

**K.L.N. College of Engineering**  
**Department of Mechanical Engineering**  
**Course Outcomes**  
**Autonomous Curriculum Regulation 2020**

Course Name: 20GE1L2-Industrial Practices Workshop	
CO	COURSE OUTCOMES
<b>C108.1</b>	Prepare different carpentry joints.
<b>C108.2</b>	Prepare pipe connections with different joints for domestic applications.
<b>C108.3</b>	Make the models using sheet metal works.
<b>C108.4</b>	Carry out the basic machining operations.
<b>C108.5</b>	Prepare joints using welding equipment s.
<b>C108.6</b>	Demonstrate on gas welding, refrigeration and air conditioning processes.
<b>C108.7</b>	Carry out basic home electrical works and appliances.
<b>C108.8</b>	Measure the electrical quantities.
<b>C108.9</b>	Elaborate on the components, gates, soldering practices.

Course Name: 20GE201-Engineering Graphics	
CO	COURSE OUTCOMES
<b>C112.1</b>	Familiarize with the fundamentals and standards of Engineering graphics.
<b>C112.2</b>	Draw the orthographic projections of points, lines and planes.
<b>C112.3</b>	Draw the projections of simple solids like prisms, pyramids, cylinder and cone.
<b>C112.4</b>	Draw the projections of sectional views of solids and develop its lateral surfaces.

<b>C112.5</b>	Draw the isometric projection of simple objects, truncated prism and pyramids.
<b>C112.6</b>	Draw the free hand sketching of simple objects.

Course Name: 20GE202-Engineering Mechanics	
<b>CO</b>	<b>COURSE OUTCOMES</b>
<b>C113.1</b>	Illustrate the vectorial and scalar representation of forces and moments.
<b>C113.2</b>	Solve problems in engineering systems using the concept of static equilibrium
<b>C113.3</b>	Draw free body diagram and apply equilibrium principles for two dimensional rigid bodies.
<b>C113.4</b>	Determine the centroid and moment of inertia of plane lamina.
<b>C113.5</b>	Apply fundamental principles to solve problems in dynamics of particles.
<b>C113.6</b>	Summarize the basic principles of friction and general plane motion

Course Name: 20ME301- Strength of Materials	
<b>CO</b>	<b>COURSE OUTCOMES</b>
<b>C202.1</b>	Explain the fundamental concepts of stress and strain
<b>C202.2</b>	Determine the deformation of bars while applying loads
<b>C202.3</b>	Compute stresses due to internal pressure in cylinders and spherical shells
<b>C202.4</b>	Apply basic equation of simple torsion in designing of shafts and helical springs
<b>C202.5</b>	Construct Shear force diagram, Bending moment diagram for different beam configurations with combination of transverse loading
<b>C202.6</b>	Calculate the deflection in beams by various methods and crippling load of columns under various conditions.

Course Name: 20ME302- Fluid Mechanics and Machinery	
CO	COURSE OUTCOMES
C203.1	Determine the effect of fluid properties on a flow system
C203.2	Apply the kinematic concepts and dynamic concepts which relates to the conservation principles of mass and energy
C203.3	Compute loses in pipes, bends and fittings using conservation laws.
C203.4	Use dimensional analysis to design physical or numerical experiments and to apply dynamic similarity
C203.5	Analyze the performance of hydraulic turbines.
C203.6	Analyze the performance of pumps

Course Name: 20ME303- Manufacturing Processes	
CO	COURSE OUTCOMES
C204.1	Identify defects and interpret causes for defects in product of metal casting processes.
C204.2	Select the suitable metal joining process for a given product or component.
C204.3	Determine the power required for bulk deformation process.
C204.4	Determine the power required for shearing, bending and deep drawing.
C204.5	Explain the steps involved in manufacturing of parts by powder metallurgy.
C204.6	Choose a suitable plastic molding process and additive manufacturing process for producing a given part

Course Name: 20ME3034- ENGINEERING THERMODYNAMICS	
CO	COURSE OUTCOMES
C205.1	Apply first law of thermodynamics and determine energy exchange in closed systems and flow process
C205.2	Apply second law of thermodynamics to determine the performance limits of thermodynamic cycles

<b>C205.3</b>	Determine thermodynamic properties of pure substances
<b>C205.4</b>	Calculate efficiency of simple and improved Rankine cycle
<b>C205.5</b>	Derive simple thermodynamic relations of ideal gases
<b>C205.6</b>	Calculate properties of gas mixtures and moist air using thermodynamic relations and psychrometric chart.

Course Name: 20HS301- UNIVERSAL HUMAN VALUES	
<b>CO</b>	<b>COURSE OUTCOMES</b>
<b>C206.1</b>	Explain the significance of value inputs in a classroom and start applying them in their life and profession.
<b>C206.2</b>	Distinguish between Values and Skills to ensure happiness and prosperity.
<b>C206.3</b>	Distinguish between Thyself and the Body to ensure competency of an individual.
<b>C206.4</b>	Explain the role of a human being in ensuring harmony in society and nature.
<b>C206.5</b>	Distinguish between ethical and unethical practices, and apply suitable strategy to actualize a harmonious working environment.
<b>C206.6</b>	Develop an awareness of human values to appreciate the rights of others.

Course Name: 20ME3L1-Strength of Materials Laboratory	
<b>CO</b>	<b>COURSE OUTCOMES</b>
<b>C207.1</b>	Explain the concept of determining stresses and strains from the member forces.
<b>C207.2</b>	Apply the basic concepts and effects of axial loads, shear, and torsion on structural components.
<b>C207.3</b>	Determine the young's modulus of beams by means of deflection of beam experiments.
<b>C207.4</b>	Calculate the hardness of different materials by means of Brinell and Rockwell hardness experiments.
<b>C207.5</b>	Calculate the modulus of rigidity and stiffness of spring by means of open coil and closed coil experiments.

<b>C207.6</b>	Calculate the hardness and Physical insight into the behavior materials by means of hardening and tempering experiments.
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Course Name: 20ME3L2-FUID MECHANICS AND MACHINERY LABORATORY	
CO	COURSE OUTCOMES
<b>C208.1</b>	Determine the coefficient of discharge for Orifice meter and Venturimeter
<b>C208.2</b>	Determine the rate of flow using Rota meter and calibrate it
<b>C208.3</b>	Predict performance characteristics of centrifugal pump and submergible pump.
<b>C208.4</b>	Predict performance characteristics of reciprocating pump and gear pump.
<b>C208.5</b>	Predict performance characteristics of turbines.
<b>C208.6</b>	Determine the friction factor for flow through pipes.

Course Name: 20ME401-Kinematics of Machines	
CO	COURSE OUTCOMES
<b>C210.1</b>	Calculate the degrees of freedom in simple kinematics chain
<b>C210.2</b>	Determine the velocity and acceleration for simple mechanisms
<b>C210.3</b>	Develop the cam profile for various type of followers
<b>C210.4</b>	Determine the speed and contact ratio of gear pair and gear trains
<b>C210.5</b>	Determine the tooth load and torque in gear trains
<b>C210.6</b>	Determine the friction of various machine elements

Course Name: 20ME402- Manufacturing Technology	
CO	COURSE OUTCOMES

<b>C211.1</b>	Calculate the cutting forces in orthogonal cutting and cutting tool life.
<b>C211.2</b>	Develop process sheet for machining operation of a given part in turning machine.
<b>C211.3</b>	Calculate the machining time for producing components in shaper, drilling and milling
<b>C211.4</b>	Identify and select suitable abrasive process for producing a given product and explain the process in detail.
<b>C211.5</b>	Explain the constructional features and working principles of NC/CNC machine tools
<b>C211.6</b>	Develop CNC program for the given part.

Course Name: 20ME403- Thermal Engineering	
<b>CO</b>	<b>COURSE OUTCOMES</b>
<b>C212.1</b>	Explain the working of IC engines
<b>C212.2</b>	Calculate efficiency of gas power cycles
<b>C212.3</b>	Determine the performance Parameters of IC Engines
<b>C212.4</b>	Calculate performance of refrigeration cycles
<b>C212.5</b>	Determine cooling load using Psychrometric chart
<b>C212.6</b>	Determine the performance of Reciprocating Air Compressors

Course Name: 20HS401- ENVIRONMENTAL SCIENCE AND ENGINEERING	
<b>CO</b>	<b>COURSE OUTCOMES</b>
<b>C213.1</b>	Describe the environment, ecosystem and their significances.
<b>C213.2</b>	Identify the threats to biodiversity and methods to conserve biodiversity.
<b>C213.3</b>	Identify and implement technological and economical solution to environmental pollution.

<b>C213.4</b>	Develop the knowledge on various natural resources and effect on environment due to over utilization.
<b>C213.5</b>	Record the consequences of natural disasters.
<b>C213.6</b>	Outline the social issues such as welfare, sustainability etc., and to relate with population growth.

Course Name: 20ME404- Metrology and Measurement Practices	
<b>CO</b>	<b>COURSE OUTCOMES</b>
<b>C214.1</b>	Design tolerances and fits for a selected product quality.
<b>C214.2</b>	Select a suitable comparator/ angular measuring device for inspecting the products in a given industry.
<b>C214.3</b>	Choose appropriate method and instruments for inspection of various forms.
<b>C214.4</b>	Select suitable advanced measuring instruments for special requirement in the industries.
<b>C214.5</b>	Choose appropriate method for the measurement of power, flow for a given application.
<b>C214.6</b>	Conduct experiments on various dimensional/physical measuring instruments and determine the parameters like diameter, angle, straightness, force, temperature,

Course Name: 20ME4L1- Manufacturing Technology Laboratory	
<b>CO</b>	<b>COURSE OUTCOMES</b>
<b>C215.1</b>	Perform various operations in Lathe.
<b>C215.2</b>	Perform shaping, drilling and milling operations.
<b>C215.3</b>	Generate gear profile using milling, gear hobbing and gear shaping machines.
<b>C215.4</b>	Use grinding machine for surface finishing operations on simple parts.
<b>C215.5</b>	Calculate cutting forces using cutting tool dynamometer in Turning/ Milling Process.
<b>C215.6</b>	Develop CNC programming for the simple components produced in CNC lathe and CNC milling.

Course Name: 20ME4L2- Thermal Engineering Laboratory

<b>CO</b>	<b>COURSE OUTCOMES</b>
<b>C216.1</b>	Conduct tests on I.C Engine – 2 stroke and 4 stroke model and Calculate Valve Timing and Port Timing Values.
<b>C216.2</b>	Conduct tests on Flash and Fire Point apparatus and determine the value of Flash and Fire Point of fossil fuels and Lubricants.
<b>C216.3</b>	Conduct Performance tests on Diesel and Petrol engine Test rigs and analyze the performance Parameters of different engines.
<b>C216.4</b>	Conduct tests on refrigeration test rigs and determine the COP of refrigeration test rigs.
<b>C216.5</b>	Conduct tests on air conditioning test rigs and determine the COP of air conditioning test rigs.
<b>C216.6</b>	Conduct tests on reciprocating air compressor test rigs and determine the volumetric efficiency of reciprocating air compressor test rigs.