

**SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA**

**Department of Electrical & Electronics Engineering**

**S3 EEE**

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| <b>MA201</b> | <b>Linear algebra and complex analysis</b> | <b>4</b> | <b>Ms Rani Thomas (AS)</b> |
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| CO1 | Demonstrate mathematical reasoning through the concept of complex analysis .                                 |
| CO2 | Analyze Conformal mapping to change regions with complicated shapes into simpler ones.                       |
| CO3 | Apply system of linear equations to solve computational tasks including processing, designing and modeling . |
| CO4 | Apply the properties of eigen values to simplify extensive calculations occurring in science and engineering |

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| <b>HS210</b> | <b>Life Skills</b> | <b>2</b> | <b>Mr. Shimin V V</b> |
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| CO1 | To improve the communication, problem solving skills and writing skills in prospective engineers            |
| CO2 | To enable them to convey thoughts and ideas thereby equipping them to face interviews and group discussions |
| CO3 | To instil moral and social values, loyalty and to learn to appreciate the rights of others                  |
| CO4 | To understand team dynamics and effectiveness and to learn and demonstrate leadership qualities             |

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| <b>EE201</b> | <b>Circuits and Networks</b> | <b>4</b> | <b>Ms Merry Mathew</b> |
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|-----|---|
| CO1 | Solve any DC and AC circuits.                       |
| CO2 | Apply graph theory in solving networks.             |
| CO3 | Apply Laplace Transform to find transient response. |

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|     |                      |
|-----|----------------------|
| CO4 | Synthesize networks. |
|-----|----------------------|

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| <b>EE203</b> | <b>Analog Electronic Circuits</b> | <b>4</b> | <b>Ms Neethu John</b> |
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|     |  |
|-----|--|
| CO1 | Design biasing scheme for transistor circuits  |
| CO2 | Model BJT and FET amplifier circuits for electronic circuit applications                               |
| CO3 | choose power amplifiers and OPAMPs with appropriate specifications for electronic circuit applications |
| CO4 | Design & analyze analog circuits using BJT and OPAMPs for specific applications                        |

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| <b>EE205</b> | <b>DC Machines and Transformers</b> | <b>3</b> | <b>Ms Ashna Mohan</b> |
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|     |   |
|-----|---|
| CO1 | Summarize the principle and operation of DC machines and transformers.  |
| CO2 | Explain the construction and different types of DC machines and transformers.                                 |
| CO3 | Analyse the performance and characteristics of DC machines and transformers for different working conditions. |
| CO4 | Recommend DC machines/Transformers for specific applications.   |

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| <b>EE207</b> | <b>Computer Programming</b> | <b>3</b> | <b>Shyam Krishna</b> |
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|     |   |
|-----|---|
| CO1 | Understand the process and concepts of computer programming and implement algorithms and flowcharts for problems. |
| CO2 | Develop C programs using Control statements, Arrays and Strings in C and Python Language                          |
| CO3 | Analyse problems, identify subtasks and implement them as functions/procedures, structures and pointers           |

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|-----|-----------------------------------|
| CO4 | Develop simple programs in Python |
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| <b>EE233</b> | <b>Programming Lab</b> | <b>1</b> | <b>Faculty from (CS), Mr. Shimin V V</b> |
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|     |   |
|-----|---|
| CO1 | Understand the process and concepts of computer programming       |
| CO2 | Know how to design, implement and test simple programs            |
| CO3 | Understand a problem and convert it into a programmable solution. |
| CO4 | Use Computer languages to construct real life programs.           |

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| <b>EE231</b> | <b>Electronic Circuits Lab</b> | <b>1</b> | <b>Mr. Abhijith R Prasad , Dr Vijikala</b> |
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|-----|---|
| CO1 | The students will be able to design various application level circuit using diode             |
| CO2 | The students will be able to design amplifier circuit using BJT and JFET                      |
| CO3 | The students will be able to design various application level circuit using Opamp             |
| CO4 | The students will be able to understand and design various circuits using simulation software |

**S4 EEE**

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| <b>MA202</b> | <b>Probability Distributions, Transforms and Numerical Methods</b> | <b>4</b> | <b>Ms Lickny I</b> |
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|-----|--|
| CO1 | Apply the concept of discrete and continuous probability distributions in Engineering and real life situations |
| CO2 | Solve various equations occurring in Engineering by applying different Numerical techniques                    |
| CO3 | Apply the concepts of Fourier and Laplace transforms in interdisciplinary environments                         |

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| <b>EE202</b> | <b>Synchronous &amp; Induction Machines</b> | <b>4</b> | <b>Mr Sunil V Chandran</b> |
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|     |   |
|-----|---|
| CO1 | Explain the construction and different types of Synchronous and Induction machines                                  |
| CO2 | Summarize the principle and operation of Synchronous and Induction machines   |
| CO3 | Analyse the performance and characteristics of Synchronous and Induction machines for different working conditions. |
| CO4 | Recommend Synchronous and Induction machines for specific applications.   |

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| <b>EE204</b> | <b>Digital Electronics &amp; Logic Design</b> | <b>3</b> | <b>Dr V Vijikala</b> |
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|     |  |
|-----|--|
| CO1 | Understand various number systems and boolean algebra                  |
| CO2 | Design and analyse various combinational and sequential logic circuits |
| CO3 | Design and analyse ADC and DAC circuits                                |
| CO4 | Acquire basic knowledge on VHDL  |

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| <b>EE206</b> | <b>Material Science</b> | <b>3</b> | <b>Neethu Raj P R</b> |
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| CO1 | Analyze the characteristics of Insulating, conducting, super-conducting and semiconducting materials used in electrical machines and power conversion devices. |
| CO2 | Evaluate the properties of dielectric and magnetic materials.  |
| CO3 | Summarize the properties of special purpose materials used in electrical applications.   |
| CO4 | Identify suitable materials for manufacturing of electrical equipments / devices   |

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| <b>EE208</b> | <b>Measurements &amp; Instrumentation</b> | <b>3</b> | <b>Mr Jo Joy, Ms Neethu John</b> |
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| CO1 | To compare different types of instruments-their working principles, advantages, and disadvantages.                     |
| CO2 | To understand the operating principles of various meters and equipments used for measurement of electrical quantities. |
| CO3 | To understand the operating principles of various meters used for measurement of Magnetic quantities                   |
| CO4 | To understand the operating principles of various meters and equipments used for measurement of electronics quantities |

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| <b>EE232</b> | <b>Electrical Machines Lab I</b> | <b>1</b> | <b>Mr Sebin Davis K, Mr Jo Joy</b> |
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|-----|---|
| CO1 | Design and analyze the performance of the alternator  |
| CO2 | Design and analyze the performance of induction machines  |
| CO3 | Design systems to suit a prerequisite   |
| CO4 | Function effectively in a group and to communicate effectively the complex engineering activities |

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| <b>EE234</b> | <b>Circuits &amp; Measurements Lab</b> | <b>1</b> | <b>Dr V Vijikala</b> |
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| CO1 | To understand and verify different DC network theorems by setting up various networks  |
| CO2 | To understand and calibrate different meters used for electrical measurements  |
| CO3 | To determine impedance, admittance, power factor and real/reactive/ apparent power drawn in RLC series/parallel circuits.            |
| CO4 | To understand the characteristics of Thermistor, RTD, Thermocouple, LVDT, strain gauge/ Load cell and other electronic measurements. |

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**S5 EEE**

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| <b>EE301</b> | <b>Power Generation, Transmission and Protection</b> | <b>4</b> | <b>Ms Neethu John</b> |
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|     |   |
|-----|---|
| CO1 | Discuss different types of power generating station & energy related terms                            |
| CO2 | Differentiate the features of overhead, underground transmission line                                 |
| CO3 | Analyze the transmission line parameters and various protection schemes to be adopted in power system |
| CO4 | Summarize the HVDC ,Flexible AC transmission & power distribution systems                             |

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| <b>EE303</b> | <b>Linear Control Systems</b> | <b>3</b> | <b>Ms Merry Mathew</b> |
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| CO1 | To develop mathematical models of various systems.                              |
| CO2 | Analyse the stability aspects of linear time invariant systems.                 |
| CO3 | Apply root locus technique for stability analysis.                              |
| CO4 | Analyze performance characteristics of system using Frequency response methods. |

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| <b>EE305</b> | <b>Power Electronics</b> | <b>3</b> | <b>Ms Drisya K Sasi</b> |
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|     |   |
|-----|---|
| CO1 | Understand the concept of various power semiconductor devices     |
| CO2 | Design triggering circuits for power semiconductor devices        |
| CO3 | Analyze and design different types of power electronic converters |
| CO4 | Distinguish various switching techniques                          |

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| <b>EE307</b> | <b>Signals and Systems</b> | <b>3</b> | <b>Mr. Abhijith R Prasad</b> |
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| CO1 | Define, represent, classify and characterize basic properties of continuous and discrete time signals and systems. |
| CO2 | Represent and analyse signals in Fourier series(CT)  |
| CO3 | Interpret properties of Laplace, Fourier transforms  |
| CO4 | Analyse discrete time systems with Z transform   |

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| <b>EE309</b> | <b>Microprocessor and Embedded Systems</b> | <b>3</b> | <b>Dr Vijikala</b> |
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| CO1 | The students will be able to apply the fundamentals of assembly level programming of 8085 microprocessor and 8051 microcontroller. |
| CO2 | The students will be able to execute real time interfaces with microprocessor.   |
| CO3 | The students will be able to develop skills for writing C programs for 8051 microcontroller.                                       |
| CO4 | The students will be able to design microprocessors/microcontrollers-based systems.  |

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| <b>EE367</b> | <b>New and Renewable Energy Systems</b> | <b>3</b> | <b>Ms Ashna Mohan</b> |
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|-----|---|
| CO1 | Identify global and Indian energy sources.  |
| CO2 | The students will be able to design and analyse the performance of small isolated renewable energy sources. |
| CO3 | Develop sustainable solutions to energy related challenges using renewable energy sources.                  |
| CO4 | Explain capture, conversion and application of renewable energy sources.                                    |

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| <b>EE341</b> | <b>Design Project</b> | <b>2</b> | <b>Mr Sebin Davis K</b> |
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| CO1 | Apply Concept of Design Thinking to Solve an Engineering Problem to Solve.  |
| CO2 | Think innovatively on the development of components, products, processes or technologies in the engineering field |
| CO3 | Discuss & Express Their ideas & Solutions on a particular topic among a group of People                           |
| CO4 | Design a workable prototype model for a given Problem   |

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| <b>EE331</b> | <b>Digital Circuits and Embedded Systems Lab</b> | <b>1</b> | <b>Dr Vijikala , Ms Drisya K Sasi</b> |
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|     |   |
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| CO1 | Design, setup and analyze various digital circuits                  |
| CO2 | Simulate logic circuits using VHDL & VERILOG                        |
| CO3 | Design and analyze programs using 8085 for a particular application |
| CO4 | Design and analyze programs using 8086 for a particular application |
| CO5 | Design and analyze programs using 8051 for a particular application |

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| <b>EE333</b> | <b>Electrical Machines Lab II</b> | <b>1</b> | <b>Mr Jo Joy , Mr. Abhijith R Prasad</b> |
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|     |   |
|-----|---|
| CO1 | Design and analyze the performance of the alternator  |
| CO2 | Design and analyze the performance of induction machines  |
| CO3 | Design systems to suit a prerequisite   |
| CO4 | Function effectively in a group and to communicate effectively the complex engineering activities |



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| <b>EE302</b> | <b>Electromagnetics</b> | <b>4</b> | <b>Ms Neethu John</b> |
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| CO1 | Differentiate different types of coordinate systems and use them for solving the problems of electromagnetic field theory.   |
| CO2 | To describe static electric and magnetic fields, their behavior in different media, associated laws, boundary conditions and electromagnetic potentials.                           |
| CO3 | To use integral and point form of Maxwell's equations for solving the problems of electromagnetic field theory.  |
| CO4 | To describe time varying fields, propagation of electromagnetic waves in different media, poynting theorem and to apply the theory of electromagnetic waves in practical problems. |

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| <b>EE304</b> | <b>Advanced Control Theory</b> | <b>3</b> | <b>Mr Anoop V P</b> |
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| CO1 | Discuss the different controller and compensator types                                   |
| CO2 | Analyse systems using the state space method   |
| CO3 | Analyse the sampled data control system and discuss the state feedback controller design |
| CO4 | Discuss about non-linear systems and stability analysis with phase plane analysis        |

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| <b>EE306</b> | <b>Power Systems Analysis</b> | <b>3</b> | <b>Ms Ashna Mohan</b> |
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| CO1 | Design mathematical models for power system components.   |
| CO2 | Analyze power systems under normal and abnormal conditions.   |
| CO3 | Apply knowledge of Advanced Mathematics and Electrical Engineering concepts to formulate and solve complex power system problems such as load flow, economic dispatch and load frequency control. |
| CO4 | Apply mathematical techniques to evaluate system stability.   |

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| <b>EE308</b> | <b>Electric Drives</b> | <b>3</b> | <b>Ms Merry Mathew</b> |
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|     |   |
|-----|---|
| CO1 | Understand basic concepts of electric drives and various control techniques employed for controlling DC and AC motor drives |
| CO2 | Design and analyse various semiconductor controlled DC and AC motor drives  |
| CO3 | Justify the selection of drives for various applications  |
| CO4 | Understand control techniques of Permanent Magnet Synchronous Motor   |

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| <b>EE372</b> | <b>Biomedical Instrumentation</b> | <b>3</b> | <b>Dr V Vijikala</b> |
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| CO1 | Understand about the various physiological systems of the body and problems encountered in biomedical measurements |
| CO2 | Understand the various types of electrodes used in biomedical instrumentation                                      |
| CO3 | Understanding of various potentials in the body and how it is measured by various instruments.                     |
| CO4 | Understand the various biomedical instruments used for clinical diagnosis and surgery                              |

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| <b>HS300</b> | <b>Principles of Management</b> | <b>3</b> | <b>Mr Madhujith T</b> |
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| CO1 | Develop ability to critically analyse and evaluate a variety of management practices in the contemporary context                                 |
| CO2 | Understand and apply a variety of management and organisational theories in practice   |
| CO3 | Able to mirror existing practices or to generate their own innovative management competencies, required for today's complex and global workplace |
| CO4 | Critically reflect on ethical theories and social responsibility ideologies to   |

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|  | create sustainable organisations |
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| <b>EE332</b> | <b>Systems and Control Lab</b> | <b>1</b> | <b>Mr Anoop V P, Mr Sunil V</b> |
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| CO1 | Identify the system and develop mathematical model for it.                          |
| CO2 | Discuss the performance analysis methods for systems.                               |
| CO3 | Design suitable controllers and outline the effect of it on the system performance. |
| CO4 | Use MATLAB to review the control system design procedure.                           |

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| <b>EE334</b> | <b>Power Electronics &amp; Drives Lab</b> | <b>1</b> | <b>Ms Merry Mathu, Ms Neethu Raj P R</b> |
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| CO1 | Students will be able to design and set up various power electronic converters.                                  |
| CO2 | Students will be able to analyse various power electronic converters.  |
| CO3 | Application of various power electronic converters for the implementation of various motor control applications. |
| CO4 | Simulation of various power electronic converters and their application in various drives                        |

**S7 EEE**

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| <b>EE401</b> | <b>Electronic Communication</b> | <b>3</b> | <b>Dr Vijikala</b> |
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| CO1 | The students will be able to understand the need of modulation in transferring a signal through either wireless or wired communication systems. |
| CO2 | The students will be able to apply analog modulation techniques and receiver fundamentals in analog communication.                              |
| CO3 | The students will be able to apply baseband digital encoding & decoding   |

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|     | techniques in the storage and transmission of digital signal through wired channel.   |
| CO4 | The students will be able to understand the performance of communication systems in the presence of noise and interference. |

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| <b>EE403</b> | <b>Distributed Generation &amp; Smart Grids</b> | <b>3</b> | <b>Mr Jo Joy</b> |
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| CO1 | Explain various distributed generation systems                         |
| CO2 | Understand the concept of microgrids and their control scheme          |
| CO3 | Understand the concept of Smart Grid and its components                |
| CO4 | Familiarize with energy management concepts and demand side management |

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| <b>EE405</b> | <b>Electrical System Design</b> | <b>4</b> | <b>Mr Sebin Davis K</b> |
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|     |  |
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| CO1 | Apply the basic Rules and Regulations of electrical systems & Design to prepare the schematic diagrams |
| CO2 | Design Cable & Busbar sizes by Conducting Short circuit & Voltage drop calculations.                   |
| CO3 | Apply Energy conservation techniques and Design Solar Power Generation Systems                         |
| CO4 | Design lighting Schemes by conducting the Lighting calculations  |

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| <b>EE407</b> | <b>Digital Signal Processing</b> | <b>3</b> | <b>Ambily Francis</b> |
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| CO1 | Students will be able to experiment Discrete Fourier Transform concept in various signal processing operations like frequency analysis of signals, FFT computation. |
| CO2 | Students will be able to design equivalent realizations of FIR and IIR digital filters in different structural forms.   |
| CO3 | Students will be able to understand the architecture of a digital signal processor  |

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|     | and investigate some programming issues in fixed point digital signal processor  |
| CO4 | Students will be able to design and implement DFT algorithms and process in simulation environment with the help of MATLAB or other programming languages. |

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| <b>EE409</b> | <b>Electrical Machine Design</b> | <b>3</b> | <b>Ms Drisya K Sasi</b> |
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|     |  |
|-----|--|
| CO1 | Understand the basic concepts of electrical machine design                               |
| CO2 | Apply the concept of operating principles of static and rotating electrical machines     |
| CO3 | Design electrical machines that meet the specified needs with appropriate considerations |
| CO4 | Apply computer based techniques in the design of electrical machines                     |

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| <b>EE469</b> | <b>Electric &amp; Hybrid Vehicles</b> | <b>3</b> | <b>Mr. Shimin V V</b> |
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| CO1 | To present a comprehensive overview of electric and hybrid electric vehicles.   |
| CO2 | To differentiate between different types of drivetrain and to choose between them according to requirement by proper component sizing                     |
| CO3 | To study the components of an electric vehicle, their types and their sizing based on design requirements   |
| CO4 | To study about the different communication systems in an electric vehicle and energy management in electric vehicles, their classification and comparison |

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| <b>EE431</b> | <b>Power System Lab</b> | <b>1</b> | <b>Ms Ashna Mohan, Ms Neethu John</b> |
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| CO1 | Formulate admittance and impedance matrix of any given power system. |
| CO2 | Simulate load flow analysis of the given system.                     |

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| CO3 | Perform fault analysis & prepare report regarding the fault and its effect on the power system. |
| CO4 | Test the earth resistance & also measure the ratio of the given CT and PT.                      |

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| <b>EE451</b> | <b>Seminar and Project Preliminary</b> | <b>2</b> | <b>Ms Merry Mathew , Ms Drisya K Sasi</b> |
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**Project**

|     |   |
|-----|---|
| CO1 | Generate and implement innovative ideas for social benefit and develop the ability to work as a team. |
| CO2 | Reorganize the procedures with a concern for society, environment and ethics                          |
| CO3 | Analyze and discuss the results to draw valid conclusions   |
| CO4 | Prepare a report as per recommended format and defend the work  |
| CO5 | Explore the possibility of publishing papers in peer reviewed journals/conference proceedings         |

**Seminar**

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|-----|--|
| CO1 | To promote and develop presentation skills.  |
| CO2 | To expose students to the 'real' working environment and get acquainted with research. |
| CO3 | To get an awareness about the day to day technologies used by engineers worldwide.     |
| CO4 | To develop and enhance leadership skills.  |

**S8 EEE**

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| <b>EE402</b> | <b>Special Electrical Machines</b> | <b>3</b> | <b>Mr Sebin Davis K</b> |
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|     |   |
|-----|---|
| CO1 | Explain construction of different special electrical machines |
| CO2 | Explain the working principle of special electrical machines  |

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|     |   |
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| CO3 | Summarize the performance analysis of special electrical machines in varying conditions |
| CO4 | Obtain knowledge about applications which these machines are used                       |

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| <b>EE404</b> | <b>Instrumentation &amp; Industrial Automation</b> | <b>3</b> | <b>Mr Jo Joy</b> |
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| CO1 | Select instruments and transducers for various physical variables.   |
| CO2 | Get an insight on data acquisition, processing and monitoring system |
| CO3 | Design various signal conditioning systems for transducers.          |
| CO4 | Analyze dynamic responses of various systems.                        |
| CO5 | Get the concepts of virtual instrumentation                          |
| CO6 | Understand the programming realization of PLC                        |

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| <b>EE474</b> | <b>Energy Management &amp; Auditing</b> | <b>3</b> | <b>Mr Madhujith T</b> |
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| CO1 | Students will be able to understand the concept of energy management and energy management opportunities    |
| CO2 | Students will be able to understand the different methods used to control peak demand                       |
| CO3 | Students will be able to carry out energy auditing  |
| CO4 | Students will be able to understand the different methods used for the economic analysis of energy projects |

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| <b>CE482</b> | <b>Environmental Impact Assessment</b> | <b>3</b> | <b>Ms Vasudha V</b> |
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| CO1 | To understand the awareness of various pollution,its sources,effects and its impacts |
| CO2 | To study about solid waste ,it's classification and its effects                      |

**SAHRDAYA COLLEGE OF ENGINEERING AND TECHNOLOGY, KODAKARA**  
**Department of Electrical & Electronics Engineering**

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| CO3 | To apply various tools and techniques related to Environment impact assessment |
| CO4 | To understand the standards in air,water and noise                             |

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| <b>EE492</b> | <b>Project</b> | <b>6</b> | <b>Ms Neethu John</b> |
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|-----|---|
| CO1 | Generate and implement innovative ideas for social benefit and develop the ability to work as a team. |
| CO2 | Reorganize the procedures with a concern for society, environment and ethics                          |
| CO3 | Analyze and discuss the results to draw valid conclusions   |
| CO4 | Prepare a report as per recommended format and defend the work  |
| CO5 | Explore the possibility of publishing papers in peer reviewed journals/conference proceedings         |