DEPARTMENT OF MECHATRONICS ENGINEERING

COURSE OUTCOMES

III SEM	
COURSE NAME	ELECTRONIC DEVICES AND CIRCUITS
COURSE CODE	34031
CO1	Enumerate the concepts of semiconductor diodes, rectifiers, filters and regulators.
CO2	Interpret the working principle and operating characteristics of transistors.
CO3	Demonstrate the working of an oscillator circuits, Uni junction Transistor, and Field effect transistors.
CO4	Discuss the performance characteristics of high power semiconductor devices.
CO5	Describe opto electronic devices, wave shaping circuits and design circuits for creating automated systems.
COURSE NAME	ELECTRICAL CIRCUITS AND MACHINES
COURSE CODE	34232
CO1	Solve basic electrical circuits using basic laws
CO2	Analyse AC circuits using knowledge of vectors.
CO3	Formulate resonant frequency using the concept of Resonance.
CO4	Evaluate the characteristics of AC and DC machines and its applications.
CO5	Calculate the efficiency and losses in transformer.
COURSE NAME	MEASURING INSTRUMENTS AND SENSORS
COURSE CODE	34744
CO1	Describe the construction and working principle of various analog instruments.
CO2	Use AC, DC bridges and Oscilloscopes with relevant parameters and appropriate measurements.
CO3	Discuss different types of digital instruments, displays and recorders
CO4	Select appropriate sensor for the measurement of physical phenomenon.
CO5	Apply advanced sensors in relevant applications.

COURSE NAME	**MANUFACTURING TECHNOLOGY**
COURSE CODE	**34733**
CO1	Apply the principles and working of lathe & reciprocating machines used in manufacturing engineering components
CO2	Categorize the mechanics of milling & drilling machines to manufacture gears and other intricate shapes
CO3	Discuss the grinding & broaching machine operations, and its different techniques used in industry
CO4	Acquire knowledge on the principles, construction and working of - Unconventional machines with applications.
CO5	Exhibit basic metrological instruments to measure linear, angular and form features of component
COURSE NAME	**ELECTRONIC DEVICES AND CIRCUITS PRACTICAL**
COURSE CODE	**34034**
CO1	Demonstrate the function and characteristics of various solid-state devices, including diodes, bi-polar junction transistors, FET and UJT
CO2	Design various types of electronic circuits such as rectifiers, filters and regulated power supplies, optoelectronic and wave shaping circuits
CO3	Applying the knowledge of basic electronic components to construct the real time mini projects
COURSE NAME	**ELECTRICAL CIRCUITS AND MACHINES PRACTICAL**
COURSE CODE	**34735**
CO1	Solve DC circuits using basic electric laws and network theorems.
CO2	Conduct performance test of Electrical machines and transformers.
CO3	Design series and parallel resonance circuits for different applications.
COURSE NAME	**COMPUTER APPLICATIONS LAB**
COURSE CODE	**30001**
CO1	Prepare formatted documents using features of Ms-Word and MS Excel
CO2	Generate worksheets using functions and formulae in Excel
CO3	Prepare presentations for Workshop/Conferences with different designs and effects in MS-tools
COURSE NAME	**MANUFACTURING TECHNOLOGY LAB**
COURSE CODE	**34736**
CO1	Identify and Understand the purpose of Lathe, Milling ,Drilling ,Grinding Shaping machine tool

CO2	Practice to handle single point and multipoint cutting tools
CO3	Practice to make important machines components
IV SEM	
COURSE NAME	**PROGRAMMING IN C PRACTICAL**
COURSE CODE	**34756**
CO1	Develop programs using predefined functions and operators, types of branching and looping statements
CO2	Develop C programs to solve basic mathematical functions with user defined Functions, Strings, arrays, structure and files.
CO3	Develop C programs to apply in projects
COURSE NAME	**LIFE AND EMPLOYABILITY SKILLS PRACTICAL**
COURSE CODE	30002
CO1	Effective listening and improving speaking skills for better conversations
CO2	Inculcating team spirit skills and leadership qualities.
CO3	Enhancing employability skills through personality development
COURSE NAME	**INDUSTRIAL TRAINING-I**
COURSE CODE	34791
CO1	Adopt to the industrial environment, Organization structure with various safety norms practiced in industries
CO2	Practice professional ethics & Team work in interdepartmental environment.
CO3	Handle various tools, material & equipment with multidisciplinary activities
CO4	Practice various elements of TQM for solving simple industrial problems.
CO5	Communicate the outcomes of in-plant training through records, presentations, mini- projects and final projects
V SEM	
COURSE NAME	**ANALOG AND DIGITAL ELECTRONICS**
COURSE CODE	34244
CO1	Describe operational amplifiers, Timers and their applications.
CO2	Study on the structure of various number systems and its applications in digital design
CO3	Design various combinational circuits
CO4	Acquire the knowledge on the various sequential circuits
CO5	Discuss Analog to Digital Converters, Digital to Analog Converters and construction of memories using flip flops

COURSE NAME	**MICROCONTROLLER & PIC**
COURSE CODE	**34752**
CO1	Describe the architectural and operational configuration of 8051 Microcontroller.
CO2	Develop assembly language programs using 8051 instructions
CO3	Design microcontroller based systems using timers, serial port & Interrupts programming
CO4	Analyse the interfacing circuits for various applications of 8051 microcontroller.
CO5	Discuss the architecture and instructions of PIC 18
COURSE NAME	**MECHANICS OF MATERIALS**
COURSE CODE	34742
CO1	Describe the concepts of deformation in materials, which are subjected to axial Load and shear stress
CO2	Discuss the properties of geometrical section and calculations on thin cylinders
CO3	Determine the shear force and bending moments for Various types of beams
CO4	Estimate the torsional load over shafts and the knowledge on deflection of springs
CO5	Application of types of Gears and Belt drives in different engineering applications
COURSE NAME	**CAD/CAM**
COURSE CODE	**34754**
CO1	Describe the CAD/CAM system and its important
CO2	Apply CAD techniques to change conventional planning and manufacturing and additive manufacturing
CO3	Knowledge on types of CNS, CNC components, EDM
CO4	Create CNC programs with standard G & M codes for various machining operations
CO5	Acquire knowledge on Flexible Manufacturing systems and AGV concepts to automate industrial process.
COURSE NAME	**HYDRAULICS AND PNEUMATICS**
COURSE CODE	34743
CO1	Discuss the construction and working principle of various types of hydraulic pumps.
CO2	Demonstrate the working principle of various linear and rotary actuators.

CO3	Select hydraulic valves for various Industrial hydraulic systems.
CO4	Design hydraulic circuits for industry applications.
CO5	Describe the basic pneumatic system and components.
COURSE NAME	**ADE PRACTICAL**
COURSE CODE	34245
CO1	Design and test various waveform generation circuits using Operational Amplifiers, Comparators and IC packages.
CO2	Design and test various combinational logic circuits and systems
CO3	Design and test various sequential logic circuits and systems
COURSE NAME	**MC PRACTICAL**
COURSE CODE	34756
CO1	Demonstrate programming proficiency using the various addressing modes and data transfer instructions of the 8051 microcontroller.
CO2	Write Assembly Language Programs for arithmetic operations, number system conversions and sorting numbers.
CO3	Develop assembly language programs for various applications using 8051 microcontroller
COURSE NAME	**CAD PRACTICAL**
COURSE CODE	**34766**
CO1	Describe the tools and techniques to increase productivity–by using AUTOCAD commands and modules to draft 2-D drawings.
CO2	Standardise industrial drawing for better productivity
CO3	Create 2D and 3D models with GD&T for the given models
VI SEM	
COURSE NAME	**INDUSTRIAL INSTRUMENTATION AND AUTOMATION**
COURSE CODE	**34751**
CO1	Apply the knowledge of strain and force measuring systems to link with the Industry applications.
CO2	Evaluate the response and characteristics of torque and pressure measuring devices
CO3	Explain the working of flow and temperature measuring devices.

CO4	Interpret the knowledge of selecting PLC and their programming and troubleshooting.
CO5	Develop PLC based applications.
COURSE NAME	**PROCESS CONTROL**
COURSE CODE	**34762**
CO1	Discuss basic terminologies, need, application and representation of closed loop control systems in process industries.
CO2	Analyze the characteristics and principles of on-off and PID controllers.
CO3	Evaluate the gain of the controller by appropriate method of tuning.
CO4	Examine the characteristics and types of finite control elements.
CO5	Study the architecture of distributed and complex control system.
COURSE NAME	**AUTO ELECTRONICS**
COURSE CODE	**34753**
CO1	Relate fundamental and technological knowledge on CI and SI engine systems.
CO2	Identify automotive electrical systems and perform test electrical and electronics controls.
CO3	Discuss the sensors and actuators used in vehicle engine management system.
CO4	Illustrate vehicle control systems, fuel injection, integrated safety and telematics.
CO5	Explain the fundamentals of electric & hybrid vehicle technology.
COURSE NAME	**ROBOTICS**
COURSE CODE	**34763**
CO1	Acquire the knowledge on configuration of robots and its components
CO2	Analyze controller and drives used in robotics.
CO3	Discuss the working principle of various sensors and the functions of vision machine system
CO4	Illustrate the programming methods and languages for a robot control system
CO5	Comprehend the roles and implementations of robots in various industrial applications
COURSE NAME	**INDUSTRIAL ENGINEERING AND MANAGEMENT**
COURSE CODE	**32061**

CO1	Apply plant engineering lay out & working with different maintenance process with the importance of plant safety procedures.
CO2	Practice work study procedure for productivity planning, standard of living and method study process involving different process charts with work measurement techniques.
CO3	Organize the PPC functions involving forecasting methods, selection of machines for process planning and quality systems.
CO4	Set up the principles of personnel management involving leadership, 5S concepts, recruitment of personnel and their wage structures.
CO5	Examine the complete financial process involving working & resources of capital and material management functions.
COURSE NAME	**PROCESS CONTROL PRACTICAL**
COURSE CODE	**34764**
CO1	Simulate the principles of process control in industrial applications.
CO2	Design and tune process controllers and PID controllers.
CO3	Determine the performance characteristics of different transducers for calibration.
COURSE NAME	**ROBOTICS PRACTICAL**
COURSE CODE	**34765**
CO1	Acquire hands-on laboratory experience, using robot system components
CO2	Operate and control robot through simulation software.
CO3	Carry out projects on Robotics using sensors and grippers
COURSE NAME	**HYDRAULICS AND PNEUMATICS PRACTICAL**
COURSE CODE	**34746**
CO1	Apply fundamental knowledge of pneumatic and hydraulic systems in selection of components.
CO2	Design hydraulic and pneumatic circuits for various industrial applications.
CO3	Test and troubleshoot pneumatic and hydraulic circuits.
CO4	Develop PLC programs using various functions.
CO5	Relate programming and interfacing of I/O devices with PLC for process automation.
COURSE NAME	**CNC PRACTICAL**

COURSE CODE	**34757**
CO1	Create CNC part programs using standard G codes and M codes
CO2	Produce components by using programs on CNC Machining and Turning Center.
CO3	Apply CAD/CAM techniques to achieve productivity and flexibility in product development process.
VII SEM	
COURSE NAME	**IPT 2**
COURSE CODE	**34792**
CO1	Adopt to the industrial environment, Organization structure with various safety norms practiced in industries
CO2	Practice professional ethics & Team work in interdepartmental environment.
CO3	Handle various tools, material & equipments with multidisciplinary activities
CO4	Practice various elements of TQM for solving simple industrial problems.
CO5	Communicate the outcomes of in-plant training through records, presentations, mini- projects and final projects
COURSE NAME	**PROJECT**
COURSE CODE	**34767**
CO1	Prepare a specification for a project for the investigation/design of a products / system/ service.
CO2	Plan, manage, keep records of review and control a project with specified time constraints using a project time plan and identify resource requirements and external constraints.
CO3	Identify sources of information and carry out an information search by searching, collating and evaluating information from a variety of sources and using a variety of methods, including information technology
CO4	Assess the effects of a range of factors (where appropriate) on the design, implementation and use of a product/system/service. e.g safety, financial, social, environmental and legal.
CO5	Define, explain and develop the principles/theory relevant to a particular study topic Choose, assemble and present appropriate information clearly in the form of a written report. Demonstrate competent execution of the project task.