**VAAGDEVI COLLEGE OF ENGINEERING**

**(AUTONOMOUS)**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**COURSE OUTCOMES FOR B.TECH-EEE R22**

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| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **I Year I Sem**  | **Matrices and Calculus** | **B22MA01** | **L/T/P :3/1 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations |
| 2 | Find the Eigen values and Eigen vectors |
| 3 | Reduce the quadratic form to canonical form using orthogonal transformations. |
| 4 | Solve the applications on the mean value theorems. |
| 5 | Evaluate the improper integrals using Beta and Gamma functions |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **I Year I Sem**  | **Engineering Chemistry** | **B22CH01** | **L/T/P :3/1 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Students will acquire the basic knowledge of electrochemical procedures related to corrosion and its control. |
| 2 | The students are able to understand the basic properties of water and its usage in domestic and industrial purposes. |
| 3 | They can learn the fundamentals and general properties of polymers and other engineering materials. |
| 4 | They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **I Year I Sem**  | **C Programming and Data Structures** | **B22CS01** | **L/T/P :3/0 /0** |
| By the end of the course, students will be able to |
| 1 | Understand the various steps in Program development |
| 2 | Explore the concepts of control statements and functions in C Programming Language. |
| 3 | Understand the concepts of pointers and its applications |
| 4 | Ability to design and implement different types of file structures |
| 5 | Apply data structures such as stacks, queues in problem solving and analyze various |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **I Year I Sem**  | **Electrical Circuit Analysis–I** | **B22EE01** | **L/T/P :3/0 /0** |
| The basic concepts included in this course will help the student to: |
| 1 | Understand the basics of electrical circuits such as laws, transformation and network reduction techniques. |
| 2 | Explore the basic principles and concepts involved in AC circuits and analyze power in series and parallel AC circuits |
| 3 | Apply network theorems to analyze electrical circuits |
| 4 |  Analyze balanced and unbalanced three phase circuits and measure voltage, current and power in three phase star and delta connections |
| 5 | Explore various network topologies and analyze the networks with cut-set and tie-set |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **I Year I Sem**  | **Computer Aided Engineering Graphics** | **B22ME03** | **L/T/P :1/0 /4** |
| After learning the contents of this subject, the student must be able to |
| 1 | Apply computer aided drafting tools to create 2D and 3D objects sketch Conics and different types of solids |
| 2 | Appreciate the need of Sectional views of solids and Development of Surfaces of solids |
| 3 | Read and interpret engineering drawings |
| 4 |  Conversion of orthographic projection into isometric view and vice Versa manually and by using computer aided drafting |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **I Year I Sem**  | **Elements of Electrical and Electronics Engineering** | **B22EE02** | **L/T/P :0/0 /2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Verify the basic electrical circuits through different laws and theorems |
| 2 | Measure voltage, current and power of a single phase transformer |
| 3 | Calculate the impedance of series RL, RC and RLC circuits |
| 4 | Determine the form factor of a non-sinusoidal waveform |
| 5 | Analyse the transient responses of R, L and C circuits for DC excitation |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **I Year I Sem**  | **Engineering Chemistry Laboratory** | **B22CH02** | **L/T/P :0/0 /2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Able to determine the hardness of water |
| 2 | Able to perform methods such as conductometry, and potentiometry in order to find out the concentrations or equivalence points of acid, and PH of unknown solutions.. |
| 3 | Students are able to prepare polymers like bakelite and nylon-6,6. |
| 4 |  Estimations saponification value, and viscosity of lubricant oils |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **I Year I Sem**  | **C Programming and Data Structures Laboratory** | **B22CS07** | **L/T/P : 0/0 /2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Develop modular and readable C Programs |
| 2 | Solve problems using strings, functions. Handledatain files. |
| 3 |  Implement stacks, queues using arrays. |
| 4 | To understand and analyze various searching and sorting algorithms. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **I Year II Sem**  | **Ordinary Differential Equations and Vector Calculus** | **B22MA02** | **L/T/P :3/1 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Identify whether the given differential equation of first order is exact or not |
| 2 | Solve higher differential equation and apply the concept of differential equation to real world problems. |
| 3 | Extend the basic concepts of differential calculus to vector functions in a simple and natural fashion. |
| 4 | Extend the basic concepts of differential calculus to vector functions in a simple and natural fashion. |
| 5 | Evaluate the line, surface and volume integrals and converting them from one to another |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits:4** |
| **I Year II Sem**  | **Applied Physics** | **B22PH01** | **L/T/P : 3/1 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand physical world from fundamental point of view by the concepts of Quantum |
| 2 |  Mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids. |
| 3 | Identify the role of semiconductor devices in science and engineering Applications. |
| 4 | Explore the fundamental properties of dielectric, magnetic materials and energy for their applications. |
| 5 |  Appreciate the features and applications of Nanomaterials. |
| 6 | Understand various aspects of Lasers and Optical fiber and their applications in diverse fields. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 2.5** |
| **I Year II Sem**  | **Engineering Workshop** | **B22ME01** | **L/T/P :0/1 /3** |
| After learning the contents of this subject, the student must be able to |
| 1 | Study and practice on machine tools and their operations |
| 2 | Practice on manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding |
| 3 | Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling |
| 4 | Apply basic electrical engineering knowledge for house wiring practice |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits:2** |
| **I Year II Sem**  | **English for Skill Enhancement** | **B22EN01** | **L/T/P :2/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the importance of vocabulary and sentence structures. |
| 2 |  Choose appropriate vocabulary and sentence structures for their oral and written communication. |
| 3 |  Demonstrate their understanding of the rules of functional grammar. |
| 4 |  Develop comprehension skills using known and unknown passages. |
| 5 |  Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 2** |
| **I Year II Sem**  | **Electrical Circuit Analysis- II** | **B22EE05** | **L/T/P :2/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Evaluate the network parameters in two port network |
| 2 | Design the different kinds of two port network filters. |
| 3 |  Study the transient response of series and parallel RLC circuits for DC and sinusoidal excitations |
| 4 |  Analyze the response of an electrical circuit for step, ramp, impulse etc., using Laplace transformation |
| 5 |  Learn the Fourier series and integral to analyze the AC circuits |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1.5** |
| **I Year II Sem**  | **Applied Physics Laboratory** | **B22PH02** | **L/T/P :0/0 /3** |
| After learning the contents of this subject, the student must be able to |
| 1 | Know the determination of the Planck’s constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment. |
| 2 |  Appreciate quantum physics in semiconductor devices and optoelectronics. |
| 3 | Gain the knowledge of applications of dielectric constant. |
| 4 | Understand the variation of magnetic field and behavior of hysteresis curve. |
| 5 | Gain the knowledge of decay of charge and determine time constant of RC circuit |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **I Year II Sem**  | **English Language and Communication Skills Laboratory** | **B22EN02** | **L/T/P :0/0 /2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the nuances of English language through audio- visual experience and group activities |
| 2 | Neutralize their accent for intelligibility |
| 3 | Develop their listening skills so that they may appreciate its role in developing LSRW skills of language and improve their pronunciation. |
| 4 |  Involve in speaking activities in various contexts. |
| 5 | Speak with clarity and confidence which in turn enhance their employability skills |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 2** |
| **I Year II Sem**  | **Applied Python Programming Laboratory** | **B22CS10** | **L/T/P :0/1 /2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Install Python in linux and windows, Installing O Son Raspberry Pi |
| 2 | Build basic programs using fundamental programming constructs |
| 3 |  Write and execute python codes for different applications |
| 4 |  Capable to implement to n hard ware boards |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **I Year II Sem**  | **Electrical Circuit Analysis Laboratory** | **B22EE06** | **L/T/P :0 /0/2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Draw locus diagrams for series RLC circuit |
| 2 | Create resonance condition in R-L-C series and parallel circuit and learn how to draw phasor diagram for the circuit. |
| 3 | Determine Z, Y and ABCD parameters for a given two port network |
| 4 | Analyze filters in frequency domain |
| 5 |  Measurement of Active Power and Reactive Power for Star and Delta connected balanced loads |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **II Year I Sem**  | **Numerical Methods and Complex variables** | **B22MA07** | **L/T/P :3/1 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Express any periodic function in terms of sine and cosine |
| 2 |  Find the root of a given polynomial and transcendental equations. Estimate the value for the given data using interpolation |
| 3 |  Find the numerical solutions for a given first order ODE’s |
| 4 | Analyze the complex function with reference to their analyticity, integration using Cauchy’s integral and residue theorems |
| 5 |  Taylor’s and Laurent’s series expansions in complex function |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **II Year I Sem**  | **Electrical Machines-I** | **B22EE07** | **L/T/P : 3/1 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Identify different parts of a DC machines & understand their operation. with various excitation |
| 2 | Learn various methods of starting, speed control of dc motors |
| 3 | Analyze the performance of DC machines with various methods of testing. |
| 4 | Understand the construction, operation and performance of single phase transformer |
| 5 |  Learn the methods of testing of single phase transformers and explore the polyphase connections of transformer. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **II Year I Sem**  | **Analog Electronic Circuits** | **B22EC10** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Know the characteristics, utilization of various components. |
| 2 | Understand the biasing techniques |
| 3 | Design and analyze various rectifiers, small signal amplifier circuits. |
| 4 | Design sinusoidal and non-sinusoidal oscillators. |
| 5 | Designs OP-AMP based circuits with linear integrated circuits. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **II Year I Sem**  | **Power Systems-I** | **B22EE08** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the operation of conventional and renewable electrical power generating stations. |
| 2 | Evaluate the power tariff methods and Economics associated with power generation. |
| 3 | Modelling of various parameters of transmission lines and classification of overhead line insulators and evaluation of string efficiency.  |
| 4 | Analyze the operations of AIS and GIS |
| 5 | Compare and evaluate various distribution systems |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **II Year I Sem**  | **Electro Magnetic Fields** | **B22EE09** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the basic laws of electromagnetism and their applications. |
| 2 | Understand the behavior of conductors and dielectrics, their boundary conditions, Maxwell’s equations with respect to electrostatics |
| 3 | Analyze the relation between the electric field and magnetic field |
| 4 |  Analyze time varying electric and magnetic fields. |
| 5 | Understand the propagation of EM waves |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **II Year I Sem**  | **Electrical Machines Laboratory-I** | **B22EE10** | **L/T/P :0 /0/2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Start and control the Different DC Machines. |
| 2 | Assess the performance of different machines using different testing methods |
| 3 | Evaluate the performance of different Transformers using different testing methods |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **II Year I Sem**  | **Analog Electronic Circuits Laboratory** | **B22EC11** | **L/T/P : 0 /0/2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Know the characteristics, utilization of various components. |
| 2 | Understand the biasing techniques |
| 3 | Design and analyze various rectifiers, small signal amplifier circuits. |
| 4 | Design sinusoidal and non-sinusoidal oscillators. |
| 5 | Design OP-AMP based circuits with linear integrated circuits. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **II Year I Sem**  | **Electrical Simulation tools Laboratory** | **B22EE11** | **L/T/P : 0 /0/2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Develop knowledge of software packages to model and program electrical and electronics systems. |
| 2 | Model different electrical and electronic systems and analyze the results. |
| 3 | Articulate importance of software packages used for simulation in laboratory experimentation by analyzing the simulation results. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 0** |
| **II Year I Sem**  | **Gender Sensitization Laboratory** | **B22MC07** | **L/T/P :0 /0/2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Students will have developed a better understanding of important issues related to gender in contemporary India. |
| 2 | Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and films. |
| 3 | Students will attain a finer grasp of how gender discrimination works in our society and how to counter them. Students will acquire insights into the gendered division of labour and its relation to politics and economics. |
| 4 | Students will develop a sense of appreciation of women in all walks of life. Men and women students and professionals will be better equipped to work and live in harmony |
| 5 | Through providing accounts of studies and movements as well as the new laws thatprovide protection and relief to women, the textbook will empower students to understand and respond to gender violence. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **II Year II Sem**  | **Solid Mechanics & Hydraulic Machines** | **B22ME20** | **L/T/P :3/1 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Solve problems dealing with forces, beam and cable problems and understand distributed force systems. |
| 2 | Solve friction problems and determine moments of Inertia and centroid of practical shapes. |
| 3 | Apply knowledge of mechanics in addressing problems in hydraulic machinery and its principles that will be utilized in Hydropower development and for other practical usages. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **II Year II Sem**  | **Measurements and Instrumentation** | **B22EE13** | **L/T/P :3/0/0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand different types of measuring instruments, their construction operation and characteristics |
| 2 | Identify the instruments suitable for typical measurements. |
| 3 | Analyze the measurement of voltage, current, Power factor, power, energy, R, L,C and magnetic measurements. |
| 4 | Apply the knowledge about transducers and instrument transformers to use them effectively. |
| 5 | Apply the knowledge of smart and digital metering for industrial applications. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **II Year II Sem**  | **Electrical Machines–II** | **B22EE14** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the concepts of rotating magnetic fields, operation of ac machines. |
| 2 | Learn the various methods of testing, speed control of induction motors |
| 3 | Understand the construction of synchronous machines, analyze performance characteristics of synchronous generators. |
| 4 | Explore the parallel operation, analyze the performance of synchronous motor. |
| 5 | Analyze\ study the various single-phase induction motors |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 2** |
| **II Year II Sem**  | **Digital Electronics** | **B22EC22** | **L/T/P :2/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the working of logic families and logic gates. |
| 2 | Design logic circuits by applying various minimization technique to combinational function |
| 3 | Design and implement Combinational and Sequential logic circuits. |
| 4 | Design and implementation various `sequential circuits |
| 5 | Implement the given logical problems using programmable logic devices. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **II Year II Sem**  | **Power System-II** | **B22EE15** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Design of transmission lines and investigate the concepts of corona and its effects |
| 2 | Apply load compensation techniques to control reactive power |
| 3 | Acquire and apply the knowledge of per unit quantities in power systems. |
| 4 | Investigate the concepts of over voltage protection, insulation coordination lighting surges and switching surges |
| 5 | Determine the fault currents for symmetrical and unbalanced faults |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **II Year II Sem**  | **Digital Electronics Laboratory** | **B22EC23** | **L/T/P :0/0/2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the working of logic families and logic gates. |
| 2 | Design and implement Combinational and Sequential logic circuits. |
| 3 |  Analyze different types of semiconductor memories. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **II Year II Sem**  | **Measurements and Instrumentation Laboratory** | **B22EE16** | **L/T/P :0 /0/2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Choose and test any measuring instruments. |
| 2 |  Find the accuracy of any instrument by performing experiments. |
| 3 | Calculate the various parameters using different types of measuring instruments |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **II Year II Sem**  | **Electrical Machines Laboratory-II** | **B22EE17** | **L/T/P :0 /0/2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Assess the performance of different types of AC machines using different testing methods. |
| 2 | Analyze the suitability of AC machines and Transformers for real word applications. |
| 3 | Design the machine models based on the application requirements. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 0** |
| **II Year II Sem**  | **Logical Reasoning & Quantitative Aptitude** | **B22MC08** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 |  Improve their logical thinking in terms of general and mathematical concepts. |
| 2 | Compete in academic as well as competitive levels through which students are able to solve the real world problems. |
| 3 |  Analyze the number systems |
| 4 | Make quick decisions to face the critical arithmetic problems. |
| 5 | Analyze the mathematical problems.  |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **III Year I Sem**  | **Power Electronics** | **B22EE21** | **L/T/P :3/1 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the differences between signal level and power level devices. |
| 2 |  Analyze controlled rectifier circuits. |
| 3 |  Analyze the operation of DC-DC choppers |
| 4 |  Analyze the voltage source inverters. |
| 5 |  Describe the behavior and applications of AC-AC converters. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **III Year I Sem**  | **Control Systems** | **B22EE22** | **L/T/P : 3/0/0**  |
| After learning the contents of this subject, the student must be able to |
| 1 | Find the transfer function and state-space representation of linear time-invariant dynamical systems. |
| 2 | Estimate the time domain specifications, steady state error and Analyze the performance and  |
| 3 |  Stability of linear time-invariant systems in the time domain. |
| 4 |  Analyze the performance and stability of linear time-invariant systems in frequency domain. |
| 5 | Design classical controllers/compensators to improve the performance and stability of linear  |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **III Year I Sem**  | **Signals and Systems** | **B22EC06** | **L/T/P : 3/1 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Apply the knowledge of various signals, and systems. |
| 2 | Analyze the transform techniques in time and frequency domain. |
| 3 | Identify the conditions for transmission of signals through systems and conditions for physical realization of systems. |
| 4 |  Analyze the concept of Region of Convergence for different Transformation techniques.  |
| 5 | Use sampling theorem for baseband and band pass signals for various types of sampling and apply the correlation and PSD functions for various applications |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **III Year I Sem**  | **Renewable Energy Systems** | **B22EE23** | **L/T/P : 3/1 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the principles of wind power and solar photovoltaic power generation |
| 2 | Understand the working principle of fuel cells and different types of fuel cells  |
| 3 | Assess the cost of generation for conventional and renewable energy plants |
| 4 |  Design suitable power controller for wind and solar applications  |
| 5 |  Analyze the issues involved in the integration of renewable energy sources to the grid |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **III Year I Sem**  | **High Voltage Engineering** | **B22EE24** | **L/T/P : 3/1 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the various breakdown processes in solid, liquid and gaseous insulating materials. |
| 2 | Explain the generation of high D. C., A.C., & Impulse voltage |
| 3 | Apply the suitable method to measure high D. C., A.C., & Impulse voltages. |
| 4 |  Elaborate the lightning and switching over-voltage and protection against these over- voltages. |
| 5 |  Discuss about high voltage testing of electrical apparatus and high voltage laboratories. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **III Year I Sem**  | **Computer Aided Electrical Machine Designs** | B22EE25 | L/T/P : 3/0/0 |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the concepts electrical, magnetic and thermal loading of electrical machines |
| 2 | Understand the design and operating characteristics of Transformers. |
| 3 |  To analyze the varies factors in the design and operating characteristics of induction motors |
| 4 | To analyze the varies factors in the design of synchronous motors. |
| 5 | To understand the use of software tools in the design of electrical machines |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **III Year I Sem**  | Electrical Engineering Materials | B22EE26 | L/T/P : 3/0 /0 |
| After learning the contents of this subject, the student must be able to |
| 1 | Impart the knowledge on electrical engineering materials classification and their applications. |
| 2 | Study the performance characteristics of various semiconducting, dielectric and insulation materials and their applications in design of electrical and electronic devices |
| 3 | Identify various magnetic materials and their classification. |
| 4 | Learn various special purpose of materials. |
| 5 |  Design various electronic components. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **III Year I Sem**  | **Power Electronics Laboratory** | **B22MB01** | **L/T/P :3/0/0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Study Characteristics of various Power Semiconductor devices. |
| 2 | Analyze AC/AC and AC/DC Converters. |
| 3 |  Analyze the behavior of various DC/DC and DC/AC converters. |
| 4 |  Know the Simulation tools for analysing power electronics converters |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **III Year I Sem**  | **Control Systems Laboratory** | **B22EE28** | **L/T/P :4/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Analyze the time & Frequency response of control systems |
| 2 |  Identify the Performance of servo motor and synchros |
| 3 | Evaluate the performance of feedback control systems |
| 4 | Analyze the Stability of Linear Time Invariant systems |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 0** |
| **III Year I Sem**  | **Intellectual Property Rights** | **B22MB06** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Distinguish and explain various forms of IPRs. |
| 2 | Identify criteria to fit one's own intellectual work in particular form of IPRs. |
| 3 |  Apply statutory provisions to protect particular form of IPRs. |
| 4 | Appraise new developments in IPR laws at national and international level |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **III Year II Sem**  | **Flexible AC Transmission Systems** | **B22EE29** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand various power electronics based FACTS devices for the control of active and reactive Power in the system |
| 2 |  Compare current source converters with voltage source converters  |
| 3 | Classify the FACTS devices into Thyristor based and Converter based and Understanding the dynamics of stability of voltage regulation using Shunt compensation. |
| 4 |  Understand the SVC and STATCOM |
| 5 | Analyse Transient Stability Enhancement, Power Oscillation Damping, Transient Stability Margin Using series compensation |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **III Year II Sem**  | **Power Semiconductor Drives** | **B22EE30** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Identify the drawbacks of speed control of the motor by conventional methods. |
| 2 | Differentiate Phase controlled and chopper-controlled DC drives speed-torque characteristics merits and demerits |
| 3 | Understand AC motor drive speed–torque and performance characteristics using different control strategies, its merits and demerits. |
| 4 |  Describe the Slip power recovery schemes |
| 5 |  Analyze the speed control schemes for synchronous motor drives  |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **III Year II Sem**  | **Digital Signal Processing** | **B22EC30** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Outline the properties of systems and signals |
| 2 |  Identify the various important characteristics of different transform techniques used in digital signal processing. |
| 3 |  Design IIR filters based on the specifications given  |
| 4 | Design FIR filters for given specifications |
| 5 | Demonstrate different realizations of digital filters |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **III Year II Sem**  | **Advanced Control Systems** | **B22EE31** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand different non linearity’s and their describing functions. |
| 2 | Describe the methods of Phase-plane trajectory of nonlinear control systems.  |
| 3 |  Apply various theorems for stability analysis of linear and nonlinear systems.  |
| 4 | Implement modal control and calculus of variations. |
| 5 | Formulate and solve optimal control problems |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **III Year II Sem**  | **Microprocessors & Microcontrollers** | **B22EC36** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the internal architecture and organization of 8086. |
| 2 | Understand the interfacing techniques to 8086 and 8051. |
| 3 | Understand the communication standards and interfacing with microcontroller. |
| 4 |  Understand the internal architecture of 8051 microcontroller. |
| 5 | Develop assembly language programming to design microprocessor/ micro controller- |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **III Year II Sem**  | **Power System Protection** | **B22EE32** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Ability to comprehend the fundamental requirements for power system protection, the consequences  of faults, and the workings of a basic relay |
| 2 | Be able to sketch performance characteristics and prevent faults with distance relays and over-current protective schemes  |
| 3 | Capable of implementing bus zone protection, AC machines, and pilot relay schemes. |
| 4 | Competent in controlling both microprocessors and static relays for transmission systems. |
| 5 |  Possessing knowledge of the quenching processes utilized in vacuum, oil, and air circuit breakers |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **III Year II Sem**  | **Power System Operation and Control** | **B22EE33** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Calculate various parameters at different buses using load flow studies. |
| 2 | Analyse economic operation of the power system. |
| 3 | Analyse load frequency control of Single area and Two area power systems. |
| 4 |  Understand the Stability of the power system and Apply different techniques to maintain the stability of power system |
| 5 | Interpret the factors involved in load dispatch  |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **III Year II Sem**  | **Power System Laboratory** | **B22EE34** | **L/T/P :0 /0/2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Capable of understanding the basic transmission line parameters and protection schemes. |
| 2 | Be able to find the different relay characteristics for the transmission system. |
| 3 | Capable of understanding the effects of faults in power systems. |
| 4 |  Capable of simulating the YBUS and ZBUS and performing the load flow analysis |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **III Year II Sem**  | **Microprocessors & Microcontrollers Laboratory** | **B22EC37** | **L/T/P :0 /0/2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understands the internal architecture and organization of 8086, 8051 and ARM processors/controllers. |
| 2 | Understands the interfacing techniques of 8086 and 8051. |
| 3 | Develop assembly language programming to design microprocessor/ micro controller-based systems. |
| 4 | Develop programs for interfacing various external devices. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 1** |
| **III Year II Sem**  | **Electronics Design Laboratory** | **B22EE35** | **L/T/P :0/0/2** |
| After learning the contents of this subject, the student must be able to |
| 1 | Design the various regulated power supplies for control boards.  |
| 2 | Gain knowledge on designing various triggering circuits for semiconductor devices.  |
| 3 |  Develop timer circuits for power switching devices |
| 4 |  Develop PWM control and gate driver circuits for various power electronic converter applications.  |
| 5 | Develop the zero-crossing detector |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 2** |
| **III Year II Sem**  | **Industry Oriented Mini Project/Internship** | **B22EE36** | **L/T/P :0 /0/4** |
| After learning the contents of this subject, the student must be able to |
| 1 | Students will be able to practice acquired knowledge within the chosen area of technology for project development |
| 2 | Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach. |
| 3 | Reproduce, improve and refine technical aspects for engineering projects |
| 4 | Work as an individual or in a team in development of technical projects & Communicate and report effectively project related activities and findings. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **IV Year I Sem**  | **Power Electronic Applications to Renewable Energy Systems** | **B22EE37** | **L/T/P :3/1 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Proficiently demonstrate various renewable energy technologies utilized for electrical power generation. |
| 2 |  Identify suitable converters (AC-DC, DC-DC, AC-AC) for renewable energy systems. |
| 3 |  Analyze the operating principles of different types of wind generators  |
| 4 | Model and control of a PMSM, Doubly fed Induction Generator, WECS |
| 5 | Interpret and analyze various wind and photovoltaic (PV) systems, including stand-alone, grid- connected, and hybrid configurations. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 4** |
| **IV Year I Sem**  | **Advanced Power Electronics** | **B22EE38** | **L/T/P :3/0/0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Classify driver circuits for various power semiconductor devices. |
| 2 |  Analyze the operation of multi-pulse converters.  |
| 3 | Understand the operation of resonant converters.  |
| 4 | Know the differences between VSI and CSI. |
| 5 | Gain knowledge on the operation of multilevel inverters |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year I Sem**  | **HVDC Transmission** | **B22EE39** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Compare EHV AC and HVDC systems and to describe various types of DC links |
| 2 | Analyze various control methodologies and characteristics of converters.  |
| 3 | Perform power flow analysis in ac/dc systems |
| 4 | Study and understand the nature of faults happening on both the AC and DC sides of the converters and Formulate protection schemes for the same. |
| 5 | Design the harmonics reduction filters for HVDC transmission |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year I Sem**  | **Electric and Hybrid Vehicles** | **B22EE40** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the models to describe hybrid vehicles and their performance. |
| 2 |  Understand the social and environmental importance of electric and hybrid vehicles. |
| 3 |  Understand the various configurations of Electric Drive Trains. |
| 4 | Understand the different strategies related to energy storage systems. |
| 5 | Understand the different strategies of energy management systems and case studies. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year I Sem**  | **Utilization of Electrical Energy** | **B22EE41** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand basic principles of electric heating  |
| 2 | Understand basic principles of electric welding |
| 3 | Determine the lighting requirements for flood lighting, household and industrial needs. |
| 4 | Calculate heat developed in induction furnace and evaluate speed time curves for traction |
| 5 | Analyze the coach wiring |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year I Sem**  | **Advanced Electrical Drives** | **B22EE42** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Analyse the operation of three phase converter fed dc motors. |
| 2 | Describe the VSI and CSI fed induction motor operation. |
| 3 |  Know the concept of vector control of induction motor drive. |
| 4 |  Understand the concept of direct torque control for three phase induction motor. |
| 5 |  Gain knowledge on vector control of PMSM drives and introduction to BLDC drives |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year I Sem**  | **Soft Computing Techniques** | **B22EE43** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | To know basic idea of modern engineering techniques which are useful for solving non-linear and complex functions that may come across dissertation/research work |
| 2 | To understand optimization problem |
| 3 |  Understand the concept of multi-objective optimization problems (MOOPs) and issues of solving it. |
| 4 | Knowing Adaptive Neuro-Fuzzy Inference Systems |
| 5 | Evaluate and compare solutions by soft computing techniques for a given problem in matlab Simulink |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year I Sem**  | **VLSI Design** | **B22EC60** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand IC technology and basic electrical properties of MOS and BiCMOS. |
| 2 | Design the layout circuits using various design rules. |
| 3 |  Develop and design the gate level circuits |
| 4 | Gain the knowledge to design data path subsystems like Adders, Shifters, ALUs etc. |
| 5 |  Illustrate different programmable logic devices and CMOS testing. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year I Sem**  | **IOT Applications in Electrical Engineering** | **B22EE44** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Select suitable sensors for electrical engineering applications. |
| 2 | Understand about usage of various types of motionless sensors and motion detectors. |
| 3 | Utilize MEMS in developing electrical engineering applications. |
| 4 | Apply IoT in a smart grid. |
| 5 |  Discuss the future working environment with Energy internet. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 2** |
| **IV Year I Sem**  | **Management And Organizational Behavior** | **B22MB02** | **L/T/P :2/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Gain understanding of the Concepts of Management, its Evolution, Functions and the Theories contributed by various Management Thinkers.  |
| 2 | Learn the process of planning, goal setting and the process of decision making with the help of various models.  |
| 3 | Learn the processes of Organizing and Controlling with the help of various Organizational Structures.  |
| 4 | Appreciate the relevance of Individual and group behaviour in an organization and the role of Culture and dynamics  |
| 5 | Identify different Leadership Styles, Skills and the Theories of Motivation |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 2** |
| **IV Year I Sem**  | **Simulation of Renewable Energy Systems Lab** | **B22EE45** | **L/T/P :0/0/4** |
| After learning the contents of this subject, the student must be able to |
| 1 | This course provides a foundation in discrete-time linear control system theory. |
| 2 | Analyze digital control systems using transform techniques (frequency response) and state-space methods (pole-placement). |
| 3 | Analyzing and understanding the challenges to interface digital computing devices with the Analog dynamics of most real-world systems. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year I Sem**  | **Project Stage - I** | **B22EE46** | **L/T/P :0/0 /6** |
| After learning the contents of this subject, the student must be able to |
| 1 | Identify the problem by applying acquired knowledge. |
| 2 | Ability to plan and implement an investigative or developmental project.  |
| 3 | In-depth skill to use some laboratory, modern tools and techniques |
| 4 | Ability to communicate results, concepts, analyses and ideas in written and oral form & Conduct an extended independent investigation that results in the production of a research thesis. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year II Sem**  | **Power Quality** | **B22EE47** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Basic concepts of power quality issues |
| 2 | Voltage and current during the fault period of a given power system.  |
| 3 | Sags and phase angle jumps in different types of faults |
| 4 | Various equipment behavior with voltage sags.  |
| 5 | Various interfacing devices between system and equipment to mitigate the sags and interruptions |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year II Sem**  | **Solar Power Batteries** | **B22EE48** | **L/T/P : 3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Know operating principles of different types of solar power batteries |
| 2 | Use the batteries for effective storage of solar PV. |
| 3 | Analyze the design and selection criteria of battery system |
| 4 | Know the application of batteries |
| 5 | Gain the knowledge on environmental impacts of solar power batteries |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year II Sem**  | **AI Techniques In Electrical Engineering** | **B22EE49** | **L/T/P : 3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Get the simulation knowledge |
| 2 | Analyze the concepts based on simulated results in the domain of Electrical Engineering |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year II Sem**  | **Embedded Systems Applications** |  **B22EC61** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Understand the microprocessor architecture and its components used in embedded systems |
| 2 | Understand the architecture of 8051 |
| 3 |  Write the 8051-assembly language code and Embedded ‘C’ code for interfacing various devices. |
| 4 | Understand the required RTOS for Embedded Systems |
| 5 | Develop simple embedded systems for real time operations |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year II Sem**  | **Smart Grid Technologies** | **B22EE50** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Get the knowledge to locate the power grid's elements throughout the context of the Indian grid system. |
| 2 | Prepared to recognize how important automation is to distribution and transmission. |
| 3 | Capable of utilizing evolutionary algorithms in smart grid applications. |
| 4 |  Possess an understanding of how WAMs, PDCs, PMUs, and voltage and frequency control work in smart grids. |
| 5 |  Able to manage power and voltage for micro and smart grids. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year & II Sem**  | **Electrical Distribution Systems** | **B22EE51** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Identify various Electrical loads and their characteristics & Design Distribution feeders and Identify Substation location |
| 2 | Interpret voltage drop and power loss calculations for the given Distribution System |
| 3 |  Determine the optimal location of a capacitor in distribution system and improve voltage profile |
| 4 | Analyse the different types of PF improvement |
| 5 |  Analyse the different types of voltage control |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year & II Sem**  | **Digital Control Systems** | **B22EE52** | **L/T/P :3/0/0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Acquire a strong foundation in sampling and reconstruction Z-transforms. |
| 2 |  Apply knowledge of Mathematics, Z-plane analysis to discrete time control systems. |
| 3 |  Replace the conventional control system with Digital control system. |
| 4 |  Evaluate and apply Z-plane analysis of discrete time control systems |
| 5 | Apply state feedback controllers and observers |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 3** |
| **IV Year & II Sem**  | **Machine Learning Applications To Electrical Engineering** | **B22EE53** | **L/T/P :3/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Discuss the types of machine learning. |
| 2 | Demonstrate the fundamentals of electrical engineering relevant to ML. |
| 3 | Explain the data processing concepts. |
| 4 | Apply machine learning algorithms to solve real-world problems in electrical engineering. |
| 5 | Analyze the electrical engineering case studies through machine learning. |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 9** |
| **IV Year & II Sem**  | **Project Stage-II** | **B22EE54** | **L/T/P :0/0/22**  |
| After learning the contents of this subject, the student must be able to |
| 1 | Identify the problem by applying acquired knowledge. |
| 2 | Ability to plan and implement an investigative or developmental project.  |
| 3 | In-depth skill to use some laboratory, modern tools and techniques |
| 4 | Ability to communicate results, concepts, analyses and ideas in written and oral form & Conduct an extended independent investigation that results in the production of a research thesis |
| **Course Outcome** | **Year & Semester**  | **Subject Name** | **Subject Code** | **No. of Hours** | **Credits: 2** |
| **IV Year & II Sem**  | **Technical Seminar** | **B22EE55** | **L/T/P :0/0 /0** |
| After learning the contents of this subject, the student must be able to |
| 1 | Identify and analyze the real time Electrical Engineering problems |
| 2 | Acquire awareness on latest technology and current trends in the field of Electrical Engineering. |
| 3 | Participate in discussions for enhancement of knowledge |
| 4 | Apply communication skills and Document and present technical reports following professional ethics |