



# SRI VASAVI ENGINEERING COLLEGE(Autonomous)

(Permanent Affiliation to JNTUK, Kakinada), PEDATADEPALLI,TADEPALLIGUDEM-534101

Department of Computer Science and Engineering (Artificial Intelligence)

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Department of Artificial Intelligence & Machine Learning

## Course Outcomes (V20 Regulation)

Semester	Course Code & Name	Course Outcomes
I Semester	V20MAT01 <b>Linear Algebra and Differential Equations</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"><li>1. Apply matrix technique to solve system of linear equations</li><li>2. Find Eigen values and Eigenvectors</li><li>3. Solve the ordinary differential equations of first order &amp; first degree</li><li>4. Solve the linear differential equations of higher order with constant coefficients.</li><li>5. Find maxima and minima of functions of two variables.</li></ol>
I Semester	V20MAT09 <b>Descriptive Statistics</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"><li>1. Discuss about statistical methods</li><li>2. Find measures of central tendency and dispersion for real data sets.</li><li>3. Find the correlation and regression</li><li>4. Apply method of least square to find a best fit curve to an experimental data</li><li>5. Find the probability using various rules(K3)</li></ol>
I Semester	V20ENT01 <b>English for Professional Enhancement</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"><li>1. Identify the central theme of the text, use cohesive items for coherence in a paragraph, recognize nouns and basic sentence structures.</li><li>2. Restate the central idea of the letter by using appropriate vocabulary. Gain mastery over articles and prepositions.</li><li>3. Find the success formula after reading the text in detail to answer questions. Use appropriate tense and concord, find suitable vocabulary and format to draft letters and e-mails.</li><li>4. Employ reading skills to comprehend the given biography. Interpret visual information. Use quantifiers</li><li>5. Appropriately and get acquainted with formal drafting</li><li>6. Appraise the delivered lecture and text, recognize the contextual vocabulary and prepare poster presentations.</li></ol>
I Semester	V20AIL01 <b>Computer Engineering Workshop</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"><li>1. Identify, assemble and update the components of a computer.</li><li>2. Practiced is assembling and assembling components and execution of computer applications, services and systems.</li><li>3. Make use of tools for converting pdf to word and vice versa.</li><li>4. Develop presentation, documents and small applications using productivity tools such as word processor, presentation tools, spreadsheet, HTML, Latex.</li></ol>

<p><b>I Semester</b></p>	<p>V20CST01 <b>Programming in 'C' for problem Solving</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe various problem solving strategies such as Algorithms and Flow charts.</li> <li>2. Develop various programming constructs using Control Structures.</li> <li>3. Construct Programs using modular programming approach.</li> <li>4. Illustrate the usage of Arrays, String and pointers.</li> <li>5. Construct Programs using Structures, Unions and Files.</li> </ol>
<p><b>I Semester</b></p>	<p>V20ENL01 <b>Hone your Communication Skills, Lab-I</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Identify suitable expressions to greet people, say good bye to them, introduce one another, listen to consonants.</li> <li>2. Select suitable words to invite someone, acceptor decline invitations, listen to..., identify and produce vowel sounds.</li> <li>3. Choose suitable expressions to seek/refuse permissions, to apologize and listen to word accent.</li> <li>4. Find apt expressions to give suggestions, express opinions, use appropriate words to give commands and requests.</li> <li>5. Practice listening to dialogues, role-plays using common vocabulary used in dialogues.</li> </ol>
<p><b>I Semester</b></p>	<p>V20AIL02 <b>Statistical Visualization using RLab</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Employ math and simulation in R.</li> <li>2. Demonstrate various types of data structures in R.</li> <li>3. Apply appropriate control structures to solve a particular Programming problem.</li> <li>4. Use R to graphically visualize data and results of statistical calculations.</li> </ol>
<p><b>I Semester</b></p>	<p>V20CSL01 <b>Programming Lab in 'C' for problem Solving</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Demonstrate problem solving techniques.</li> <li>2. Construct Programs using the concepts of Arrays, Strings and Pointers</li> <li>3. Apply the concepts of Functions, Structures and Unions.</li> <li>4. Use various file processing operations to develop real-time applications</li> </ol>
<p><b>II Semester</b></p>	<p>V20MAT10 <b>Integral Transformations and Vector Calculus</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Find the Fourier series of periodic signals</li> <li>2. Find the Fourier transforms of given function</li> <li>3. Find multiple integrals and improper integrals</li> <li>4. Calculate gradient of a scalar function, divergence and curl of a vector function</li> <li>5. Apply the knowledge of vector integral concepts to find characteristics of vector fields</li> </ol>
<p><b>II Semester</b></p>	<p>V20CST02 <b>Python Programming</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Illustrate basic concepts of Python Programming</li> <li>2. Describe control structures in python.</li> <li>3. Construct python programs using structure data types.</li> <li>4. Demonstrate functions and packages .</li> <li>5. Develop programs on Files, Exception handling and OOPs Concepts.</li> </ol>

<p align="center"><b>II Semester</b></p>	<p align="center">V20ECT01 <b>Switching Theory and Logic Design</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Explain the different types of number Systems, number conversions, codes and logic Gates.</li> <li>2. Apply the concepts of Boolean algebra and use the knowledge of K-maps and tabular method for minimization of Boolean expressions..</li> <li>3. Construct the higher order modules from their lower order structures of various M combinational logic circuits.</li> <li>4. Explain the concept of various flip flops.</li> <li>5. Develop various sequential circuits like registers, counters and various Finite State Machine Models</li> </ol>
<p align="center"><b>II Semester</b></p>	<p align="center">V20CST04 <b>Data Structures</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Illustrate the time and space complexities for searching and sorting algorithms.</li> <li>2. Demonstrate linked lists and their applications.</li> <li>3. Demonstrate linear data structure.</li> <li>4. Illustrate basic operations on binary trees.</li> <li>5. Demonstrate Graphs and their applications.</li> </ol>
<p align="center"><b>II Semester</b></p>	<p align="center">V20AIT01 <b>Introduction to Artificial Intelligence</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Discuss the concepts of AI Foundation.</li> <li>2. Illustrate the basics of Machine Learning.</li> <li>3. Explain various Classification Techniques.</li> <li>4. Illustrate the working of Recommendation System.</li> <li>5. Describe the applications of AI and ML.</li> </ol>
<p align="center"><b>II Semester</b></p>	<p align="center">V20CSL02 <b>Python Programming Lab</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Demonstrate Basic Python Programs.</li> <li>2. Construct control structures in python</li> <li>3. Demonstrate functions and packages.</li> <li>4. Construct python programs using structured data types.</li> <li>5. Demonstrate Text Files and exception handling.</li> </ol>
<p align="center"><b>II Semester</b></p>	<p align="center">V20CSL04 <b>Data Structures Lab</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Construct Programs on Sorting and Searching Techniques.</li> <li>2. Illustrate various operations on Linked Lists.</li> <li>3. Develop Programs on Stacks, Queues and their Applications.</li> <li>4. Develop various operations on Trees and Graphs</li> </ol>
<p align="center"><b>II Semester</b></p>	<p align="center">V20ENL02 <b>Hone your Communication Skills Lab-II</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Collect suitable expressions and vocabulary to participate in JAM. Identify root words.</li> <li>2. Prepare, face and perform well in interviews with required etiquette.</li> <li>3. Use appropriate telephone etiquette to succeed in telephonic interviews</li> <li>4. Show team spirit and communicative skills in group discussion.</li> <li>5. Arrange ideas and prepare to give presentations in a professional manner.</li> <li>6. Debate rationally and cogently while putting forth the ideas.</li> </ol>

<b>II Semester</b>	V20CHT02  <b>Environmental Studies</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Recognize the importance of environment and eco system services.</li> <li>2. Identify the characteristic features, uses and impact of over utilization of natural resource</li> <li>3. Explain biodiversity, biodiversity services and conservation of biodiversity</li> <li>4. Report the causes and impacts of various pollutions.</li> <li>5. Illustrate social and global environmental issues; sustainable development practices.</li> </ol>
<b>III Semester</b>	V20MBT51  <b>Managerial Economics and Financial Analysis</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Understand the basic concepts of managerial economics, demand, elasticity of demand and methods of demand forecasting.</li> <li>2. Interpret production concept, least cost combinations and various costs concepts in decision making.</li> <li>3. Differentiate various Markets and Pricing methods along with Business Cycles</li> <li>4. Prepare financial statements and its analysis.</li> <li>5. Assess various investment project proposals with the help of Capital Budgeting techniques for decision making.</li> </ol>
<b>III Semester</b>	V20MAT11  <b>Probability Theory</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Find the statistical parameters of given function.</li> <li>2. Apply probability distribution to real time problems.</li> <li>3. Create good estimators to various parameters</li> <li>4. Apply the principles of Statistical Inference to practical problems on large samples</li> <li>5. Apply the principles of Statistical Inference to practical problems on small samples.</li> </ol>
<b>III Semester</b>	V20MAT07  <b>Mathematical Foundation of Computer Science</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Demonstrate the concepts associated with propositions and mathematical logic.</li> <li>2. Demonstrate the basic concepts associated with relations, functions and their applications.</li> <li>3. Solve recurrence relations using various methods.</li> <li>4. Apply techniques of graphs for real-time problems.</li> <li>5. Construct minimal spanning tree by using different algorithms.</li> </ol>
<b>III Semester</b>	V20AIT02  <b>Advanced Python Programming</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Demonstrate Regular Expressions and Database Connectivity.</li> <li>2. Develop GUI interfaces using widgets.</li> <li>3. Demonstrate statistical analysis using Numpy.</li> <li>4. Demonstrate data analysis using pandas.</li> <li>5. Develop different types of charts using mat plot lib.</li> </ol>
<b>III Semester</b>	V20AIT03  <b>Database Management Systems</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Describe Database systems, various Data model sand Data base architecture.</li> <li>2. Develop various real time applications using Relational algebra and Relational calculus.</li> <li>3. Apply various Normalization technique store fine schema.</li> <li>4. Explain Transaction management and Concurrency control.</li> <li>5. Illustrate various Database indexing techniques.</li> </ol>

<b>IIISemester</b>	V20AIL03  <b>Advanced Python Programming Lab</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Develop Python Programs using regular expressions and Database.</li> <li>2. Develop programs using GUI.</li> <li>3. Construct programs using Numpy Arrays.</li> <li>4. Develop python programs using pandas.</li> <li>5. Develop charts using matplotlib.</li> </ol>
<b>IIISemester</b>	V20AIL04  <b>Linux Shell Scripting Lab</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Demonstrate the basic knowledge of Linux commands and utilities by using Linux shell environment.</li> <li>2. Experiment with the Concept of shell Programming on Files and Directories</li> <li>3. Experiment with the Concept of shell Programming on File Permissions</li> <li>4. Experiment with the Concept of shell Programming on Conditional Statements</li> <li>5. Experiment with the Concept of shell Programming on Looping Statements</li> </ol>
<b>IIISemester</b>	V20AIL05  <b>Data Base Management System Lab</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Construct SQL queries to perform different database operations.</li> <li>2. Experiment with various constraints and Database Indexing Techniques.</li> <li>3. Construct PL/SQL Cursors and Exceptions</li> <li>4. Develop PL/SQL Functions, Procedures and Packages</li> <li>5. Apply basic operations on collections of Mongo DB database</li> </ol>
<b>IIISemester</b>	V20ENT02  <b>Professional Communication Skills-I</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Use vocabulary in regular chores of life with accuracy, make meaningful sentences, and describe people and their traits vividly.</li> <li>2. Distinguish between places of pilgrimage and holiday spots ; describe incidents, things and process; and frame questions, statements and expressions.</li> <li>3. 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 Indian isms with native expressions and avoid common errors.</li> </ol>
<b>IVSemester</b>	V20AIT04  <b>Computer Organization and Architecture</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Illustrate Basic structure of Computers, Instruction types and their addressing modes.</li> <li>2. Describe the different modes of Input / Output transfer.</li> <li>3. Illustrate different types of Memory.</li> <li>4. Describe the different types of Control Unit techniques.</li> <li>5. Explain the Concepts of Pipelining and Parallel Processing</li> </ol>
<b>IVSemester</b>	V20AIT05  <b>Design and Analysis of Algorithms</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Demonstrate a symptom tic notation and divide and conquer technique.</li> <li>2. Use greedy technique to solve various problems.</li> <li>3. Demonstrate dynamic programming technique to various problems.</li> <li>4. Develop algorithms using back tracking technique.</li> <li>5. Demonstrate branch and bound technique to various problems.</li> </ol>

<b>IVSemester</b>	V20AIT06 <b>Java Programming</b>	<b>After Successful completion of the Course, the student will be able to:</b> 1. Describe Java Virtual Machine and Type casting. 2. Demonstrate Concepts like Constructors, Arrays, Nested Classes and Command Line Arguments. 3. Implement Concepts of Inheritance and Exception Handling 4. Develop programs on Multi- Threading and Files 5. Implement Event Handling and Swings.
<b>IVSemester</b>	V20AIT07 <b>Operating Systems</b>	<b>After Successful completion of the Course, the student will be able to:</b> 1. Describe Operating System Services and System Calls. 2. Illustrate Process Management Concepts and CPU Scheduling Algorithms. 3. Demonstrate Process Synchronization primitives and Process Deadlocks. 4. Illustrate Memory Management Techniques and Page Replacement Algorithms. 5. Describe File System Concepts and Mass Storage Structures.
<b>IVSemester</b>	V20AIT08 <b>Artificial Intelligence &amp; its applications</b>	<b>After Successful completion of the Course, the student will be able to:</b> 1. Discuss Problem Solving Agents and Environment. 2. Identify Search Strategies for Non Deterministic and Unknown Environments. 3. Illustrate Adversarial Search for Game Playing. 4. Discuss Reasoning approaches. 5. Illustrate Knowledge Representation approaches.
<b>IVSemester</b>	V20AIL06 <b>Java Programming Lab</b>	<b>After Successful completion of the Course, the student will be able to:</b> 1. Demonstrate Programs on Classes, Objects, Constructors and Arrays. 2. Demonstrate Inheritance and Exception Handling. 3. Implement programs on Multi-Threading and File Handling. 4. Implement Event handling using Swings.
<b>IVSemester</b>	V20AIL07 <b>Operating Systems Lab</b>	<b>After Successful completion of the Course, the student will be able to:</b> 1. Illustrate CPU scheduling algorithms 2. Apply Bankers Algorithm for Deadlock Avoidance and Deadlock Prevent 3. Use Page replacement algorithms for memory management
<b>IVSemester</b>	V20AIL08 <b>Artificial Intelligence Lab</b>	<b>After Successful completion of the Course, the student will be able to:</b> 1. Demonstrate uninformed search techniques. 2. Demonstrate heuristic search techniques. 3. Solve real world problems by searching. 4. Develop AI agent for Gaming and AI-powered chatbot.
<b>IVSemester</b>	V20ENT03 <b>Professional Communication Skills-II</b>	<b>After Successful completion of the Course, the student will be able to:</b> 1. 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. 2. Organize individual words into one whole sentence using new

		<p>vocabulary and focus on the error analysis of prepositions and conjunctions, build conversations which benefit 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.</p> <ol style="list-style-type: none"> <li>3. Recognize the easiest and best possible way of solving problems in the area of Number and Letter Series, Analogy, Classification, Coding &amp; Decoding Symbols, Ranking and Analytical Reasoning.</li> <li>4. Investigate the different types of logics involved in Mirror and Water Images, Logical Reasoning &amp; Arithmetic Reasoning.</li> <li>5. 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.</li> </ol>
<b>VSemester</b>	V20AIT09 <b>Data Engineering</b>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe Data Engineering lifecycle.</li> <li>2. Explain Data architecture and data generation.</li> <li>3. Explain Data Engineering storage abstractions.</li> <li>4. Illustrate Data ingestion process.</li> <li>5. <b>Discuss queries, modeling, transformation and serving.(K2)</b></li> </ol>
<b>VSemester</b>	V20AIT10 <b>Machine Learning</b>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe Machine Learning Activities.</li> <li>2. Explain Feature Transformation and Feature Selection.</li> <li>3. Illustrate Supervised Learning and Unsupervised.</li> <li>4. Explain Semi-Supervised, Ensembling, and Reinforcement Learning.</li> <li>5. Describe Graphical Models and sequential Data Modeling.</li> </ol>
<b>VSemester</b>	V20AIT11 <b>Web Technologies</b>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Illustrate the basic concepts of HTML, CSS and JavaScript.</li> <li>2. Demonstrate an XML Document Structure ,XSLT ,X Path and XML parsers</li> <li>3. Demonstrate working with database using JDBC.</li> <li>4. Build web applications using Servlets &amp;JSP.</li> <li>5. Illustrate the basic concepts of Node JS and Angular JS.</li> </ol>
<b>VSemester</b>	V20AITPE01 <b>Cryptography and Network Security (Professional Elective-I)</b>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Discuss fundamentals and mathematical support of Cryptography and Network Security.</li> <li>2. Discuss symmetric and asymmetric cryptosystems.</li> <li>3. Discuss about HASH functions &amp;Digital Signatures to provide authentication and integrity.</li> <li>4. Demonstrate various methods of Mutual trust and mail security.</li> <li>5. Review the Network&amp; Internet Security Scenarios. .</li> </ol>

V Semester	V20AITPE02 <b>Principles of Programming Languages (Professional Elective-I)</b>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe syntax and semantics of programming languages.</li> <li>2. Explain data types and basic statements of programming languages.</li> <li>3. Design and implement subprogram constructs.</li> <li>4. Discuss concurrency process using OOP.</li> <li>5. Develop programs in Scheme, ML, and Prolog.</li> </ol>
V Semester	V20AITPE03 <b>Hadoop &amp; BigData (Professional Elective-I)</b>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Discuss the challenges of Big Data using Hadoop.</li> <li>2. Apply data modeling techniques to large data sets using map reduce programs.</li> <li>3. Describe the Hadoop I/O classes.</li> <li>4. Examine the use of Pig Framework to work with BigData.</li> <li>5. Develop a data analytical system using HIVE.</li> </ol>
V Semester	V20AITPE04 <b>Automata and Compiler Design (Professional Elective-I)</b>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Construct Finite Automata and Regular Expressions.</li> <li>2. Describe the Compilation Process and Lexical Analysis.</li> <li>3. Construct Topdown and Bottom up Parsing Techniques.</li> <li>4. Produce Intermediate Code Generation and Runtime Environments.</li> <li>5. Explain Code Optimization and Code Generation.</li> </ol>
V Semester	V20AIL09 <b>Machine Learning Lab</b>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Demonstrate advanced python libraries used in Machine Learning.</li> <li>2. Demonstrate feature reduction process.</li> <li>3. Implement probabilistic classifiers using Python Programming.</li> <li>4. Construct non-probabilistic classifiers using Python Programming.</li> <li>5. Demonstrate the process of clustering using the K-Means algorithm.</li> </ol>
V Semester	V20AIL10 <b>Web Technologies Lab</b>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Develop web pages using HTML, CSS and JavaScript.</li> <li>2. Construct an XML document with DTD and XSD.</li> <li>3. Develop Java applications to work with database using JDBC.</li> <li>4. Develop Dynamic web applications using JSP.</li> <li>5. Develop a Simple Node JS and Angular JS application.</li> </ol>



<p style="text-align: center;"><b>V Semester</b></p>	<p style="text-align: center;">V20ENT04 <b>Professional Communication Skills –III</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Distinguish the subtle meanings of various words in different contexts, recognize similar words as well as words with contrast meanings and use them appropriately. Express writer’s tone and relevant ideas using different types of writing skills and prepare resume to show cases kills and accomplishments. Organize thoughts in the discussions and express views without reticence. Develop the ability to write different types of essays in a structured way, maintaining cohesion and logic.</li> <li>2. Identify the central theme and arrange the scrambled sentences into a meaningful passage. Draft emails with appropriate subject lines and relevant content. Compare different pairs of words, recognize the relationship between the head words and the options to siphon correct analogy Choose an appropriate word to make a sentence meaningful. Infer them earning of the picture by thinking out of the box and speak without inhibitions and face interviews with aplomb.</li> <li>3. Analyze appropriate methods of logical thinking on Ratio and Proportion, Partnership, LCM and HCF, Number System, Areas &amp; Volumes.</li> <li>4. Demonstrate problem solving skills through the concepts of Percentages, Profit and loss, Simple Interest &amp; Compound Interest and Allegation.</li> <li>5. Calculate the end results of Cubes, Dice and Data Analysis, Time &amp; Work, Time &amp; Distance, Race &amp; Games.</li> </ol>
<p style="text-align: center;"><b>VI Semester</b></p>	<p style="text-align: center;">V20AIT12 <b>Computer Networks</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Discuss fundamentals of network concepts and Reference Models.</li> <li>2. Discuss Communication media and switching techniques.</li> <li>3. Demonstrate Error control and Data link layer protocols.</li> <li>4. Apply Routing algorithms and congestion control algorithms.</li> <li>5. Discuss Transport layer protocols and Application layer protocols.</li> </ol>
<p style="text-align: center;"><b>VI Semester</b></p>	<p style="text-align: center;">V20AIT13 <b>Object Oriented Software Engineering</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe Software process and different life cycle models.</li> <li>2. Discuss Project Planning, and organization.</li> <li>3. Apply OO concepts along with the inapplicability contexts.</li> <li>4. Demonstrate object oriented analysis and design.</li> <li>5. Describe Implementation, Integration and Maintenance phases.</li> </ol>
<p style="text-align: center;"><b>VI Semester</b></p>	<p style="text-align: center;">V20AIT14 <b>Deep Learning</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe the fundamentals of deep learning.</li> <li>2. Illustrate the working of deep feed forward neural networks.</li> <li>3. Discuss regularization and optimization techniques used in deep neural networks</li> <li>4. Illustrate the working of convolution neural networks.</li> <li>5. Explain about recurrent and recursive neural networks.</li> </ol>

<p style="text-align: center;"><b>VI Semester</b></p>	<p style="text-align: center;">V20AITPE05 <b>Cyber Security (Professional Elective-II)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe about Cybercrimes.</li> <li>2. Explain Cyber criminals and their attacks.</li> <li>3. Illustrate Cybercrimes and security in mobile devices</li> <li>4. Discuss about the Tools and methods used to overcome Cybercrimes.</li> <li>5. Discuss about Cyber Laws, IT Acts and Computer Forensics.</li> </ol>
<p style="text-align: center;"><b>VI Semester</b></p>	<p style="text-align: center;">V20AITPE06 <b>Cloud Computing (Professional Elective-II)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Explain the basic concepts of cloud computing.</li> <li>2. Describe the Virtualization and Migration concepts of Cloud.</li> <li>3. Explain the Cloud Application Design methodologies.</li> <li>4. Illustrate the Security aspects of Cloud.</li> <li>5. Illustrate the SLA Management aspects of Cloud.</li> </ol>
<p style="text-align: center;"><b>VI Semester</b></p>	<p style="text-align: center;">V20AITPE07 <b>Data Science (Professional Elective-II)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Discuss the fundamental concepts of Data Science.</li> <li>2. Illustrate Exploratory Data Analysis.</li> <li>3. Explain the Concepts of Recommendation Engines.</li> <li>4. Explain various Anomaly Detection Techniques.</li> <li>5. Discuss Feature Selection techniques.</li> </ol>
<p style="text-align: center;"><b>VI Semester</b></p>	<p style="text-align: center;">V20AITPE08 <b>Social Networks and Semantic Web (Professional Elective-II)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Demonstrate knowledge by explaining the three different —namedll generations of the web</li> <li>2. Construct a social network.</li> <li>3. Relate knowledge representation methods for semantic web.</li> <li>4. Describe web services and its Applications.</li> <li>5. Develop—Linked Data  Applications using Semantic Web Technologies.</li> </ol>
<p style="text-align: center;"><b>VI Semester</b></p>	<p style="text-align: center;">V20AIL11 <b>Computer Networks Lab</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Implement Error detection technique and Sliding window protocol.</li> <li>2. Implement Routing and congestion control Algorithms.</li> <li>3. Implement socket programming.</li> </ol>
<p style="text-align: center;"><b>VI Semester</b></p>	<p style="text-align: center;">V20AIL12 <b>Object Oriented Software Engineering Lab</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Develop Class diagrams.</li> <li>2. Develop Use case diagrams.</li> <li>3. Construct Interaction diagrams.</li> <li>4. Develop State chart, Activity diagrams.</li> <li>5. Develop Component and Deployment diagrams.</li> </ol>
<p style="text-align: center;"><b>VI Semester</b></p>	<p style="text-align: center;">V20AIL13 <b>DeepLearning Lab</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Demonstrate feed-forward neural network using Tensor flow and Keras.</li> <li>2. Construct a regression model using artificial neural network.</li> <li>3. Construct a classification model using convolutional neural network.</li> <li>4. Construct text classification model using neural network.</li> <li>5. Demonstrate neural network with custom layers and custom training.</li> </ol>

<p style="text-align: center;"><b>VI Semester</b></p>	<p style="text-align: center;">V20CEMC02 <b>Professional Ethics &amp; Human Values</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Discuss the importance of human values and their context.</li> <li>2. Generalize the professional ethics and norms of engineering practice.</li> <li>3. Review the contextual knowledge of engineering as social experimentation.</li> <li>4. Identify the engineer's responsibility for Safety &amp; Risks.</li> <li>5. Clarify the professional rights &amp; responsibilities at global level.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20AITPE09 <b>Ethical Hacking (Professional Elective-III)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Discuss ethical considerations of Hacking.</li> <li>2. Assess an environment using Foot printing and Social Engineering methods.</li> <li>3. Discuss various techniques and tools used in Network Scanning and characteristics in Enumeration phase.</li> <li>4. Demonstrate techniques and tools used in System Hacking and different Malwares.</li> <li>5. Illustrate countermeasures to Denial-Of-Service, Session Hijacking.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20AITPE10 <b>Information Retrieval System (Professional Elective-III)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Identify the basic concepts of Information Retrieval and its System Capabilities.</li> <li>2. Explain the data structures and retrieving documents.</li> <li>3. Describe the difficulty of representing and retrieving documents.</li> <li>4. Explain the latest technologies for describing and searching the web.</li> <li>5. Illustrate searching procedure for user-text and Information System Evaluation.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20AITPE11 <b>Natural Language Processing (Professional Elective-III)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Illustrate Natural Language Processing tasks in syntax, semantics, and pragmatics.</li> <li>2. Classify Morphology and Finite State Transducers, Markov Models and Entropy Models.</li> <li>3. Explain about Statistical parsing and probabilistic CFGs.</li> <li>4. Demonstrate semantic analysis.</li> <li>5. Explain Discourse Analysis and Lexical Resources.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20AITPE12 <b>Software Testing Methodologies (Professional Elective-III)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe Software testing objectives and methodology.</li> <li>2. Apply various Software testing techniques.</li> <li>3. Discuss Static testing techniques for software testing.</li> <li>4. Distinguish Software testing and debugging process.</li> <li>5. Explain modern Software testing tools to Support software testing.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20AITPE13 <b>Distributed Systems (Professional Elective-IV)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe Distributed System Characterization, Time and Global States.</li> <li>2. Discuss the Coordination and Agreement Algorithms.</li> <li>3. Discuss the basic concepts of distributed systems and Characteristics of IPC protocols.</li> <li>4. Explain the mechanisms such as Remote procedure call (RPC/RMI) and OSS.</li> <li>5. Explain the mechanisms such as File Systems and Replications.</li> </ol>

<b>VII Semester</b>	<b>V20AITPE14 NOSQL Databases (Professional Elective-IV)</b>	<b>After Successful completion of the Course, the student will be able to:</b>  <ol style="list-style-type: none"> <li>1. Discuss four types of NoSQL Databases(Document-oriented, Key Value Pairs, Column oriented and Graph).</li> <li>2. Illustrate Replication and sharding.</li> <li>3. Explain NoSQL Key/Value databases using MongoDB.</li> <li>4. Demonstrate Column-oriented NoSQL databases using Apache HBASE.</li> <li>5. Explain Graph NoSQL databases using Neo4.</li> </ol>
<b>VII Semester</b>	<b>V20AITPE15 Computer Vision using Open CV (Professional Elective-IV)</b>	<b>After Successful completion of the Course, the student will be able to:</b>  <ol style="list-style-type: none"> <li>1. Explain digital image acquisition.</li> <li>2. Illustrate histogram generation and analysis for images.</li> <li>3. Apply geometric transformations and detect edges in images.</li> <li>4. Discover features and patterns images.</li> <li>5. Discuss challenges in video processing.</li> </ol>
<b>VII Semester</b>	<b>V20AITPE16 Design Pattern (Professional Elective-IV)</b>	<b>After Successful completion of the Course, the student will be able to:</b>  <ol style="list-style-type: none"> <li>1. Describe the design patterns view and its applications.</li> <li>2. Demonstrate Creational Patterns.</li> <li>3. Construct Structural Patterns for a given Scenario.</li> <li>4. Construct Behavioral Patterns for a given Scenario.</li> <li>5. Examine various Case Studies in utilizing Software Architectures.</li> </ol>
<b>VII Semester</b>	<b>V20AITPE17 Block chain Technologies (Professional Elective-V)</b>	<b>After Successful completion of the Course, the student will be able to:</b>  <ol style="list-style-type: none"> <li>1. Discuss the Cryptographic primitives used in Blockchain.</li> <li>2. Discuss about various technologies borrowed in Blockchain.</li> <li>3. Illustrate various models for Blockchain.</li> <li>4. Discuss about Ethereum.</li> <li>5. Discuss about Hyperledger Fabric.</li> </ol>
<b>VII Semester</b>	<b>V20AITPE18 Scripting Languages (Professional Elective-V)</b>	<b>After Successful completion of the Course, the student will be able to:</b>  <ol style="list-style-type: none"> <li>1. Develop dynamic web pages and validate with java Script.</li> <li>2. Discuss fundamentals of PHP.</li> <li>3. Develop web applications using PHP.</li> <li>4. Demonstrate Perl Programming concepts.</li> <li>5. Illustrate Angular JS framework.</li> </ol>
<b>VII Semester</b>	<b>V20AITPE19  Business Analytics (Professional Elective-V)</b>	<b>After Successful completion of the Course, the student will be able to:</b>  <ol style="list-style-type: none"> <li>1. Describe the application of Data Analytics in Business Intelligence.</li> <li>2. Explain the Business Decision-Making Process.</li> <li>3. Illustrate the strategic value of implementing an enterprise data warehouse.</li> <li>4. Apply Descriptive Analytics for Business Reporting.</li> <li>5. Illustrate Predictive Analytics for Business Problem Solving.</li> </ol>
<b>VII Semester</b>	<b>V20AITPE20  Software Project Management (Professional Elective-V)</b>	<b>After Successful completion of the Course, the student will be able to:</b>  <ol style="list-style-type: none"> <li>1. Describe Software Project Management Terminology.</li> <li>2. Explain various Software development process Models and software Life cycle phases.</li> <li>3. Illustrate various Effort Estimation Techniques and activity network models for Software Project Planning.</li> <li>4. Demonstrate Risk Management Concepts and resource allocation.</li> <li>5. Explain the importance of Project monitoring and control for accomplishing project goals and software Quality.</li> </ol>

<p align="center"><b>VII Semester</b></p>	<p>V20AITJE01</p> <p align="center"><b>Master Coding and Competitive Programming-Part-1 (Job Oriented Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Apply Mathematical reasoning and number theory to solve real world problems in linear time.</li> <li>2. Use of modular arithmetic, to solve complex problems in linear time, logarithmic.</li> <li>3. Use of Prime Factorization and complex solve problems.</li> <li>4. Analyse different techniques including sieve to find prime numbers and evaluate efficiency of these methods.</li> <li>5. Experiment with Hashing and searching techniques to solve problems on Arrays in Linear time.</li> </ol>
<p align="center"><b>VII Semester</b></p>	<p>V20AITJE02</p> <p align="center"><b>Master Coding and Competitive Programming-Part-2 (Job Oriented Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Apply Divide and Conquer algorithm technique to solve complex in logarithmic time.</li> <li>2. Apply Greedy method to solve Optimization and decision making problems.</li> <li>3. Apply Backtracking Algorithm technique to find combinatorial problems.</li> <li>4. Experiment with Dynamic Programming Algorithm technique to solve Problems that uses Optimal substructures.</li> <li>5. Develop programs using LinkedList Graphs, DFS and BFS techniques.</li> </ol>
<p align="center"><b>VII Semester</b></p>	<p>V20AITJE03</p> <p align="center"><b>DevOps (Job Oriented Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Discuss the traditional software development.</li> <li>2. Discuss the concepts of rise of agile methodologies.</li> <li>3. Discuss the concept of DevOps and Agile.</li> <li>4. Demonstrate the purpose of DevOps.</li> <li>5. Illustrate the Operations of CAMS.</li> </ol>
<p align="center"><b>VII Semester</b></p>	<p>V20AITJE04</p> <p align="center"><b>Java Full Stack Technologies (Job Oriented Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Demonstrate IDE to IIS Installation.</li> <li>2. Develop programs using servlets.</li> <li>3. Illustrate MVC architecture.</li> <li>4. Illustrate Spring MVC Framework.</li> <li>5. Demonstrate applications of Hibernate.</li> </ol>
<p align="center"><b>VII Semester</b></p>	<p>V20AITJE05</p> <p align="center"><b>Web Application Development Using Django (Job Oriented Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Demonstrate Django Installation</li> <li>2. Develop programs with Django Basics using database tables.</li> <li>3. Develop Django Form Validations.</li> <li>4. Construct a Blogging Platform.</li> <li>5. Illustrate the concept of File Uploading and Managing Static Files.</li> </ol>
<p align="center"><b>VII Semester</b></p>	<p>V20CEOE01</p> <p align="center"><b>Repair and Rehabilitation of Structures (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Develop various maintenance and repair strategies.</li> <li>2. Evaluate the existing buildings through field investigations.</li> <li>3. Understand and use the different techniques for structural rehabilitation and various techniques of repair.</li> <li>4. Understand the importance of advanced concretes mixes.</li> <li>5. Understand the importance of high performance concretes.</li> </ol>

<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20CEOE02 <b>Ground Improvement Techniques (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Employ the in-situ densification methods at ground surface and at depth.</li> <li>2. Relate the importance of dewatering and different methods of stabilization.</li> <li>3. Illustrate the reinforced earth technology and soil nailing to obviate the problems posed by conventional retaining walls.</li> <li>4. Use the geosynthetics to improve the engineering performance of soils.</li> <li>5. Select different techniques of grouting to solve the ground problems.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20CEOE03 <b>Environmental Pollution and Control (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe the air pollution and its control methods.</li> <li>2. Explain industrial waste water and ways to control it.</li> <li>3. Generalize the solid, hazardous waste and control methods.</li> <li>4. Illustrate the importance of Environmental sanitation methods.</li> <li>5. Illustrate the importance of Sustainable development.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20CEOE04 <b>Building Materials and Construction (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe different building materials and their importance in building construction.</li> <li>2. Relate various components of cement and lime.</li> <li>3. Generalize the brick and stone masonry in construction.</li> <li>4. Interpret different aggregates and their specifications.</li> <li>5. Describe the importance of different building components.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20CEOE05 <b>Remote Sensing and GIS (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Generalize the basic principles of Remote Sensing and GIS, including ground, air and satellite based sensor platforms.</li> <li>2. Interpret the aerial photo graphs and satellite imageries.</li> <li>3. Relate the process of data entry and preparation.</li> <li>4. Examine the Spatial Data for a variety of applications.</li> <li>5. Employ RS and GIS for diverse applications.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20CEOE06 <b>Solid Waste Management (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Generalize Solid Waste and its management.</li> <li>2. Assess different elements for managing Solid Waste.</li> <li>3. Employ different methods for transportation and transformation of solid waste</li> <li>4. Organize different methods for processing and treatment of municipal solid waste.</li> <li>5. Practice suitable disposal methods with respect to solid waste.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20CEOE07 <b>Disaster Management (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe different natural hazards and disaster management.</li> <li>2. Generalize the risk and vulnerability of disaster.</li> <li>3. Illustrate the role of technology in disaster management.</li> <li>4. Relate the importance of education and community preparedness to disaster recovery.</li> <li>5. Organize the multi-section aliases created by disaster.</li> </ol>

<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20CEOE08</p> <p style="text-align: center;"><b>Water Quality and Conservation Systems (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe different parameters of Engineering Hydrology.</li> <li>2. Relate different sources of surface and ground water.</li> <li>3. Assess the importance of water supply systems and quality of water in reference to IS and WHO standards.</li> <li>4. Develop different systems of plumbing.</li> <li>5. Employ different conservation techniques.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20EEOE1</p> <p style="text-align: center;"><b>Non-Conventional Energy Sources (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Understand the concepts of solar radiation data, extra terrestrial radiation, and radiation on earth's surface.</li> <li>2. Understand the operation of various solar thermal Systems.</li> <li>3. Choose suitable maximum power point tracking technique in solar PV and wind application.</li> <li>4. Explain basic principle and working of hydro and tidal power systems</li> <li>5. Explain the basic principle of biomass, fuel cell and geothermal systems</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20EEOE2</p> <p style="text-align: center;"><b>Basics of Control systems (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Construct the transfer function of various mechanical and electrical systems using block diagram algebra and signal flow graphs.</li> <li>2. Find the time response specifications of second order systems and absolute, relative stability of LTI systems using routh's stability criterion and the root locus method.</li> <li>3. Assess the stability of LTI systems using frequency response methods.</li> <li>4. Construct the lag, lead, lag-lead compensators from bode diagrams to improve the system performance.</li> <li>5. Understand the concepts in state space representation of LTI systems, controllability and observability.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20EEOE3</p> <p style="text-align: center;"><b>Principles of Electric Power Conversion (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Understand the basic cooperation of various power electronic devices and converters.</li> <li>2. Apply the suitable power electronic converter for different electrical machines.</li> <li>3. Understand the operation of various renewable energy sources.</li> <li>4. Understand the operation of different energy storage systems and their application</li> <li>5. Choose the suitable heating and welding method for different domestic and industrial applications.</li> </ol>
<p style="text-align: center;"><b>VII Semester</b></p>	<p style="text-align: center;">V20EEOE4</p> <p style="text-align: center;"><b>Programmable Logic Controller and Applications (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Understand the basic concepts of PLCs and their I/O modules.</li> <li>2. Construct the control algorithms to PLC using ladder logic.</li> <li>3. Illustrate the PLC registers for effective utilization in different applications.</li> <li>4. Understand the function of various program control instructions.</li> <li>5. Apply the suitable controller in real time applications.</li> </ol>

<b>VII Semester</b>	V20EEOE5 <b>Energy Storage Systems (Open Elective)</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Classify different energy storages systems.</li> <li>2. Understand the operation of different energy storage systems.</li> <li>3. Illustrate the role of electrical energy storage systems in various aspects.</li> <li>4. Understand the operation of different Electrical Energy Storage (EES) systems.</li> <li>5. Apply suitable EES system to various applications.</li> </ol>
<b>VII Semester</b>	V20EEOE6 <b>Soft Computing Techniques (Open Elective)</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Understand the basic concepts of different oft computing techniques like fuzzy, GA and neural network.</li> <li>2. Understand the fundamental concepts of artificial neural networks.</li> <li>3. Explain the basic concepts&amp; convergence of GA.</li> <li>4. Explain the basic concepts of fuzzy systems and its applications.</li> <li>5. Apply different evolutionary algorithms to various applications.</li> </ol>
<b>VII Semester</b>	V20EEOE7 <b>Electric Vehicles (Open Elective)</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Understand the fundamentals of an electric vehicle.</li> <li>2. Explain the technical characteristics and properties of batteries.</li> <li>3. Estimate the ratings and requirements of electrical machines.</li> <li>4. Illustrate the regenerative braking system of an electric vehicle.</li> <li>5. Estimate the sizing of components of hybrid electric vehicles.</li> </ol>
<b>VII Semester</b>	V20EEOE8 <b>Indian Electricity Act, 2003 (Open Elective)</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Understand the national policy, plan and the joint responsibilities of state and central governments.</li> <li>2. Illustrate the process of licensing and the provisions related to transmission and distribution of electricity.</li> <li>3. Understand the regulatory commissions and Central Electricity Authority (CEA)</li> <li>4. Illustrate the Appellate Tribunal, Reorganization of boards, offences and penalty</li> <li>5. Understand the constitution procedures of special courts and disputer solution.</li> </ol>
<b>VII Semester</b>	V20EEOE9 <b>Power Systems for Data Centers (Open Elective)</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Understand the basics of power in the data centre.</li> <li>2. Illustrate the uninterrupted power supply.</li> <li>3. Illustrate the operation of generators and various power devices.</li> <li>4. Estimate the power required in the data centre.</li> <li>5. Describe the different methods to improve data centre energy efficiency.</li> </ol>
<b>VII Semester</b>	V20EEOE10 <b>Concepts of Power System Engineering (Open Elective)</b>	<b>After Successful completion of the Course, the student will be able to:</b> <ol style="list-style-type: none"> <li>1. Understand the working of the rmalandnu clear power generating stations.</li> <li>2. Estimate the R,L and C parameters of transmission lines(Nominal T and <math>\pi</math> models).</li> <li>3. Find the parameters of DC and AC distribution systems along with voltage drop.</li> <li>4. Understand the operation of fuses and circuit breakers.</li> </ol>



		<p>5. Illustrate the speed/time characteristics of different types of traction motors.</p>
<b>VII Semester</b>	<p>V20EEOE11</p> <p><b>Fundamentals of Smart Grid Technologies (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Understand the basic structure of an electricity marketing condition</li> <li>2. Illustrate the developing technologies in DC distribution and smart grid</li> <li>3. Understand the concepts of dynamic energy systems.</li> <li>4. Illustrate the development of smart domestic system.</li> <li>5. Illustrate the development of intelligent domestic system.</li> </ol>
<b>VII Semester</b>	<p>V20MEOE2</p> <p><b>Green Engineering Systems (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Illustrate the concept of Solar Radiation, Collection, Storage and Applications.</li> <li>2. Discuss the construction and working of wind energy and bio-energy conversion systems.</li> <li>3. Describe the construction and working of Geothermal and Ocean Energy conversion systems.</li> <li>4. Illustrate the principles of environmental impact of current manufacturing practices.</li> <li>5. Discuss the features and benefits of green building materials and its applications.</li> </ol>
<b>VII Semester</b>	<p>V20MEOE3</p> <p><b>Computational Fluid Dynamics (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Apply techniques in the numerical solution of fluid equations.</li> <li>2. Apply numerical modeling and its role in the field of heat transfer and fluid flow.</li> <li>3. Develop methodologies used in CFD.</li> <li>4. Compare various discretization methods and solving methodologies</li> <li>5. Apply skills in the actual implementation of CFD methods (e.g. boundary conditions, different numerical</li> <li>6. Schemes etc., Finite element methods in the application of CFD analysis to real life engineering designs.</li> </ol>
<b>VII Semester</b>	<p>V20MEOE4</p> <p><b>Rapid Prototyping (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Understand virtual prototyping and testing of technology.</li> <li>2. Construct CAD modeling for rapid prototyping.</li> <li>3. Examine different types of process in rapid prototyping.</li> <li>4. Explain Rapid Manufacturing errors.</li> <li>5. Express the applications of rapid prototyping.</li> </ol>
<b>VII Semester</b>	<p>V20MEOE5</p> <p><b>Computer Aided Design (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Explain the basic fundamentals of CAD tools.</li> <li>2. Find the characteristics of curves, Representation and continuity requirements.</li> <li>3. Illustrate the Geometric Transformations and demonstrate various types of surfaces and Representation.</li> <li>4. Differentiate between the methods of representing Solid Modeling.</li> <li>5. Apply the local and global properties for product development.</li> </ol>

<p align="center"><b>VII Semester</b></p>	<p align="center">V20MEOE6 <b>Mechatronics (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Understand the elements of Mechatronics &amp; levels and explain various types of sensors, transducers and Mechatronics design process.</li> <li>2. Sketch and explain various types of solid state devices like Diode, BJT, MOSFET, etc.</li> <li>3. Illustrate and explain basic principles of Hydraulic, pneumatic, electro hydraulic, electro hydraulic servo actuating systems.</li> <li>4. Illustrate and explain micro processors, microcontrollers and PLC</li> <li>5. Sketch and explain System interfacing and data acquisition systems.</li> </ol>
<p align="center"><b>VII Semester</b></p>	<p align="center">V20ECTOEO1 <b>Internet of Things (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe M2 M and IOT Technologies.</li> <li>2. Identify the layers and protocols in IOT.</li> <li>3. Describe various communication technologies used in IOT.</li> <li>4. Demonstrate various hardware components required for IOT applications.</li> <li>5. Identify the cloud technologies &amp; explain the applications of IoT.</li> </ol>
<p align="center"><b>VII Semester</b></p>	<p align="center">V20ECTOEO2 <b>Communication Systems (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Demonstrate the fundamentals of communication systems.</li> <li>2. Compare the various analog modulation and demodulation schemes.</li> <li>3. Compare the various digital modulation and demodulation schemes.</li> <li>4. Explain the wireless communication system concepts.</li> <li>5. Outline the satellite &amp; Optical communication system principles.</li> </ol>
<p align="center"><b>VII Semester</b></p>	<p align="center">V20ECTOEO3 <b>Principles of Image Processing (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Understand the different Transforms Techniques &amp; their use in Image Processing Applications</li> <li>2. Describe Spatial and frequency domain filtering like smoothing and sharpening operations on Images.</li> <li>3. Describe Restoration operations/techniques on Images.</li> <li>4. Describe the Image compression Techniques and Image segmentation.</li> <li>5. Explain the different color Image Processing Techniques.</li> </ol>
<p align="center"><b>VII Semester</b></p>	<p align="center">V20ECTOEO4 <b>Medical Electronics (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Explain the basics concepts of Bio-Medical Instrumentation.</li> <li>2. Explain the concepts of electrode theory, classification of Electrodes and Transducers used in Bio- Medical Applications.</li> <li>3. Explain the Anatomy and Physiology of Cardio vascular system and Illustrate the application of Bio- Medical Instruments to measure the Physiological parameters of Cardiovascular System.</li> <li>4. Discuss the elements used for Patient's Health care &amp; monitoring.</li> <li>5. Classify different types of monitors, discuss the principals of recorders and Illustrate the methods of accident preventions.</li> </ol>
<p align="center"><b>VII Semester</b></p>	<p align="center">V20ECTOEO5 <b>Principles of Wireless Communications (Open Elective)</b></p>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Discuss the cellular system evolution of mobile radio systems.</li> <li>2. Illustrate the basic cellular concepts.</li> <li>3. Explain the Various Propagation models.</li> <li>4. Discuss the need of modulation, diversity and equalization in cellular &amp; Mobile Communication.</li> <li>5. Demonstrate the knowledge about GSM architecture &amp; upcoming</li> </ol>

		technologies like 3G,4G etc.
<b>VII Semester</b>	<b>V20ECTOE06</b> <b>Basics of VLSI Design (Open Elective)</b>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Identify the CMOS layout levels, and the design layers used in the process sequence.</li> <li>2. Describe the general steps required for processing of CMOS integrated circuits.</li> <li>3. Outline static CMOS combinational and sequential logic at the transistor level.</li> <li>4. Demonstrate different logic styles such as complementary CMOS logic, pass-Transistor Logic, dynamic logic, etc.</li> <li>5. Interpret the need for testability and testing methods in VLSI.</li> </ol>
<b>VII Semester</b>	<b>V20ECTOE07</b> <b>Concepts Of Embedded Systems (Open Elective)</b>	<p><b>After Successful completion of the Course, the student will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Describe the Basic Concepts of embedded systems.</li> <li>2. Describe the characteristics of Application &amp; Domain-Specific Embedded System</li> <li>3. Explain the various elements of embedded hardware and their design principles.</li> <li>4. Explain various software design approaches in embedded environment.</li> <li>5. Discuss various tools used for Embedded system implementation and testing.</li> </ol>