



**PSN COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)**

Melathediyoor, Tirunelveli– 627 15

(Approved by AICTE and Recognised by UGC Under Section 2 (f) & 12(B)

An ISO 9001:2015 Certified Institution

(Accredited by NAAC, Affiliated to Anna University)



Department of Electronics and Instrumentation Engineering

Course Outcomes

(For Regulation 2018)

Course Name: (501001/TECHNICAL ENGLISH)	
CO	COURSE OUTCOMES
CO 1	Write cohesively and coherently and flawlessly avoiding grammatical errors.
CO 2	Listen/view and comprehend different Spoken discourses/excerpts in different accents.
CO 3	Communicate with one or many listeners using appropriate communicative strategies.
CO 4	Read different genres of texts adopting various reading strategies
CO 5	Writing skills enable a student to write comprehend passages, report and paragraph.
Course Name: (501002/ ELEMENTARY MATHEMATICS FOR ENGINEERS)	
CO	COURSE OUTCOMES
CO 1	Find the Eigen values and Eigen vectors by matrix methods.
CO 2	Understand different types of sequences of series and their convergence.
CO 3	Know the concepts of differentiation and integration and applications of indefinite integral.
CO 4	Form and solve the inequalities by LPP and solve transportation problems.
CO 5	Understand the concepts of three dimensions and form the equations of tangent plane, cone.
Course Name: (501003/ APPLIED PHYSICS I)	
CO	COURSE OUTCOMES
CO 1	Understand the properties of different types of metals
CO 2	Gain knowledge about conductivity of different types of materials
CO 3	Study about magnetism property of the materials
CO 4	Know the applications of sound waves in engineering & medicine
CO 5	Understand the application of laser in engineering & medicine

Course Name: (501004/ APPLIED CHEMISTRY I)

CO	COURSE OUTCOMES
CO 1	Do water Treatment for domestic & industrial purpose
CO 2	Study different kinds of advanced materials and their applications
CO 3	Study different kinds of polymers & their applications
CO 4	Basics of thermo dynamics and its concept
CO 5	Familiar with name materials & their applications in different fields

Course Name: (501005/ ENGINEERING GRAPHICS) *

CO	COURSE OUTCOMES
CO 1	Perform free hand sketching of basic geometrical shapes and multiple views of objects.
CO 2	Draw orthographic projections of lines, planes and solids
CO 3	Obtain development of surfaces.
CO 4	Prepare isometric and perspective views of simple solids.

Course Name: (501006/FUNDAMENTALS OF COMPUTERS AND PYTHON PROGRAMMING)

CO	COURSE OUTCOMES
CO 1	Have fundamental knowledge on basics of computers and Number System
CO 2	Work on MS-Office
CO 3	Write, compile and debug simple programs in Python
CO 4	Understand the concept of functions in Python
CO 5	Use different Compound data types in Python.

Course Name: (501101/ APPLIED PHYSICS & CHEMISTRY LAB – I)

CO	COURSE OUTCOMES
CO 1	Gain practical knowledge by applying the experimental methods to correlate with physics and chemistry theory.
CO 2	Able to gain Working knowledge of fundamental Physics and chemistry.
CO 3	Ability to apply the design process to engineering application.
CO 4	Ability to use modern engineering techniques and tools, including software and laboratory instrumentation.

Course Name: (501102/ COMPUTER LAB)

CO	COURSE OUTCOMES
CO 1	Create and edit their own documents, sheets and presentations
CO 2	Write their own programs to solve problems by using Python

Course Name: (501103/ WORKSHOP PRACTICE)

CO	COURSE OUTCOMES
CO 1	Apply the knowledge of pipeline connections to household fittings and industrial buildings.
CO 2	Prepare the different joints in roofs, doors, windows and furniture.
CO 3	Perform the various welding processes and know about its applications.
CO 4	Produce a tray and funnel using sheet metal.
CO 5	Prepare square fitting and “V” fitting

Course Name: (501007/ BUSINESS COMMUNICATION AND PRESENTATION SKILLS)

CO	COURSE OUTCOMES
CO 1	Communicate with one or many listeners’ by using effective business communication.
CO 2	Create formal reports and proposals cohesively and creatively and flawlessly.

CO 3	Understand basic communicative mannerisms, cultural factors and emotional intelligence.
CO 4	Develop and deliver powerful presentation and confidence in public speaking.
CO 5	Produce resumes and cover letters.
Course Name: (501008/ ENGINEERING MATHEMATICS – I)	
CO	COURSE OUTCOMES
CO 1	Find the optimal value o by partial differentiation and to find area and volume by integrals.
CO 2	To apply Jacobian, divergence, curl in Engineering.
CO 3	Solve line, path and surface integrals.
CO 4	Solve ordinary differential equations by various methods.
CO 5	Distinguish analytic functions and their properties.
Course Name: (501009/ APPLIED PHYSICS II)	
CO	COURSE OUTCOMES
CO 1	Find the energy of small particle
CO 2	Find the structure of different material in different temperature
CO 3	Study different types of fiber optics used in communication systems
CO 4	Gain knowledge on the thermal properties of different types of materials
CO 5	Study the engineering applications of magnetic materials
Course Name: (501010/ APPLIED CHEMISTRY II)	
CO	COURSE OUTCOMES
CO 1	Know the Principles & applications of electro chemistry
CO 2	Understand about corrosion & its protection techniques
CO 3	Gain Knowledge about materials used in energy production

CO 4	To study the properties of different kinds of alloys & its application
CO 5	Understand various instrumental techniques for sample processing
Course Name: (501011/ ENGINEERING MECHANICS)	
CO	COURSE OUTCOMES
CO 1	Illustrate the vectorial and scalar representation of forces and moments
CO 2	Evaluate the properties of surfaces and solids
CO 3	Analyze the different type of motion
CO 4	Determine the friction and the effects by the laws of friction
CO 5	Calculate dynamic forces exerted in rigid body
Course Name: (501012/ PROGRAMMING IN C)	
CO	COURSE OUTCOMES
CO 1	Have fundamental knowledge on C language.
CO 2	Design programs involving decision structures, loops and functions.
CO 3	Define small functions for solving complex applications.
CO 4	Write, compile and debug programs in C language using Arrays.
CO 5	Understand the concept of Structure and Union.
Course Name: (501013/ BASIC ENGINEERING)	
CO	COURSE OUTCOMES
CO 1	Explain the usage of construction material and proper selection of construction materials and also measure distances and area by surveying.
CO 2	Understand the basics of Energy Sources and Power Generation.
CO 3	Acquire the knowledge about various manufacturing processes.

CO 4	Solve simple circuits and express the concept of fundamentals of circuits.
CO 5	Express the function of semiconductor devices and develop the truth tables of logic.
Course Name: (501104/ APPLIED PHYSICS & CHEMISTRY LAB II)	
CO	COURSE OUTCOMES
CO 1	Gain practical knowledge by applying the experimental methods to correlate with physics and chemistry theory.
CO 2	Apply the various procedures and techniques for the experiments.
CO 3	Apply the various procedures and techniques for the experiments.
CO 4	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results.
CO 5	Ability to use the different measuring devices and meters to record the data with precision.
Course Name: (501105/ C PROGRAMMING LAB)	
CO	COURSE OUTCOMES
CO 1	Able to solve simple problems using C' Language.
CO 2	Able to execute programs using control statements
CO 3	Able to handle arrays in C' Programs.
CO 4	Able to write functions and to solve some complicated problems in C.
Course Name: (501106/ BASIC ELECTRICAL AND ELECTRONICS LAB)	
CO	COURSE OUTCOMES
CO 1	Design House wiring system
CO 2	Measure the various Electrical Quantities in a circuit
CO 3	Attend the trouble shooting of electrical equipments
CO 4	Check the status of Semiconductor devices
CO 5	Check the Functioning of Logic Gates

Course Name: (501014/ ENGINEERING MATHEMATICS II)

CO	COURSE OUTCOMES
CO 1	Find the Fourier series for a function defined on closed interval.
CO 2	Formulate and solve PDE of first order.
CO 3	Formulate and solve PDE of higher order.
CO 4	Choose an appropriate method to solve complex integration.
CO 5	Identify problem evaluation techniques in theory of equation.

Course Name: (506001/ DIGITAL LOGIC CIRCUITS)

CO	COURSE OUTCOMES
CO 1	Recollecting the various number systems and simplifications using mathematical expression and understand the concepts of binary codes and digital logic families
CO 2	Understand the design and implement combinational logic circuits.
CO 3	Understand the design and implementation of synchronous sequential circuits
CO 4	Design asynchronous sequential circuits and describe the operation of Programmable Logic Devices
CO 5	Understand the digital simulation techniques for application oriented logic circuits using VHDL coding

Course Name: (506003/ ELECTRICAL MEASUREMENTS)

CO	COURSE OUTCOMES
CO 1	Know the basics of measurements and understand the principle of Voltage and Current measuring instruments
CO 2	Obtain knowledge in measurement techniques for power and energy
CO 3	Acquire a comprehensive knowledge about Potentiometers and Instrument transformers
CO 4	Get wide knowledge about resistance measuring methods
CO 5	Understand the inductance and capacitance measurement concepts

Course Name: (506002/ ELECTRICAL MACHINES)

CO	COURSE OUTCOMES
CO 1	The ability to explain the working principle, characteristics and speed control of DC Motors
CO 2	The ability to express the construction, working and testing on transformers.
CO 3	The ability to expose their knowledge in synchronous machines.
CO 4	The ability to expose their knowledge in Induction machines.
CO 5	The ability to explain about the features of single phase induction motor and special machines.

Course Name: (504001/ ELECTRIC CIRCUITS AND NETWORKS) *

CO	COURSE OUTCOMES
CO 1	Analysis the complex circuits using mesh current and nodal voltage method.
CO 2	Solve the complex circuits using network theorems.
CO 3	Derive the steady state and transient response of RL, RC and RLC circuits.
CO 4	Express the concept of Resonance and coupled circuits.
CO 5	Solve the balance and unbalanced load condition in three phase circuits.

Course Name: (504004/ ELECTRONIC DEVICES AND CIRCUITS)

CO	COURSE OUTCOMES
CO 1	Analyze the characteristics of the p-n junction diodes.
CO 2	Analyze the characteristics of transistors.
CO 3	Explain their understanding about the behavior of power control devices.

CO 4	Explain the functioning of optoelectronic devices.
CO 5	Design diode based circuits for the given specifications.
Course Name: (506101/ ELECTRONIC DEVICES AND CIRCUITS LABORATORY)	
CO	COURSE OUTCOMES
CO 1	Operate electronic test equipment and hardware/software tools to create, evaluate and troubleshoot transistor based circuits by applying the knowledge on them with an understanding of their limitations and impact on society, environment.
CO 2	Work as part of a team and as individual effectively in designing simple circuits following the safety procedures and ethics
CO 3	Communicate the technical information related to designed electronic circuits by means of oral and written reports
Course Name: (504102/ ELECTRICAL MACHINES LABORATORY)	
CO	COURSE OUTCOMES
CO 1	Use characteristics of various electrical drives depending on their type excitation.
CO 2	Develop knowledge helpful for application of DC and AC machines.
CO 3	Conduct speed control of different types of electrical machines.
CO 4	Conduct different types of testing in electrical machines.
CO 5	Apply the procedure for the measurement of electrical quantity using various meters.
Course Name: (506102/ ENGLISH LANGUAGE LAB FOR ENGINEERS)	
CO	COURSE OUTCOMES
CO 1	Communicate using right pronunciation.
CO 2	Communicate with one or many listeners' using appropriate communicative strategies.
CO 3	Write cohesively and coherently and flawlessly avoiding grammatical errors
CO 4	To acquire thorough knowledge in Technical writing skills.

Course Name: (501109/ CAREER SKILL DEVELOPMENT TRAINING - I)

CO	COURSE OUTCOMES
CO 1	Students acquire knowledge on English Grammar, Analytical & Logical reasoning.
CO 2	Students will be facilitated to set their career goals.

Course Name: (501801/ ENVIRONMENTAL STUDIES) #

CO	COURSE OUTCOMES
CO 1	Understand the different environmental systems
CO 2	Know about biodiversity
CO 3	Understand different environmental pollution
CO 4	Study and understand the natural resources
CO 5	Understand social issues

Course Name: (501020/ ENGINEERING MATHEMATICS III)

CO	COURSE OUTCOMES
CO 1	Apply Laplace transform in Engineering.
CO 2	Evaluate the Fourier transform of continuous functions.
CO 3	Solve difference equation by Z- Transform.
CO 4	Apply PDE in Engineering.
CO 5	Understand the concept of logics.

Course Name: (506004/ INDUSTRIAL INSTRUMENTATION - I)

CO	COURSE OUTCOMES
CO 1	Understand the construction and working of instruments used for measurement of force, torque, speed.
CO 2	Analyze the acceleration and vibration and calibration of instruments.

CO 3	Apply the pressure and vacuum measurement techniques and calibration of instruments.
CO 4	Apply the concept of calibration, error compensation techniques and selection of instruments in temperature measurement.
CO 5	Design the circuit for temperature compensation, calibration of temperature measuring instruments and non contact type temperature measurement.
Course Name: (506005/ TRANSDUCER ENGINEERING)	
CO	COURSE OUTCOMES
CO 1	Understand the requirement and classification of transducers and the behavior of transducers under static and dynamic conditions and hence model the transducer.
CO 2	Understand the different types of resistive transducers and their application areas.
CO 3	Acquire knowledge on capacitive and inductive transducers
CO 4	Gain knowledge on variety of transducers, MEMS and Smart transducers
CO 5	Understand the transducer application in industries.
Course Name: (506007/ ANALOG INTEGRATED CIRCUITS)	
CO	COURSE OUTCOMES
CO 1	Design linear and non linear applications of OP – AMPS
CO 2	Design applications using analog multiplier and PLL
CO 3	Design ADC and DAC using OP – AMPS
CO 4	Generate waveforms using OP – AMP Circuits
CO 5	Analyze special function ICs
Course Name: (506008/ OBJECT ORIENTED PROGRAMMING) *	
CO	COURSE OUTCOMES
CO 1	Define principles of Object Oriented programming.
CO 2	Outline the differences between object oriented programming and procedure oriented programming.
CO 3	Develop solutions for problems using class and object concepts.

CO 4	Make use of overloading and inheritance concepts to solve problems.
CO 5	Develop programs for file and template related concepts.
Course Name: (506103/ ANALOG AND DIGITAL INTEGRATED CIRCUITS LABORATORY)	
CO	COURSE OUTCOMES
CO 1	Familiarize the calculation of efficiency in amplifiers
CO 2	Design and measure the Regulation characteristics in differential amplifier.
CO 3	To design the wien bridge oscillator using op-amp.
CO 4	To design an IC 555 timer circuit.
CO 5	To design PLL and conversion techniques.
Course Name: (506105/ TRANSDUCERS AND MEASUREMENTS LABORATORY)	
CO	COURSE OUTCOMES
CO 1	To demonstrate the performance characteristics of various transducers.
CO 2	To demonstrate the working of various measurement bridges.
CO 3	Design mathematical modeling of transducers using MATLAB.
Course Name: (501113/ CAREER SKILL DEVELOPMENT TRAINING- II)	
CO	COURSE OUTCOMES
CO 1	Increase their skill of listening, writing and speaking.
CO 2	Increase their personality development, mannerisms Skill and Attitude.
CO 3	Increase their interpersonal relationship.
CO 4	Increase their knowledge of verbal and non verbal reasoning.
CO 5	Increase their experience of group discussion and mock interviews.

Course Name: (503011/ NUMERICAL METHODS)

CO	COURSE OUTCOMES
CO 1	Find the values of the variables using iterative methods.
CO 2	Knowledge of methods to find interpolates values.
CO 3	Solve complicated differentiation and integration by numerical methods.
CO 4	Know the method of finding numerical solution for differential equation by initial value problems.
CO 5	Know the method of finding numerical solution for differential equation by final value problems.

Course Name: (506009/ MODERN ELECTRONIC INSTRUMENTATION)

CO	COURSE OUTCOMES
CO 1	Know about the basics of different digital instruments.
CO 2	Acquire a comprehensive knowledge about oscilloscope and recording devices.
CO 3	Understand the principle and working of various types of wave analyzers and waveform generators.
CO 4	Understand and analyze the types of modulations, Demonstrate about various blocks in Transmitters and Receivers and Analyze all Modulation techniques in time and frequency
CO 5	Acquire knowledge about the current trends in digital instrumentation.

Course Name: (506010/ CONTROL SYSTEM ENGINEERING)

CO	COURSE OUTCOMES
CO 1	Ability to apply the knowledge of mathematics, science and engineering fundamentals to analyze various representations of system.
CO 2	Ability to analyze the models of linear system in time domain.
CO 3	Ability to analyze the models of linear system in frequency domain.
CO 4	Ability to analyze the stability and to design appropriate compensator for the given specifications.
CO 5	Ability to analyze state variable for linear and time invariant systems.

Course Name: (506011/ ANALYTICAL INSTRUMENTATION)

CO	COURSE OUTCOMES
CO 1	Understand the theory and operational principles of instrumental methods for identification and quantitative analysis of chemical substances by different types of spectroscopy.
CO 2	Have a fundamental knowledge on gas chromatography and liquid chromatography.
CO 3	Obtain a fundamental understanding of the underlining principles of physics as they relate to specific instrumentation used for gas analyzers and pollution monitoring instruments.
CO 4	Gain knowledge on the important measurement in many chemical processes and laboratories handling liquids or solutions.
CO 5	Understand the working principle, types and applications of NMR and Mass spectroscopy.

Course Name: (506012/ INDUSTRIAL INSTRUMENTATION - II)

CO	COURSE OUTCOMES
CO 1	Ability to understand the construction, installation and working of different variable head type flow meters.
CO 2	Ability to understand the construction, working and calibration of different quantity flow meters, variable area flow meters, mass flow meters.
CO 3	Ability to understand the construction and working electrical type, open channel and solid flow rate measurement.
CO 4	Ability to gain knowledge about the construction, working of level measurement.
CO 5	Ability to acquire knowledge about the measurement of density, viscosity, humidity and moisture.

Course Name: (506106/ INDUSTRIAL INSTRUMENTATION LABORATORY)

CO	COURSE OUTCOMES
CO 1	Identify the process of measuring industrial parameters such as torque, viscosity, Vacuum, flow and level.
CO 2	Illustrate the procedure for measuring pH and conductivity.
CO 3	Understand calibration of pressure gauge.
CO 4	Understand the operation of UV-Visible spectrophotometer.
CO 5	Design the virtual arrangement to measure the level in a tank using capacitive type level probe using "Virtual Lab".

Course Name: (506107/ CONTROL SYSTEM LABORATORY)	
CO	COURSE OUTCOMES
CO 1	Develop the mathematical model of a system
CO 2	Students will have the knowledge of time domain and frequency domain analysis
CO 3	Analyze the response and stability of the system using modern engineering tools
CO 4	Develop the compensator for the system
CO 5	Inculcate the stability analysis and controller design concepts.
Course Name: (501802/ HUMAN RIGHTS AND VALUE EDUCATION) #	
CO	COURSE OUTCOMES
CO 1	Understand duties and responsibilities
CO 2	Recognize the salient values for life
CO 3	Study about the concept of human rights
CO 4	Study the history of human rights and rule of law
CO 5	Gain good knowledge about the about the Indian business legislation
Course Name: (504017/ MICROPROCESSOR AND MICROCONTROLLER)	
CO	COURSE OUTCOMES
CO 1	Acquire knowledge in Addressing modes & instruction set of 8085 & 8051
CO 2	Study the need & use of Interrupt structure 8085 & 8051
CO 3	Understand the importance of Interfacing
CO 4	Explain the architecture of Microprocessor and Microcontroller
CO 5	Develop the Microprocessor and Microcontroller based applications

Course Name: (506013/ PROCESS CONTROL)

CO	COURSE OUTCOMES
CO 1	Ability to develop mathematical model for first order and higher order process.
CO 2	Ability to apply suitable control mode for different applications.
CO 3	Ability to analyze the various control schemes and obtain optimum controller settings using tuning Methods.
CO 4	Ability to understand the construction, working and selection of final control elements for a closed loop control system.
CO 5	Ability to apply complex control schemes for various process applications and draw P&ID diagrams for various process.

Course Name: (503015/ DIGITAL SIGNAL PROCESSING)

CO	COURSE OUTCOMES
CO 1	Understand about signals and systems
CO 2	Perform frequency transforms for the signals
CO 3	Design IIR filters
CO 4	Design FIR filters
CO 5	Design finite word length effects in digital filters

Course Name: (506014/ POWER PLANT INSTRUMENTATION)

CO	COURSE OUTCOMES
CO 1	Ability to understand overview of power generation.
CO 2	Ability to measure various parameters in power plants.
CO 3	Ability to control various loops of boiler.
CO 4	Ability to control turbine.
CO 5	Ability to understand the working of nuclear power plant with P& I diagram.

Course Name: (506107/ PROCESS CONTROL LABORATORY)

CO	COURSE OUTCOMES
CO 1	Analyze the dynamic behavior of interacting and non-interacting systems.
CO 2	Control the various closed loops of temperature, pressure, level, flow.
CO 3	Understand the complex control systems of cascade and feed forward control schemes.
CO 4	Identify the characteristics of control valve.
CO 5	Tune the PID Controller by simulation.

Course Name: (504108/ MICROPROCESSOR AND MICROCONTROLLER LABORATORY)

CO	COURSE OUTCOMES
CO 1	Write ALP Programmes for fixed and Floating Point and Arithmetic
CO 2	Interface different I/Os with processor
CO 3	Generate waveforms using Microprocessors
CO 4	Execute Programs in 8051
CO 5	Explain the difference between simulator and Emulator

ELECTIVE - I

Course Name: (506201/ PROFESSIONAL ETHICS IN ENGINEERING)

CO	COURSE OUTCOMES
CO 1	Study the awareness on Engineering Ethics providing basic knowledge about engineering Ethics, Variety of moral issues and Moral dilemmas, Professional Ideals and Virtues
CO 2	Get the basic familiarity about Engineers as responsible Experimenters, Research Ethics, Codes of Ethics, Industrial Standards
CO 3	Inculcate knowledge and exposure on Safety and Risk, Risk Benefit Analysis
CO 4	Get an idea about the Collective Bargaining, Confidentiality, Professional, Employee, Intellectual Property Rights

CO 5	Acquire knowledge about various roles of engineers in variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives
Course Name: (506202/ INDUSTRIAL ELECTRONICS)	
CO	COURSE OUTCOMES
CO 1	Ability to understand the data network fundamentals.
CO 2	Ability to understand the internet working and Rs 232 and Rs 485.
CO 3	Ability to illustrate, compare and explain the working of HART and Field bus used in process digital communication.
CO 4	Ability to summarize the operation of MODBUS, PROFIBUS protocol and its applications.
CO 5	Ability to explain and adopt the different Industrial Ethernet protocol and usage of wireless communication in process applications.
Course Name: (506203/ INDUSTRIAL DATA NETWORKS)	
CO	COURSE OUTCOMES
CO 1	Ability to understand the data network fundamentals.
CO 2	Ability to understand the internet working and Rs 232 and Rs 485.
CO 3	Ability to illustrate, compare and explain the working of HART and Field bus used in process digital communication.
CO 4	Ability to summarize the operation of MODBUS, PROFIBUS protocol and its applications.
CO 5	Ability to explain and adopt the different Industrial Ethernet protocol and usage of wireless communication in process applications.
Course Name: (506204/ CYBER SECURITY IN INDUSTRIAL AUTOMATION)	
CO	COURSE OUTCOMES
CO 1	Describe in detail about cyber security for Industrial Control System
CO 2	Discuss about treats in Industrial Control System
CO 3	Explain in detail about Industrial Control System vulnerabilities
CO 4	Discuss about cyber security in SCADA system
CO 5	Explain about Industrial Sectors Cyber Security

Course Name: (506205/ BUILDING AUTOMATION SYSTEM)	
CO	COURSE OUTCOMES
CO 1	Develop HVAC system architecture for building automation with human comfort.
CO 2	Demonstrate and analyze the process model for heating, cooling and ventilation applications.
CO 3	Design and develop different architecture of fire alarm system using field and panel components.
CO 4	Identify the appropriate CCTV access control system design for different applications in security system aspects
CO 5	Apply perimeter intrusion technology for advanced security system design applications
Course Name: (506207/ PIPING AND INSTRUMENTATION DIAGRAMS)	
CO	COURSE OUTCOMES
CO 1	Design the Electrical relay diagrams using standard symbols.
CO 2	Understand the pipe classes.
CO 3	Identify the instruments with functions.
CO 4	Understand the process flow diagrams.
CO 5	Design and implement hook up diagrams for control valve sizing.
Course Name: (506208/ DESIGN OF POWDER FILLING MACHINE)	
CO	COURSE OUTCOMES
CO 1	Understand the design criteria and control techniques of process machine in process industry.
Course Name: (506209/ CALIBRATION TECHNIQUES)	
CO	COURSE OUTCOMES
CO 1	Understand the calibration techniques in field instruments.

ELECTIVE - II**Course Name: (506210/ BIOMEDICAL INSTRUMENTATION)**

CO	COURSE OUTCOMES
CO 1	Understand the basic knowledge of physiology.
CO 2	Explore the occurrence of potential and operation of cardiovascular measurements.
CO 3	Comprehend the electro-physiological, blood flow and non - electrical parameter measurements.
CO 4	Understand the medical imaging parameter measurements.
CO 5	Discuss the methods used for monitoring the patients.

Course Name: (506211/ ROBOTICS AND AUTOMATION)

CO	COURSE OUTCOMES
CO 1	Explain the basic concepts of working of robot.
CO 2	Paraphrase the function of sensors in the robot.
CO 3	Explain the kinematics of robots.
CO 4	Construct program to use a robot for a typical application.
CO 5	Use Robots in different applications

Course Name: (506212/ INSTRUMENTATION AND CONTROL IN PAPER INDUSTRIES)

CO	COURSE OUTCOMES
CO 1	Understand the paper making process.
CO 2	Analyze the properties of paper and its measurements.
CO 3	Understand the consistency measurement.
CO 4	Understand the function of paper making machine.
CO 5	Understand the control techniques involved in paper industry.

Course Name: (506215/ IoT BASED INSTRUMENTATION)

CO	COURSE OUTCOMES
CO 1	Understand the characteristics and design of IoT.
CO 2	Understand the architectural overview of IoT.
CO 3	Analyze the technological fundamentals of IoT.
CO 4	Apply the concepts of IoT in various engineering applications.
CO 5	Understand the real world design constraints of IoT.

Course Name: (506216/ PRINCIPLES OF MANAGEMENT)

CO	COURSE OUTCOMES
CO 1	Study the evolution of Management, to study the functions and principles of management
CO 2	Learn the organizational environment, Ethics and social responsibility
CO 3	Study the vital framework namely planning of the management
CO 4	Identify and apply appropriate management techniques for managing contemporary organizations
CO 5	Learn the design theory to include the new concepts and practices of design entrepreneurship and organizational change.

Course Name: (506217/ DESIGN OF LINEAR WEIGHING MACHINE)

CO	COURSE OUTCOMES
CO 1	To understand the function of packaging machine and the elements related to Sensing, Actuation and Control.

Course Name: (506218/ VARIABLE FREQUENCY DRIVE BASED INDUSTRIAL APPLICATIONS)

CO	COURSE OUTCOMES
CO 1	Learn the basic concepts and control of VFD in various applications.

Course Name: (506901 / SENSORS AND ACTUATORS)

CO	COURSE OUTCOMES
CO 1	Understand different sensor systems used for process parameters.
CO 2	Select the sensors based on process parameters and application.
CO 3	Understand sensor signal transmission
CO 4	Understand the interconnection of sensors with Controller
CO 5	Know how to Prevent data loss or noise during sensor signal transmission

Course Name: (506902/ ELECTRIC VEHICLES)

CO	COURSE OUTCOMES
CO 1	Understand the hybrid vehicle configuration and its components, performance analysis.
CO 2	Understand the properties of batteries and its types.
CO 3	Analyze the DC and AC electrical machines used in the electric vehicles.
CO 4	Understand the electric vehicle drive systems.
CO 5	Analyze the hybrid electric vehicles.

Course Name: (506903 / INDUSTRIAL INSTRUMENTATION)

CO	COURSE OUTCOMES
CO 1	Analyze the functions of force, torque and velocity measurement.
CO 2	Understand the measurement of acceleration, vibration and density.
CO 3	Apply the temperature, pressure measurement techniques.
CO 4	Understand the level and flow measurement techniques.
CO 5	Apply the viscosity, humidity, moisture and measurement techniques.

Course Name: (506904/ PROCESS CONTROL AND AUTOMATION)

CO	COURSE OUTCOMES
CO 1	Develop the mathematical model for a physical process by using mass and energy balance equations.
CO 2	Analyze the various control actions and obtain optimum controller settings using tuning methods.
CO 3	Apply complex control schemes for various control applications.
CO 4	Identify the suitable final control elements for a closed loop systems.
CO 5	Understand the fundamentals of Programmable Logic Controller, Supervisory Control and Data Acquisition system.