## Course Outcomes (CO): ENGINEERING GRAPHICS

| | |
|---|---|
| **CO1** | Use of drawing instruments effectively for drawing and dimensioning |
| **CO2** | Explain conventions and methods of engineering drawing |
| **CO3** | Apply concepts of projections of points, lines, planes, solids and section of solids |
| **CO4** | Construct isometric and orthographic views of given objects |

## Course Outcomes (CO) – Energy and Environment Engineering

| | |
|---|---|
| **CO1** | Identify conventional, non conventional energy sources. |
| **CO2** | Know and discuss power consuming and power developing devices for effective utilization and power consumption |
| **CO3** | Identify various sources of air, water pollution and its effects. |
| **CO4** | Know and discuss noise, soil, thermal pollution and Identify solid, biomedical and hazardous waste. |

## Course Outcomes (CO) – BCME

| | |
|---|---|
| **CO1** | Identify conventional, non conventional energy sources. |
| **CO2** | An ability to identify, formulate and solve engineering problems |
| **CO3** | Understand the energy sources and working principle of power plants and apply the knowledge of power plants to diagnose and solve the Engineering problem. |
| **CO4** | . Understand the working principle of IC Engines. |

# Course Outcomes (CO)-Engineering Graphics Lab

**Course Description:**

This course is aimed at introducing the basic of AutoCAD and it application to engineering drawing. It also aims to study engineering drawing instruments, conventions used, method of projections. The concept of projection o point, line, plane, and solid, section of solid, orthographic projection and isometric projection is studied.

At the end of this course, students should be able to

| | |
|---|---|
| CO1 | To know about the software AutoCAD. |
| CO2 | Use of AutoCAD for geometric construction. |
| CO3 | To know the concept of projections of points, lines on AutoCAD. |
| CO4 | To understand the Construction isometric and orthographic on AutoCAD. |

## CourseOutcomes (CO)-W.S. Practice.

| | |
|---|---|
| **CO1** | Build thorough knowledge of various to ols, machines, devices used in engineering practice. |
| **CO2** | Acquire thorough knowledge of carrying out various operations in mechanical engineering workshop |
| **CO3** | Utilize measuring skills gained in workshop practice |
| **CO4** | Acquire "Hands on" training and practice to students for use of various tools, devices and machines. |

## Course Outcomes (CO) – Fluid Mechanics

| | |
|---|---|
| **CO1** | Define fluid, define and calculate various properties of fluid |
| **CO2** | Calculate hydrostatic forces on the plane and curved surfaces and explain stability of floating bodies |
| **CO3** | Explain various types of flow. Calculate acceleration of fluid particles |
| **CO4** | Apply Bernoulli's equation to simple problems in fluid mechanics |
| **CO5** | Explain laminar and turbulent flows on flat plates and through pipes |
| **CO6** | Explain and use dimensional analysis to simple problems in fluid mechanics |
| **CO7** | Understand centrifugal pump. |

## Course Outcomes (CO) – Material Science & Metallurgy

| | |
|---|---|
| **CO1** | Study various crystal structures of materials. |
| **CO2** | Understand mechanical properties of materials and calculations of same using appropriate equations |
| **CO3** | Evaluate phase diagrams of various materials |
| **CO4** | Suggest appropriate heat treatment process for a given application |
| **CO5** | Prepare samples of different materials for metallography. |
| **CO6** | Recommend appropriate NDT technique for a given application |
| **CO7** | Study various Micro Structure of Steel, Cast iron. |

# Course Outcomes (CO)-Thermodynamics

**Course Description:**

This course is aimed at introducing the fundamentals of thermodynamics such as first law of thermodynamic, second law of thermodynamics, entropy and pure substances.

At the end of this course, students should be able to

| | |
|---|---|
| CO1 | Define the terms like system, boundary, properties, equilibrium, work, heat, ideal gas, entropy etc. used in thermodynamics. |
| CO2 | Study different laws of thermodynamics and apply these to simple thermal systems like balloon, piston-cylinder arrangement, compressor, pump, refrigerator, heat exchanger, etc. to study energy balance. |
| CO3 | Study various types of processes like isothermal, adiabatic, etc. considering system with ideal gas and represent them on p-v and T-s planes. |
| CO4 | Apply availability concept to non-flow and steady flow type systems. |
| CO5 | Represent phase diagram of pure substance (steam) on different thermodynamic planes like p-v, T-s, h-s, etc. Show various constant property lines on them. |

## Course Outcomes (CO) – M.D.CAD LAB (S.Y.)

| | |
|---|---|
| **CO1** | Interpret the object with the help of given sectional and orthographic views . |
| **CO2** | Draw sectional view of a given machine component. |
| **CO3** | Draw machine element using keys, cotter, knuckle, bolted and welded joint . |
| **CO4** | Assemble details of any given part. i. e. valve, pump , machine tool part etc.. |
| **CO5** | Represent tolerances and level of surface finish on production drawings . |
| **CO6** | Understand various creating and editing commands in Auto Cad . |

## COURSE OUTCOMES (CO) – FLUID MECHANICS LAB

| | |
|---|---|
| **CO1** | Understand laminar and Turbulent flow and determine Critical Reynolds number using Reynolds Apparatus |
| **CO2** | Verify Bernoulli's theorem |
| **CO3** | Determine pressure drop in flow though pipes and pipe fittings |
| **CO4** | Verify momentum equation using impact of jet apparatus |
| **CO5** | Determine viscosity using viscometer |
| **CO6** | Do calibration of pressure gauges, rotameter |
| **CO7** | Use manometers for pressure measurement |

## Course Outcomes (CO) – Material Science & Metallurgy Lab

| | |
|---|---|
| **CO1** | To Find out Brinell Hardness Number of various Material. |
| **CO2** | To Find out Hardness Number Using Rockwell Hardness test . |
| **CO3** | Find out crack ,Porosity ,Voids Using Magnaflux Test . |
| **CO4** | Student able to find crack ,Porosity Using Dye Penetrant Test |
| **CO5** | Student able to Prepare Specimen for Microscopy |
| **CO6** | Student can Study and drawing of microstructures of plain carbon steels of varying carbon percentage |
| **CO7** | Student can Study and drawing of microstructures of cast irons |

# Course Outcomes (CO)-Theory of Machines-I

**Course Description:**

This course is aimed at introducing the fundamentals of kinematics of mechanisms. The objective of the course is to use the knowledge of inversions of mechanisms & its application in machines.

At the end of this course, students should be able to

| | |
|---|---|
| CO1 | Define basic terminology of kinematics of mechanisms |
| CO2 | Classify planar mechanisms and calculate its degree of freedom |
| CO3 | Perform kinematic analysis of a given mechanism using ICR and RV methods |
| CO4 | Perform kinematic analysis of a given mechanism analytically using vector or complex algebra method |
| CO5 | Perform kinematic analysis of slider crank mechanism using Klein's construction and analytical approach |

# Course Outcomes (CO)-Basic Human Rights

**Course Description:**

This course is aimed at introducing the history of human rights. It also gives information about the various laws related to human right, migrant workers, social justice, education. In addition to this the subject covers various aspects such as social structure, responsibility, environmental issues.At the end of this course, students should be able to

| | |
|---|---|
| CO1 | Understand the history of human rights. |
| CO2 | Learn to respect others caste, religion, region and culture. |
| CO3 | Be aware of their rights as Indian citizen. |
| CO1 | Understand the history of human rights. |
| CO2 | Learn to respect others caste, religion, region and culture. |
| CO3 | Be aware of their rights as Indian citizen. |

## Course Outcomes (CO) – Manufacturing Processes I

| | |
|---|---|
| **CO1** | Analyze and access the use of casting processes in manufacturing and understand the working of various casting processes |
| **CO2** | Understand the basics of metal cutting and working of different types of machine tools. |
| **CO3** | Explain the conventional and advanced metal forming processes and composite fabrication |
| **CO4** | Analyze and access the importance of welding processes in manufacturing and apply knowledge to select appropriate welding process based on the type of industrial application |
| **CO5** | Upon completion of this course, the students can able to apply the different metal removing ,finishing and super finishing and for component production |
| **CO6** | Demonstrate operation such as Turning, Facing, Threading, Knurling and Grooving on Centre Lathe. |
| **CO7** | Select appropriate Manufacturing Processing to manufacture any component. |
| **CO8** | Implement the Knowledge of Gained Subject in Industry |

## Course Outcomes (CO) – Sheet Metal Engineering. (S.Y.)

| | |
|---|---|
| **CO1** | Recognize common manufacturing processes of Sheet Metal Fabrication |
| **CO2** | Understand the principles of design and fabricate of sheet metal products and recognize common material used in the industry |
| **CO3** | Distinguish Shearing, Drawing and Pressing etc. processes |
| **CO4** | Know types of dies and formability |
| **CO5** | Select mechanical or hydraulic presses for the given process |

## Course Outcomes (CO) – Strength of Materials

| | |
|---|---|
| **CO1** | State the basic definitions of fundamental terms such as axial load, eccentric load, stress, strain, E, μ, etc |
| **CO2** | Recognize the stress state (tension, compression, bending, shear, etc.) and calculate the value of stress developed in the component in axial/eccentric static and impact load cases. |
| **CO3** | Distinguish between uniaxial and multiaxial stress situation and calculate principal stresses, max. Shear stress, their planes and max. Normal and shear stresses on a given plane. |
| **CO4** | Analyze given beam for calculations of SF and BM |
| **CO5** | Calculate slope and deflection at a point on cantilever /simply supported beam using double integration, Macaulay's , Area-moment and superposition methods |

# Course Outcomes (CO)-Theory of Machines Lab-I (S.Y.)

**Course Description:**

This course is aimed at demonstrating basic mechanisms and analysis of mechanisms.

At the end of this course, students should be able to

| | |
|---|---|
| CO1 | Perform graphically kinematic analysis of any planar mechanism using ICR and RV methods. |
| CO2 | Perform graphically kinematic analysis of slider crank mechanism using Klein's construction. |
| CO3 | Demonstrate use of graphical differentiation method for kinematic analysis of slider crank mechanism or any other planar mechanism with a slider. |
| CO4 | Sketch polar diagram for a Hooke's joint. |

## CourseOutcomes (CO)-MP I Lab

| | |
|---|---|
| **CO1** | Know the various basic Manufacturing processes used in industry for converting raw materials into finished products. |
| **CO2** | Know the principles and science of various basic manufacturing processes |
| **CO3** | Acquire fundamental knowledge and design widely used and very important primary manufacturing processes such as casting, joining and forming. |
| **CO4** | Acquire knowledge about the various tools, equipment, machinery and operations required for these basic manufacturing processes. |

## CourseOutcomes (CO)- S.O.M. Lab.

| | |
|---|---|
| CO1 | Evaluate Properties of material by impact test. |
| CO2 | Evaluate Properties of material by hardness test |
| CO3 | Evaluate Properties of material by tensile test. |
| CO4 | Evaluate the capacity of a material to withstand torsional stresses for a safe and sustainable design of machine elements. |

# CourseOutcomes (CO)-Automobile Engineering Sem-I 22-23

**Course Description:**

- ✓ This course is aimed at introducing the fundamentals of Automobile Engineering to undergraduate students. The objective of the course is to use the Knowledge of Automobile in real life applications. Classroom and Lab sessions focuses on writing efficient, maintainable, and portable code.

  At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Identify the different parts of the automobile. |
| **CO2** | Explain the working of various parts like engine, transmission, clutch, brakes etc., |
| **CO3** | Demonstrate various types of drive systems. |
| **CO4** | Apply vehicle troubleshooting and maintenance procedures. |
| **CO5** | Analyze the environmental implications of automobile emissions. And suggest suitable regulatory modifications. |
| **CO6** | Evaluate future developments in the automobile technology. |

# Course Outcomes (CO)-Theory of Machines-II (T.Y.)

**Course Description:**

This course is aimed at introducing the fundamentals of machines & mechanisms. The objective of the course is to use the knowledge of concepts of gear, belt, chain, governor, gyroscope, flywheels and vibration reduction in real life applications such as aeroplanes, ships, machines etc.

At the end of this course, students should be able to

| | |
|---|---|
| CO1 | Identify and select type of belt and rope drive for a particular application |
| CO2 | Evaluate gear tooth geometry and select appropriate gears, gear trains |
| CO3 | Define governor and select/suggest an appropriate governor |
| CO4 | Characterize flywheels as per engine requirement |
| CO5 | Understand gyroscopic effects in ships, aeroplanes, and road vehicles. |
| CO6 | Understand free and forced vibrations of single degree freedom systems |

## Course Outcomes (CO) – R.E.S. (T.Y.)

| | |
|---|---|
| **CO1** | Explain the difference between renewable and non renewable energy. |
| **CO2** | Describe working of solar collectors. |
| **CO3** | Explain various applications of solar energy. |
| **CO4** | Describe working of other renewable energies such as wind, biomass |
| **CO5** | Understand the concept of other renewable energy sources like Tidal energy, Geo thermal energy, OTCE, Nuclear energy and Hydro-electric energy. |

## Course Outcomes (CO) – Heat Transfer

| | |
|---|---|
| **CO1** | Explain the laws of heat transfer and deduce the general heat conduction equation and to explain it for 1-D steady state heat transfer in regular shape bodies |
| **CO2** | Describe the critical radius of insulation, overall heat transfer coefficient, thermal conductivity and lumped heat transfer |
| **CO3** | Interpret the extended surfaces |
| **CO4** | Illustrate the boundary layer concept, dimensional analysis, forced and free convection under different conditions |
| **CO5** | Describe the Boiling heat transfer, Evaluate the heat exchanger and examine the LMTD and NTU methods applied to engineering problems |
| **CO6** | Explain the thermal radiation black body, emissivity and reflectivity and evaluation of view factor and radiation shields |

## Course Outcomes (CO) –AT

| | |
|---|---|
| **CO1** | Define the terms like calorific value of fuel, stoichiometric air-fuel ratio, excess air, equivalent evaporation, boiler efficiency, etc. Calculate minimum air required for combustion of fuel. |
| **CO2** | Study and Analyze gas power cycles and vapor power cycles like Joule cycle and Rankine cycle and derive expressions for the performance parameters like thermal efficiency, Pm |
| **CO3** | Classify various types of boilers, nozzle, steam turbine and condenser used in steam power plant. |
| **CO4** | Draw P-v diagram for single-stage reciprocating air compressor, with and without clearance volume, and evaluate its performance. Differentiate between reciprocating and rotary air compressors. |

# CourseOutcomes (CO)-Machine Design-I

**Course Description:**

- ✓ This course is aimed at introducing the fundamentals of Machine Design-I to undergraduate students. The objective of the course is to use the Knowledgeof Machine Design in real life applications. Classroom and Lab sessions focuses on writing efficient, maintainable, and portable code.

  At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Formulate the problem by identifying customer need and convert into design specification |
| **CO2** | Understand component behavior subjected to loads and identify failure criteria |
| **CO3** | Analyze the stresses and strain induced in the component |
| **CO4** | Design of machine component using theories of failures |
| **CO5** | Design of component for finite life and infinite life when subjected to fluctuating load |
| **CO6** | Design of components like shaft, key, coupling, screw and spring |

# Course Outcomes (CO)-Theory of Machines Lab-II (T.Y.)

**Course Description:**

This course is aimed at demonstrating basic machine elements & mechanisms.

At the end of this course, students should be able to

| | |
|---|---|
| CO1 | Identify and select type of belt and rope drive for a particular application |
| CO2 | Evaluate gear tooth geometry and select appropriate gears, gear trains |
| CO3 | Define governor and select/suggest an appropriate governor |
| CO4 | Characterize flywheels as per engine requirement |

# Course Outcomes (CO)-Heat Transfer Lab

**Course Description:**

This course demonstrates the various heat transfer methods. It also demonstrates it through experiments and analysis of the data. At the end of the course, students will be able to-

| | |
|---|---|
| CO1 | Understand the various heat transfer mode of heat transfer and its application and verify |
| CO2 | Learn the experimental methodology |
| CO3 | Describe the concept the terms like least count, calibration of the instruments |

## CourseOutcomes (CO)- M.D - I Lab.

| | |
|---|---|
| CO1 | To understand procedure of machine design and develop an ability to apply it for simple component design by using design data hand book |
| CO2 | To understand the different theories of failure and develop an ability to apply its knowledge for design of mechanical component and determine the resisting areas against failure. |
| CO3 | To determine forces on transmission shaft and design of transmission shaft |
| CO4 | To determine the endurance strength and design of components subjected to fluctuating loads |
| CO5 | To determine the forces in welds and riveted joints and formulate design solution for size of weld and size of rivet. |

# Course Outcomes (CO)-Manufacturing Processes-II

**Course Description:**

This course is aimed at making the students aware about the different manufacturing processes. The course includes the basic principles & applications of abrasive machining, powder metallurgy, processing of ceramics, plastics & glass. It also imparts knowledge of theory of cutting tool, tool life, machinablity.

| | |
|---|---|
| CO1 | Understand the process of powder metallurgy and its applications |
| CO2 | Calculate the cutting forces in orthogonal and oblique cutting |
| CO3 | Evaluate the machinability of materials |
| CO4 | Understand the abrasive processes |
| CO5 | Explain the different precision machining processes |
| CO6 | Design jigs and fixtures for given application |

# Course Outcomes (CO)-Machine Design-II SEM-II 22-23

**Course Description:**

- ✓ This course is aimed at introducing the fundamentals of Machine Design-II to undergraduate students. The objective of the course is to use the Knowledgeof Machine Design in real life applications. Classroom and Lab sessions focuses on writing efficient, maintainable, and portable code.

  At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Define function of bearing and classify bearings. |
| **CO2** | Understanding failure of bearing and their influence on its selection. |
| **CO3** | Classify the friction clutches and brakes and decide the torque capacity and friction disk parameter. |
| **CO4** | Select materials and configuration for machine element like gears, belts and chain |
| **CO5** | Design of elements like gears, belts and chain for given power rating |
| **CO6** | Design thickness of pressure vessel using thick and thin criteria |

## Course Outcomes (CO) – Internal Combustion Engines

| | |
|---|---|
| **CO1** | Understand various types of I.C. Engines and Cycles of operation. |
| **CO2** | Analyze the effect of various operating variables on engine performance |
| **CO3** | Identify fuel metering and fuel supply systems for different types of engines |
| **CO4** | Understand normal and abnormal combustion phenomena in SI and CI engines |
| **CO5** | Evaluate performance Analysis of IC Engine and Justify the suitability of IC Engine for different application |
| **CO6** | Understand the conventional and non-conventional fuels for IC engines and effects of emission formation of IC engines, its effects and the legislation standards |

## Course Outcomes (CO) – Product life Cycle Management. (T.Y.)

| | |
|---|---|
| **CO1** | Outline the concept of PLM. |
| **CO2** | Illustrate the PDM system and its importance |
| **CO3** | Illustrate the product design process |
| **CO4** | Build the procedure for new product development |
| **CO5** | Classify and compare various technology forecasting methods |
| **CO6** | Outline the stages involved in PLM for a given product |

## Course Outcomes (CO) –QTPM

| | |
|---|---|
| **CO1** | Define and formulate research models to solve real life problems for allocating limited resources by linear programming. |
| **CO2** | Apply transportation and assignment models to real life situations |
| **CO3** | Apply queuing theory for performance evaluation of engineering and management systems. |
| **CO4** | Apply the mathematical tool for decision making regarding replacement of items in real life. |
| **CO5** | Determine the EOQ, ROP and safety stock for different inventory models. |
| **CO6** | Construct a project network and apply CPM and PERT method |

# CourseOutcomes (CO)-Manufacturing Processes-II LAB

**Course Description:**

- ✓ This course is aimed at introducing the fundamentals of Manufacturing Processes to undergraduate students. The objective of the course is to use the Manufacturing ProcessesKnowledge in real life applications. Classroom and Lab sessions focuses on writing efficient, maintainable, and portable code.

  At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Upon Completion of this course the students can be able to understand &compare the functions & application of different metal cutting tools. |
| **CO2** | Learn operations in metal cutting processes. |
| **CO3** | To demonstrate the programming in CNC machining. |
| **CO4** | Upon completion of this course the students can able to apply the different metal removing ,finishing for component production |
| **CO5** | Learn various cutting tool operations using CNC Machine. |
| **CO6** | Upon completion of this course the students can able to understand & compare the process. |

# CourseOutcomes (CO)-Machine Design-II LAB sem-II 22-23

**Course Description:**

- ✓ This course is aimed at introducing the fundamentals of Machine Design-II to undergraduate students. The objective of the course is to use the Knowledgeof Machine Design in real life applications. Classroom and Lab sessions focuses on writing efficient, maintainable, and portable code.

  At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Apply design process to an open ended problems. |
| **CO2** | Determine suitable material and size for structural component of machine/system. |
| **CO3** | Apply iterative technique in design including making estimate of unknown values for first computation and checking or revisiting and re-computing. |
| **CO4** | Choose logically and defend selection of design factors. |
| **CO5** | Design of components for given part/system i.e shaft, keys, coupling, links, screws, springs etc. |
| **CO6** | Work effectively as a part of design group/team. Have good communication skill, orally, graphically as well as in writing. |

## CourseOutcomes (CO)- I.C. Engine Lab.

| | |
|---|---|
| CO1 | Understand the practical operation of 2 stroke and 4 stroke I.C engines using valve timing diagram |
| CO2 | Analyze the performance of multi cylinder engines with the variation of various performances like load and speed. |
| CO3 | Determine the quality of Engine fuels by analyzing its calorific value |
| CO4 | Estimate the constituents of combustion products for emission characteristics related to public safety. |
| CO5 | Understand the concept of cooling Systems in I.C. Engine. |

## Course Outcomes (CO) – Mechatronics

| | |
|---|---|
| **CO1** | Define sensor, transducer and understand the applications of different sensors and transducers |
| **CO2** | Explain the signal conditioning and data representation techniques |
| **CO3** | Design pneumatic and hydraulic circuits for a given application |
| **CO4** | Write a PLC program using Ladder logic for a given application |
| **CO5** | Understand applications of microprocessor and micro controller |
| **CO6** | Analyse PI, PD and PID controllers for a given application |

# Course Outcomes (CO)-CAD/CAM

**Course Description:**

This course is aimed at introducing the fundamentals of computer aided design and computer aided manufacturing.. The objective of the course is to use the knowledge of CAD/CAM in the design and manufacturing of products in real life applications.

At the end of this course, students should be able to

| | |
|---|---|
| CO1 | List and describe the various input and output devices for a CAD work station |
| CO2 | Carry out/calculate the 2-D and 3-D transformation positions (Solve problems on 2-Dand 3-D transformations) |
| CO3 | Describe various CAD modeling techniques with their relative advantages and limitations |
| CO4 | Describe various CAD modeling techniques with their relative advantages and limitations |
| CO5 | Develop NC part program for the given component, and robotic tasks |
| CO6 | Describe the basic Finite Element procedure |
| CO7 | Explain various components of a typical FMS system, Robotics, and CIM |
| CO8 | Classify parts in part families for GT |
| CO9 | Describe and differentiate the CAPP systems |

# CourseOutcomes (CO)-Manufacturing Processes-III- Sem-I 22-23

**Course Description:**

- ✓ This course is aimed at introducing the fundamentals of Mechanical engineering to undergraduate students. The objective of the course is to use the Mechanical Engineering Knowlegde in real life applications. Classroom and Lab sessions focuses on writing efficient, maintainable, and portable code.

  At the end of this course, students should be able to

| | |
|---|---|
| **CO1** | Differentiate clearly between NC and CNC machines |
| **CO2** | Prepare and execute a part program for producing a given product |
| **CO3** | Select appropriate non-traditional machining process for a given application |
| **CO4** | Compare different surface coating techniques |
| **CO5** | Explain different rapid prototyping techniques |
| **CO6** | Illustrate the working principle of various micro-manufacturing processes |

## Course Outcomes (CO) –R.A.C.

| | |
|---|---|
| **CO1** | To understand the concept of refrigeration |
| **CO2** | Define various air properties and psychrometric processes |
| **CO3** | Explain various air conditioning systems. |
| **CO4** | Explain various air cooling systems. |
| **C05** | To acquire knowledge of methods of refrigeration. |

## Course Outcomes (CO) – Knowledge Management. (Final Year)

| | |
|---|---|
| **CO1** | Gain the knowledge and skills relevant to a career as a professional engineering manager who can work effectively with current and future industrial technologies, methods and standards . |
| **CO2** | Stundents focuses on how Knowledge Management (KM) and a range of Information Technologies and analysis techniques are used to support KM initiatives in organisations |
| **CO3** | Students should develop analytical skills to understand the complexity of real-world KM work in organisations. |
| **CO4** | It promotes innovative thinking around the deployment of existing and emerging information technologies for KM. |
| **CO5** | The subject contributes to the development of independent critical inquiry, analysis and reflection. |
| **CO6** | Acquire understanding of the innovative and pioneering approaches in engineering management field and to be able to apply them to the solution of real-world problems to develop new industrially-relevant solutions |
| **CO7** | Be able to apply and integrate knowledge and understanding of other engineering and non-engineering disciplines to support engineering activities. |

## Course Outcomes (CO) – Mechatronics Lab

| | |
|---|---|
| **CO1** | Understand the various types of sensors and their applications |
| **CO2** | Design a pneumatic circuit for a given application |
| **CO3** | Design a hydraulic circuit for a given application |
| **CO4** | Write a PLC program using Ladder logic |
| **CO5** | Experiment PID controller for controlling temperature |
| **CO6** | Demonstrate the capacitance sensor for measuring level |

# Course Outcomes (CO)-CAD/CAM Lab

**Course Description:**

This course is aimed at introducing the fundamentals of computer aided design and computer aided manufacturing. The objective of the course is to gain the knowledge of CAD software for the design engineering as well as instruction about CNC programming & application of robot.

At the end of this course, students should be able to

| | |
|---|---|
| CO1 | Construct CAD part models, assembly model and drafting of machine elements using CAD software. |
| CO2 | Evaluate stresses in components subjected to simple structural loading using FE software |
| CO3 | Write NC programs for turning and milling |
| CO4 | Describe case study of industrial robots |