SRI VASAVI ENGINEERING COLLEGE (Autonomous)

(Permanent Affiliation to JNTUK, Kakinada), PEDATADEPALLI, TADEPALLIGUDEM-534 101

Department of Computer Science and Engineering

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Department of Computer Science and Technology

Course Outcomes of B.Tech(CSE) & B.Tech(CST) -V23 Regulation

Semester	Course Code & Course Name	Course Outcomes
I	V23CMT01 Basic Civil & Mechanical Engineering	**After Successful completion of the Course, the student will be able to:** **Part - A:** **CO1:** Apply knowledge of fundamental laws. to analyze KCL, KVL, series & parallel circuits, ac fundamentals, average, RMS values. **(K3)** **CO2:** Understand the construction and operation of AC and DC Electrical machines, measuring instruments (PMMC, MI).**(K2)** **CO3:** Understand the various sources of energy, types of power plants and layout representation of electrical power systems, electricity bill calculations and safety measures. **(K2)** **Part - B:** **CO4:** Understand the semiconductor devices –Characteristics of diodes, transistors. **(K2)** **CO5:** Understand the basic electronic circuits - Rectifiers and power supplies, Amplifiers & Instrumentation. **(K2)** **CO6:** Apply knowledge of Number Systems, Logic gates, Boolean algebra, Truth Tables to solve Simple combinational circuit. **(K3)**
I	V23CHT01 Applied Chemistry	**After Successful completion of the Course, the student will be able to:** **CO1:** Solution for the particle in the one dimensional box and applications of MO theory.**(K3)** **CO2:** Classify the advanced materials and its applications in Technology.**(K3)** **CO3:** Associate concepts of Electro chemical sensors and designing Electro chemical energy storages **.(K3)** **CO4:** Summarize the importance of polymers and conducting polymers.**(K3)** **CO5:** Compile the Advance spectroscopy and its applications.**(K3)**
I	V23MAT01 Linear Algebra & Calculus	**After Successful completion of the Course, the student will be able to:** **CO1:** Apply matrix algebra techniques to solve engineering problems. **(K3)** **CO2:** Use Eigen values and Eigen vectors concept to find nature of quadratic form, inverse and powers of matrix. **(K3)** **CO3:** Apply mean value theorems to real life problems. **(K3)** **CO4:** Use the concepts of functions of several variables which is useful in optimization. **(K3)** **CO4:** Apply double and triple integrals of functions of several variables in two dimensions using Cartesian and polar coordinates and in three dimensions using cylindrical and spherical coordinates. **(K3)**
I	V23CST01 Introduction to Programming	**After Successful completion of the Course, the student will be able to:** **CO1:** Understand basics of computers, the concept of algorithm and algorithmic thinking. **(K2)** **CO2:** Analyze a problem and develop an algorithm to solve it. **(K3)** **CO3:** Implement various algorithms using the C programming language. **(K3)** **CO4:** Understand more advanced features of C language. **(K2)** **CO5:** Develop problem-solving skills and the ability to debug and optimize the code. **(K3)**

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I	**V23MET01** Engineering Graphics	**After Successful completion of the Course, the student will be able to:** **CO1:** Understand the principles of engineering drawing, including engineering curves, scales, orthographic and isometric projections.**(K3)** **CO2:**Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views. **(K3)** **CO3:** Understand and draw projection of solids in various positions in first quadrant. **(K3)** **CO4:** Explain principles behind development of surfaces. **(K3)** **CO5:** Prepare isometric and perspective sections of simple solids. **(K3)**
I	**V23CSL02** IT Workshop Lab	**After Successful completion of the Course, the student will be able to:** **CO1:** Demonstrate Hardware troubleshooting (**K3)** **CO2:** Understand Hardware components and inter dependencies.(**K2)** **CO3:** Employ safeguard measures of computer systems from viruses/worms. **(K3)** **CO4:** Report Document/ Presentation preparation. **(K2)** **CO5:** Compute calculations using spreadsheets.(**K3)**
I	**V23MEL01** Engineering Workshop Lab	**After Successful completion of the Course, the student will be able to:** **CO1:** Identify workshop tools and their operational capabilities. **(K2)** **CO2:** Practice on manufacturing of components using workshop trades including fitting, carpentry, foundry and welding. **(K3)** **CO3:** Apply fitting operations in various applications. **(K3)** **CO4:** Apply basic electrical engineering knowledge for House Wiring Practice. **(K3)**
I	**V23CHL01** Applied Chemistry Lab	**After Successful completion of the Course, the student will be able to:** **CO1:** Determine the cell constant and conductance of solutions. **(K4)** **CO2:** Prepare advanced polymer Bakelite materials. **(K3)** **CO3:** Measure the strength of an acid present in secondary batteries. **(K5)** **CO4:** Analyse the IR spectra of some organic compounds. **(K4)** **CO5:** Calculate strength of acid in Pb-Acid battery. **(K4)**
I	**V23CSL01** Computer Programming Lab	**After Successful completion of the Course, the student will be able to:** **CO1:** Read, understand and trace the execution of programs written in C language. **(K3)** **CO2:** Select the right control structure for solving the problem. **(K3)** **CO3:** Develop C programs which utilize memory efficiently using programming constructs like pointers. **(K3)** **CO4:** Develop, Debug and Execute programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C. **(K3)**
I	**V23SPT01** NSS/NCC/Scouts & Guides/Community Service	**After Successful completion of the Course, the student will be able to:** **CO1:** Understand the importance of discipline, character and service motto**.(K2)** **CO2:** Solve some societal issues by applying acquired knowledge, facts, and techniques.**(K3)** **CO3:** Examine human relationships by analyzing social problems. **(K3)** **CO4:** Determine to extend their help for the fellow beings and downtrodden people. **(K4)** **CO5:** Develop leadership skills and civic responsibilities.**(K3)**
II	**V23MAT02** Differential Equations & Vector Calculus	**After Successful completion of the Course, the student will be able to:** **CO1:**Applythe techniques of ordinary differential equations of first order and first degree related to various engineering fields. **(K3)** **CO2:**Apply the techniques of linear differential equations of higher order related to various engineering fields. **(K3)** **CO3:**Solve the first order linear PDE and homogeneous PDE by appropriate methods. **(K3)** **CO4:**Interpretthephysicalmeaningofgradient, curl and divergence. **(K3)** **CO5:**Findtheline, surface and volume integrals and their relations using vector calculus techniques. **(K3)**
II	**V23PHT01** Engineering Physics	**After Successful completion of the Course, the student will be able to:** **CO1**: Examine the intensity variation of light due to polarization, interference and diffraction. **(K3)** **CO2:** Describe the basics of crystals and their structures**.(K2)**

Semester	Course Code & Course Name	Course Outcomes
		CO3: Interpret the various types of polarization of dielectrics and classify the magnetic materials**.(K3)** **CO4:** Explain the basic concepts of Quantum Mechanics and apply it to one dimensional motion of particles**.(K2)** **CO5:** Examine the type of semiconductor using Hall effect**.(K3)**
II	**V23ENT01** Communicative English	**After Successful completion of the Course, the student will be able to:** **CO1:** Identify the main idea of the text using skimming and scanning methods of reading and Parts of Speech. Frame Sentences and questions using appropriate Punctuation and Vocabulary. **(K2)** **CO2:**Interpret the poem and write summary ,using appropriate vocabulary. Gain mastery over articles, prepositions and improve writing skills. **(K3)** **CO3:** Find the success formula after reading the text in detail to answer questions. Use appropriate tense and concord, and get acquainted with summarizing, note-making and paraphrasing . **(K3)** **CO4:** Employ reading skills to comprehend the given inspirational story. Find suitable vocabulary and format to draft Letters and Resume**.(K3)** **CO5:** Appraise the delivered lecture and text, recognize the contextual vocabulary, write Essays and prepare Presentations. **(K4)**
II	**V23EET01** Basic Electrical and Electronics Engineering	**After Successful completion of the Course, the student will be able to:** **CO1**:Apply Knowledge of fundamental laws to analyze AC and DC Electrical circuits**.(K3)** **CO2**: Understand the construction and operation of electrical machines and measuring instruments**.(K2)** **CO3**: Understand the layout of various power plants, electricity bill and safety measures. **(K2)** **CO4**: Understand the working of various semiconductor devices. **(K2)** **CO5**: Understand the basic electronic circuits. **(K2)** **CO6**: Apply knowledge of digital electronics to solve various combinational circuits. **(K3)**
II	**V23CST02** Data Structures	**After Successful completion of the Course, the student will be able to:** **CO1:** Explain the role of linear data structures in organizing and accessing data efficiently in algorithms. **(K2)** **CO2:** Design, implement, and apply linked lists for dynamic data storage, demonstrating understanding of memory allocation. **(K3)** **CO3:** Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems. **(K3)** **CO4:** Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues, and apply them appropriately to solve data management challenges. **(K3)** **CO5:** Develop novel solutions to small scale programming challenges involving data structures such as Trees, hashing. **(K3)**
II	**V23PHL01** Engineering Physics Lab	**After Successful completion of the Course, the student will be able to:** **CO1:** Operate optical instruments like travelling microscope and spectrometer. **(K3)** **CO2:** Estimate the wavelengths of different colours using diffraction grating. **(K2)** **CO3:** Plot the intensity of the magnetic field of circular coil carrying current with distance. **(K3)** **CO4:** Demonstrate the various experiments in the areas of optics, mechanics and Electronics .**(K3)** **CO5:** Calculate the band gap of a given semiconductor. **(K3)** **CO6:** Estimate Hall voltage and Hall coefficient of a given semiconductor using Hall effect**.(K2)**
II	**V23ENL01** Communicative English Lab	**After Successful completion of the Course, the student will be able to:** **CO1:** Identify vowels, consonant sounds, neutralization and accent rules for better listening and speaking comprehension. **(K1)** **CO2:** Collect suitable expressions and vocabulary to participate in JAM and Role plays. **(K1)** **CO3:** Arrange your ideas to draft an email, Resume and SOP. **(K1)**

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		CO4: Organize your ideas and prepare to give presentations in a professional manner and Debate rationally and cogently. **(K3)** **CO5:** Show team spirit and communicative skills in group discussion and preparation to attend interviews. **(K3)**
II	**V23EEL01** Electrical and Electronics Engineering Workshop Lab	**After Successful completion of the Course, the student will be able to:** **CO1**: Analyse the Electrical circuit design concept, power and power factor.**(K4)** **CO2:** Understand the operation and characteristics of Electrical Machines. **(K2)** **CO3:** Analyse various domestic loads of energy bill calculation.**(K4)** **CO4:** Understand the various characteristics of electronic devices. **(K2)** **CO5:** Development of the digital circuits for electronic device applications. **(K3)**
II	**V23CSL03** Data Structures Lab	**After Successful completion of the Course, the student will be able to:** **CO1:** Explain the role of linear data structures in organizing and accessing data efficiently in algorithms. **(K3)** **CO2:** Design, implement, and apply linked lists for dynamic data storage, demonstrating Understanding of memory allocation. **(K3)** **CO3:** Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems. **(K3)** **CO4:** Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues and apply them appropriately to solve data management challenges. **(K3)** **CO5:** Recognize scenarios where hashing is advantageous, and design hash-based solutions for specific problems. **(K3)**
II	**V23SPT02** Health and wellness, Yoga and sports	**After Successful completion of the Course, the student will be able to:** **CO1:** Discuss the importance of yoga and sports for Physical fitness and sound health. **(K2)** **CO2:** Demonstrate an understanding of health-related fitness components. **(K3)** **CO3:** Compare and contrast various activities that help enhance their health. **(K4)** **CO4:** Assess current personal fitness levels. **(K3)** **CO5:** Develop Positive Personality. **(K3)**
III	**V23MAT05** Discrete Mathematics & Graph Theory	**After Successful completion of the Course, the student will be able to:** **CO1**: Develop skills required for solving mathematical problems using mathematical logic.**(K3)** **CO2**: Demonstrate the set theory principles, relations and functions in real-time Situations. **(K3)** **CO3**:Apply the knowledge of combinatorics and recurrence relations in formulating and solving complex problems. **(K3)** **CO4**: Apply the graph theory principles and techniques in computer science-related Problems. **(K3)** **CO5**: Find shortest paths and minimal spanning trees using prim's and Kruskal's algorithms, BFS and DFS algorithms. **(K3)**
III	**V23MBT51** Managerial Economics and Financial Analysis	**After Successful completion of the Course, the student will be able to:** **CO1:** Understand the basic concepts of managerial economics, demand, and elasticity of demand and methods of demand forecasting.**(K2)** **CO2**: Interpret production concept, least cost combinations and various costs concepts indecision making.**(K3)** **CO3**: Differentiate various Markets and Pricing methods a long with Business cycles**(K2)** **CO4**: Prepare financial statements and its analysis.**(K3)** **CO5**: Assess various investment project proposals with the help of Capital Budgeting techniques for decision making.**(K3)**
III	**V23CST03** Digital Logic & Computer Organization	**After Successful completion of the Course, the student will be able to:** **CO1:** Explain different Data Representation and various Combinational Digital Logic Circuits.**(K2)** **CO2:** Explain various Sequential Digital Logic Circuits and basic Structure of Computers.**(K2)** **CO3:** Describe the basic concepts of Computer Arithmetic and Processor Organization.**(K2)**

Semester	Course Code & Course Name	Course Outcomes
		CO4: Illustrate different types of Memory and organization of Memory.**(K2)** **CO5:** Demonstrate the ways of accessing various Interfacing devices with Processor.**(K3)**
III	**V23CST04** Advanced Data Structures & Algorithm Analysis	**After Successful completion of the Course, the student will be able to:** **CO1:** Demonstrate asymptotic notation and non-linear data structures like AVL and B-Trees.**(K3)** **CO2:** Demonstrate graphs and divide and conquer technique.**(K3)** **CO3:** Use greedy approach to determine various problems.**(K3)** **CO4:** Apply Dynamic Programming and Backtracking techniques.**(K3)** **CO5:** Solve different problems using Branch and Bound ,NP Hard and NP Complete**.(K3)**
III	**V23CST05** Object Oriented Programming Through Java	**After Successful completion of the Course, the student will be able to:** **CO1:** Demonstrate the object-oriented programming principles with Java programming environment. **(K3)** **CO2:** Demonstrate the concepts like classes, objects, argument passing mechanism, overloading and overriding. **(K3)** **CO3:** Illustrate the concepts of arrays, inheritance and interfaces. **(K3)** **CO4:** Demonstrate packages , java libraries, exception handling, java I/O and File concepts. **(K3)** **CO5:**Illustrate the concepts of string handling, multithreading and Java FX GUI. **(K3)**
III	**V23CSL04** Advanced Data Structures and Algorithm Analysis Lab	**After Successful completion of the Course, the student will be able to:** **CO1:** Demonstrate programs on AVL Trees and Heap trees. **(K3)** **CO2:** Develop programs on Sorting algorithms and Graph traversal algorithms.**(K3)** **CO3:** Develop programs using Greedy and Dynamic programming technique. **(K3)** **CO4:** Develop programs using Backtracking and branch & Bound technique. **(K3)**
III	**V23CSL05** Object Oriented Programming Through Java Lab	**After Successful completion of the Course, the student will be able to:** **CO1:** Construct programs to handle classes and objects. **(K3)** **CO2:** Develop programs that incorporate inheritance and interfaces. **(K3)** **CO3:** Construct programs on exception handling and File I/O. **(K3)** **CO4:** Develop programs using multithreading and Java FX. **(K3)**
III	**V23CSSE01** Python Programming Lab	**After Successful completion of the Course, the student will be able to:** **CO1:** Illustrate basic concepts and control structures in python Programming. **(K3)** **CO2:** Demonstrate functions and packages. **(K3)** **CO3:** Construct python programs using structured data types. **(K3)** **CO4:** Develop programs on Files, Exception handling and OOPs Concepts. **(K3)** **CO5:** Construct programs for Data Analysis using Num Py and Pandas. **(K3)**
III	**V23MET09** Design Thinking & Innovation	**After Successful completion of the Course, the student will be able to:** **CO1:** Define the concepts related to design thinking. **(K1)** **CO2:** Explain the fundamentals of Design Thinking and innovation.**(K2)** **CO3:** Apply the design thinking techniques for solving problems in various sectors**.(K3)** **CO4:** Analyse to work in a multidisciplinary environment. **(K4)** **CO5:** Evaluate the value of creativity. **(K5)**
III	**V23ENT02** Professional Communicatio n Skills - I	**After Successful completion of the Course, the student will be able to:** **CO1:** Use vocabulary in regular chores of life with accuracy, make meaningful sentences, and describe people and their traits vividly. **(K3)** **CO2:** Distinguish between places of pilgrimage and holiday spots; describe incidents, things and process; and frame questions, statements and expressions. **(K4)** **CO3:** Demonstrate their knowledge of idioms which are similar to those of native speakers while speaking and writing and use phrases clearly and precisely to articulate their views that compare and contrast indianisms with native expressions and avoid common errors. **(K3)** **CO4:** Employ the vocabulary of netizens with ease and walk through the letters and emails for effective official correspondence and infer the accurate meaning of the homophones that are often confusing. **(K3)**

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		CO5: Summarize their profile; introduce themselves as well as others by incorporating their accomplishments and Sketch stories and anecdotes in an interesting and engaging manner that arouses curiosity of the audience. **(K5)**
IV	**V23MBT53** Universal Human Values	**After Successful completion of the Course, the student will be able to:** **CO1:** Understand the fundamentals of Natural Acceptance, Happiness and Prosperity. **(K2)** **CO2:** Identify one's self, and one's surroundings(family, society, nature).**(K2)** **CO3:** Apply what they have learnt to their own self in different day-to-day settings in real life. **(K3)** **CO4:** Explain human values with human relationship and human society.**(K2)** **CO5:** Identify the need for universal human values and harmonious existence. **(K2)** **CO6:** Develop as socially and ecologically responsible engineers. **(K2)**
IV	**V23MAT07** Probability & Statistics	**After Successful completion of the Course, the student will be able to:** **CO1:** Classify the concepts of data science and its importance.(**K2)** **CO2:** Interpret the association of characteristics and through correlation and regression tools. **(K3)** **CO3:** Apply discrete and continuous probability distributions. **(K2)** **CO4:** Construct the components of a classical hypothesis test**.(K3)** **CO5:**Apply the statistical inferential methods to test the hypothesis based on small and large samplings. **(K3)**
IV	**V23CST06** Operating Systems	**After Successful completion of the Course, the student will be able to:** **CO1:** Describe Operating System Services, System Calls, Building, Boosting and Debugging. **(K2)** **CO2:** Illustrate Process Management Concepts and CPU Scheduling Algorithms.**(K3)** **CO3:** Demonstrate Process Synchronization primitives and Deadlock handling techniques. **(K3)** **CO4:** Illustrate Memory Management Techniques and Page Replacement Algorithms. **(K3)** **CO5:** Describe File System Concepts and Mass Storage Structures. **(K2)**
IV	**V23CST07** Database Management Systems	**After Successful completion of the Course, the student will be able to:** **CO1:** Describe Database systems, various Data models and Database architecture. **(K2)** **CO2:** Develop various real time applications using Relational algebra and Relational calculus. **(K3)** **CO3:** Illustrate Nested queries and different types of joins. **(K3)** **CO4:** Apply various Normalization techniques to refine schema. **(K3)** **CO5:** Explain Transaction management, Concurrency control and Database indexing techniques. **(K2)**
IV	**V23CST08** Software Engineering	**After Successful completion of the Course, the student will be able to:** **CO1:** Demonstrate the evolution, development practices, and various software life cycle models. **(K3)** **CO2:** Illustrate project management techniques and explain requirements analysis and specification. **(K3)** **CO3:** Develop effective software designs, using agile methodologies and user interface principles. **(K3)** **CO4:** Apply coding practices, conduct thorough testing, and manage software quality. **(K3)** **CO5:** Distinguish the use of CASE tools, manage software maintenance, and implement software reuse strategies. **(K4)**
IV	**V23CSL06** Operating Systems Lab	**After Successful completion of the Course, the student will be able to:** **CO1:** Practice of UNIX fundamentals, commands & system calls. **(K3)** **CO2:** Construct programs using CPU scheduling algorithms. **(K3)** **CO3:** Demonstrate IPC, semaphores, monitors, deadlocks. **(K3)** **CO4:** Develop programs to solve Page replacement algorithms, file allocation strategies and memory allocation strategies. **(K3)**

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IV	**V23CSL07** Database Management Systems Lab	**After Successful completion of the Course, the student will be able to:** **CO1:** Construct SQL queries using DDL,DML and DCL commands. **(K3)** **CO2:** Experiment with nested queries, built-in functions and various constraints.**(K3)** **CO3:** Construct PL/SQL programs on Control structures, Cursors and Triggers. **(K3)** **CO4:** Develop a Java program to connect with a database using JDBC. **(K3)**
IV	**V23CSSE02** Full Stack Development –I	**After Successful completion of the Course, the student will be able to:** **CO1:** Illustrate HTML elements and their attributes for designing static web pages. **(K3)** **CO2:** Apply appropriate CSS styles to HTML elements. **(K3)** **CO3:** Demonstrate JavaScript Pre-defined and User-defined Objects. **(K3)** **CO4:** Develop dynamic web pages and validate forms using JavaScript. **(K3)**
IV	**V23CEAC01** Environmental Science	**After Successful completion of the Course, the student will be able to:** **CO1:** Illustrate multi disciplinary nature of environmental studies and various renewable and non-renewable resources. **(K3)** **CO2:** Outline flow and bio-geo- chemical cycles and ecological Pyramids. **(K4)** **CO3:** Ascertain various causes of pollution and solid waste management and related preventive measures. **(K5)** **CO4:** Discriminate Understand the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation. **(K4)** **CO5:** Illustrate the causes of population explosion, value education and welfare programs. **(K3)**
IV	**V23ENT02** Professional Communication Skills - II	**After Successful completion of the Course, the student will be able to:** **CO1:** Demonstrate grammatical competence, analyze noun and pronoun dispositions, classify various kinds of verbs, adjectives and adverbs and identify errors in sentences; distinguish the subtle meanings of various words in different contexts, recognize similar words as well as words with contrast meanings and use them appropriately. **(K3)** **CO2:** Organize individual words into one whole sentence using new vocabulary and focus on the error analysis of prepositions and conjunctions, build conversations which befit the situations and develop pre-reading strategies to improve comprehension skills. Distinguish and acquire knowledge of using words of the same category in a sentence and learn new words that promote communicative finesse. Find errors in sentences where the modifiers are misplaced and put them at the appropriate place, use hit pair words and send an email that is concise and lucid. **(K3)** **CO3:** Recognize the easiest and best possible way of solving problems in the area of Number and Letter Series, Analogy, Classification, Coding & Decoding Symbols, Ranking and Analytical Reasoning.**(K4)** **CO4:** Investigate the different types of logics involved in Mirror and Water Images, Logical Reasoning & Arithmetic Reasoning. **(K4)** **CO5:** Find the common traps in the questions and errors likely to be made from the concepts of Blood Relations, Directions, Average, Clock and Calendar, Data Sufficiency, Permutations-Combinations and Probability.**(K3)**