center Automation.
II Semester	V21CTT16 **Natural Language Processing (Elective –IV)**	**After Successful completion of the Course, the student will be able to:** 1. Explain approaches to syntax and semantics in NLP. 2. Demonstrate approaches to discourse, generation, dialogue and summarization within NLP. 3. Explain current methods for statistical approaches to machine translation. 4. Identify machine learning techniques used in NLP, including hidden Markov models and probabilistic. 5. Explain context-free grammars, clustering and unsupervised methods, log-linear and discriminative models, and the EM algorithm as applied within NLP.
II Semester	V21CTL06 **Advanced Web Technologies Lab**	**After Successful completion of the Course, the student will be able to:** 1. Develop static web pages using HTML, CSS. 2. Demonstrate the concepts of JavaScript and DHTML. 3. Demonstrate the basic concepts of PHP and JSP. 4. Demonstrate the concepts of Extensible markup language & AJAX. 5. Develop dynamic Web Applications using PHP & My SQL.
II Semester	V21CTL07 **Data Science Applications with Python Lab**	**After Successful completion of the Course, the student will be able to:** 1. Use data science operations like data collection, management and storing. 2. Apply Python programming concepts in data science, including their real-world applications. 3. Develop data collection and management scripts using Python Pandas.
III Sem	V21CTT18 **Mobile Applications and Development (Elective-V)**	**After Successful completion of the Course, the student will be able to:** 1. Describe Installation and configuration of Android application development tools. 2. Develop applications using services and publishing android applications. 3. Demonstrate Android software development tools. 4. Illustrate debugging programs running on mobile devices. 5. Develop Android applications using server-less database like SQLite.
III Sem	V21CTT19 **Big Data Analytics (Elective-V)**	**After Successful completion of the Course, the student will be able to:** 1. Illustrate big data and its use cases from selected business domains. 2. Interpret and summarize No SQL and Cassandra 3. Discuss the HADOOP and Map Reduce technologies associated with big data analytics and explore on Big Data applications Using Hive. 4. Define the use of Apache Spark, RDDs etc. to work with datasets. 5. Assess real time processing with Spark Streaming.

	V21MBT56	**After Successful completion of the Course, the student will be able to:**
III Sem	**Operations Research (Open Elective)**	1. solve the linear programming problem. 2. solve Transportation and Assignment problems. 3. apply sequencing techniques to create the jobs. 4. solve problems of waiting lines. 5. apply the principles of Game theory to real world competitive situations.
III Sem	V21MBT56 **Cost Management of Engineering Projects (Open Elective)**	**After Successful completion of the Course, the student will be able to:** 1. Understand the cost management process and various costs involved in a project. 2. Understand various as pects of a project and related processes. 3. Analyze the concepts of Break even and CVP analysis. 4. Demonstrate quality management techniques besides budgeting strategies 5. Apply quantitative techniques for cost management.
Audit Course 1 &2	V21PGENT54 **English For Research Paper Writing**	**After Successful completion of the Course, the student will be able to:** 1. Present planning and preparation for breaking up long sentences by following word order and structuring 2. Clarify his/her findings by criticizing, hedging and paraphrasing to avoid plagiarism in writing the sections of the paper. 3. Construct the ability to review literature, methods, results, discussions and the final check. 4. Develop the key skills needed to write Title, Abstract, Introduction and Review of literature for a research paper. 5. Demonstrate the skills needed to write methods, results, the discussion and conclusions for Research Write-ups. 6. Employ useful phrases that ensure a paper for the first-time publication.
Audit Course 1 &2	V21STEAC1 **Disaster Management**	**After Successful completion of the Course, the student will be able to:** 1. Describe to student to have a idea on different natural hazards and disaster management. 2. Develop the student to understand manmade disaster and their management. 3. Prepare the student in such a way in order to understand building codes and vulnerability of disaster. 4. Illustrate to student about role of technology in disaster management. 5. Assess the importance of education and community preparedness in disaster management to student.
Audit Course 1 &2	V21PGENT55 **Value Education**	**After Successful completion of the Course, the student will be able to:** 1. Enumerate the societal values and Individual attitudes that lead to value based judgments. 2. Explain the need for value education that incorporates self-discipline, confidence, honesty and patriotism. 3. Develop the inner and external personality that transforms individual into a man of character. 4. Distinguish between character and competence, self-management and good health, mind your mind and self-control.
Audit Course 1 &2	V21PGENT53 **Stress Management By Yoga**	**After Successful completion of the Course, the student will be able to:** 1. Define 8 parts of Yoga (Ashtanga). 2. Discuss Yam and Niyam along with Dos and Don'ts in life. Interpret Ahimsa, satya, astheya,brahmacharya and aparigraha along with other concepts. 3. Practice Asan and Pranayam. Examine various yoga poses and their benefits for mind and body.
Audit Course 1 &2	V21PGENT52 **Personality Development through Life Enlightenmen t Skills**	**After Successful completion of the Course, the student will be able to:** 1. Relate Neetishatakam in developing versatile personality of students. 2. Employ Bhagavad Gita to lead the nation and mankind to peace and prosperity. 3. Connect students to Bhagavad Gita in order to develop personality and achieve highest goals in life.

Audit Course 1 &2	V21PGENT51 **Pedagogy Studies**	**After Successful completion of the Course, the student will be able to:** 1. Identify various theories of learning and recognize Research questions with an overview of methodology. 2. Review Pedagogical practices used by teacher in both formal and informal class room and design Curriculum. 3. Examine how teacher education and the school curriculum support effective pedagogy along with various pedagogical approaches and theories. 4. Show peer support for professional development and support from head teacher to develop curriculum and assessment. Find out the barriers involved in learning. 5. Find out the gaps and give directions for research design as per context.