

K D Polytechnic, Patan
Mechanical Engineering Department

Table of Subjects offered in Diploma Mechanical Engineering with its Course Outcome
W.E.F. 2021-22 term

Subject Code	Name of Subject	Course Outcome Statement	
SEM-1			
4300001	Mathematics	CO-1	Interpret the function graphically, numerically and analytically.
		CO-2	Demonstrate the ability to algebraically analyse basic functions used in Trigonometry.
		CO-3	Demonstrate the ability to Crack engineering related problems based on concepts of Vectors
		CO-4	Solve basic engineering problems under given conditions of straight lines and circle
		CO-5	Demonstrate the ability to analyze and illustrate the Functions using the concept of Limit.
4300002	Communication Skills in English	CO-1	Use strategies to minimise barriers of effective communication.
		CO-2	Construct grammatically correct sentences.
		CO-3	Develop reading and listening skills in terms of fluency and comprehensibility.
		CO-4	Compose different types of written communication.
		CO-5	Communicate orally in a given situation with a purpose.
4300004	Applied Physics	CO-1	Use relevant instruments with precision to measure the dimension of given physical quantities in various engineering situations.
		CO-2	Solve various engineering problems by the concept of linear momentum and circular motion.
		CO-3	Apply basic concepts of properties of matter in solving engineering problems efficiently.
		CO-4	Apply the basic concepts of heat transfer and thermometric properties to provide solutions for various engineering problems.
		CO-5	Use the concept of waves and sound waves for various acoustics and other engineering applications involving wave dynamics.
4300007	Engineering Drawing	CO-1	Use scales, drawing standards and drafting instruments as per BIS codes.
		CO-2	Construct polygons, circles and lines with different geometric conditions.
		CO-3	Construct engineering curves as per given dimensions.
		CO-4	Draw the projection of points, lines and planes under different conditions.
		CO-5	Draw orthographic views from isometric views of simple objects and vice versa.

Subject Code	Name of Subject	Course Outcome Statement	
4300015	Sports and Yoga	CO-1	Practice physical activities and yoga for strength, flexibility and relaxation.
		CO-2	Use techniques for increasing concentration and decreasing anxiety for stronger academic performance.
		CO-3	Perform yoga exercises in various combination and forms.
		CO-4	Improve personal fitness through participation in sports and yoga activities.
		CO-5	Follow sound nutritional practices for maintaining good health and physical performance.
4301901	Engineering Workshop Practice	CO-1	Use the preliminary safety measures while working in different shops of engineering workshop.
		CO-2	Select the appropriate tools/equipment required for specific job.
		CO-3	Perform various fitting and sheet metal operations to produce simple jobs.
		CO-4	Use various tools for performing plumbing and carpentry operations.
		CO-5	Perform various joining operations using welding, brazing and soldering methods.
4310001	Basics of Civil Engineering	CO-1	Prepare drawing from field Survey data using Chain, Tape, Compass and /or Dumpy level.
		CO-2	Select suitable building material and construction technique.
		CO-3	Interpret various building drawing and Services.
		CO-4	Follow traffic control aids.
		CO-5	Use green and ecofriendly building technology.
SEM-2			
4300003	Environment and Sustainability	CO-1	Adopt relevant ecofriendly product in the given situation to protect ecosystem
		CO-2	use relevant method of pollution reduction in the given situation
		CO-3	Use of renewable resources of energy for sustainable development
		CO-4	Use the relevant techniques in given context to reduce impact due to climate change
		CO-5	Use relevant laws and policies for developing the sustainable environmental development
4300008	Engineering Mechanics	CO-1	Identify the force systems for given conditions by applying the basics of mechanics.
		CO-2	Determine unknown force(s) of different engineering systems.
		CO-3	Find the centroid and centre of gravity of various components in engineering Systems.
		CO-4	Apply the principles of friction in various conditions for useful purposes.
		CO-5	Select the eco-friendly relevant simple lifting machine(s) for given purposes.

Subject Code	Name of Subject	Course Outcome Statement	
4300014	Basics of Electrical and Electronic Engineering	CO-1	Apply fundamentals of DC circuits and batteries in relevant engineering discipline.
		CO-2	Apply fundamental of AC circuits in relevant engineering discipline.
		CO-3	Use electrical and electronics instruments for measuring various parameters.
		CO-4	Distinguish various electrical machines based on their working and applications.
		CO-5	Classify green energy sources with emphasis on working of solar and wind power plant.
4300016	Indian Constitution	CO-1	List salient features and characteristics of the constitution of India.
		CO-2	Follow fundamental responsibilities, privileges, rights and duties as responsible citizen and engineer of the country.
		CO-3	Differentiate between state and central administrative setup of the country.
		CO-4	Explain major constitutional amendment procedures and emergency provisions in the country
		CO-5	Explain judicial setup and electoral process of the country.
4300019	Computer Applications and Graphics	CO-1	Utilize various computer hardware, peripheral devices and software tools.
		CO-2	Create professional documents, analyzing data and presentation using various IT software tools.
		CO-3	Interpret cyber security in use of internet services for various applications.
		CO-4	Draw simple Mechanical components/assembly in 2D using CAD software.
4320001	Applied Mathematics	CO-1	Demonstrate the ability to Crack engineering related problems based on Matrices.
		CO-2	Demonstrate the ability to solve engineering related problems based on applications of differentiation.
		CO-3	Demonstrate the ability to solve engineering related problems based on applications of integration.
		CO-4	Develop the ability to apply differential equations to significant applied problems.
		CO-5	Solve applied problems using the concept of mean.
4321902	Mechanical Drafting	CO-1	Prepare sectional orthographic views of complex mechanical parts as perASME Y14-32003 standard.
		CO-2	Draw lines/curves of intersection of pipe lines and ducts like solid.
		CO-3	Develop the lateral surface of given combination of solid.
		CO-4	Apply Geometric Dimensioning and Tolerancing (GD&T)to machine parts in a manner that complies with the ASME Y14.5-2009 standard.
		CO-5	Prepare assembly and detail drawing of various mechanical components.

Subject Code	Name of Subject	Course Outcome Statement	
SEM-3			
4300020	Engineering Material	CO-1	Compare appropriate material for manufacturing various components.
		CO-2	Explain appropriate heat treatment process for various components.
		CO-3	Describe various metal and its alloys based on composition and properties.
		CO-4	Understand classification and properties of non-metallic materials and composites,
		CO-5	Explain electrolysis, paints and powder material to improve surface properties.
		CO-6	Identify green material as an alternative of existing materials.
4330001	Summer Internship-I	CO-1	Learn and adopt the engineer's role and responsibilities with ethics.
		CO-2	Get exposure to the industrial environment for professional activities.
		CO-3	Get possible opportunities to learn, understand and sharpen the technical skills required for technical advancement.
		CO-4	Develop managerial skills required for professional career.
		CO-5	Attain skill for writing technical report and prepare poster for presentation.
4331901	Theory Of Machines And Mechanisms	CO-1	Understand Kinematics and Dynamics of different machines and mechanisms.
		CO-2	Understand different types of Cams and their motions along with the drawing ability of Cam profiles for various motions.
		CO-3	Justify the role of Flywheel, Governor, Brakes, Bearings and Clutches along with selection of suitable drives in Mechanical applications.
		CO-4	Appreciate concept of balancing and vibrations.
4331902	Engineering Thermodynamics	CO-1	Identify thermodynamic properties and systems by interpreting the basic concepts of thermodynamics.
		CO-2	Apply various thermodynamic laws and gas laws to thermal systems.
		CO-3	Calculate various parameters of different thermodynamic processes and cycles using P-V and T-s diagrams.
4331903	Manufacturing Engineering-I	CO-1	Classify various mechanical manufacturing processes.
		CO-2	Select appropriate metal working processes to produce mechanical components.
		CO-3	Select appropriate casting processes to produce mechanical components.
		CO-4	Select moulding methods suitable for non-metal components.
		CO-5	Select metal joining methods for various applications.

Subject Code	Name of Subject	Course Outcome Statement	
4331904	Strength Of Materials	CO-1	Analyse structural behaviour of various materials under axial loading.
		CO-2	Determine moment of inertia of a symmetrical and asymmetrical section about a given axis.
		CO-3	Draw and Interpret shear force and bending moment diagrams and determine the bending and shear stresses in beams for various types and loading conditions.
		CO-4	Determine slope and deflection in cantilever and simply supported beams.
		CO-5	Determine stresses in the shaft and springs under twisting moments.
		CO-6	Select suitable material(s) for given purposes in engineering.
4331905	Computer Aided Machine Drawing Practice	CO-1	Interpret and Draw, edit and modify 2D Production drawing/Machine Drawing of mechanical Components
		CO-2	Create detailed drawings of various machine parts with sectional or plain elevations, plans, side views and dimensioning with bill of materials using (BOM) using CAD software like AutoCAD.
		CO-3	Prepare a report of mechanical components with Sketch of components at each step with dimensions and sequence of commands with name, options and values.
		CO-4	Create various parametric drawings of mechanical components with company logo, tolerances and level of surface finish by using latest parametric CAD software.
		CO-5	Create given project drawings with orthographic projection, bill of material and report using CAD software.
SEM-4			
4340002	Contributor Personality Development	CO-1	Students are able to recognize the work ideal of a Contributor in terms of their motives for working and approach to work. They appreciate the value and importance of becoming Contributors in today's context.
		CO-2	Students are able to recognize & appreciate a "caged" approach as distinct from a "creator" approach in the way people deal with challenges and situations; and learn ways to develop a creator approach.
		CO-3	Students are able to recognize an "I Can" approach or way of thinking in situations. They learn how to apply this thinking to systematically develop themselves and their selfconfidence in any area they choose.
		CO-4	Students are able to widen their understanding of success, that will help them make more sustainable career choices.
		CO-5	Students are able to recognize & appreciate different career development pathways and their value; to open up different career possibilities for themselves.
		CO-6	Students are able to recognize that any role has the potential for contribution. And they learn how to systematically expand the contributions and impact they can make in any role.

Subject Code	Name of Subject	Course Outcome Statement	
4341901	Estimating, Costing and Engineering Contracting	CO-1	Understand the concept of estimation, costing and depreciation.
		CO-2	Apply break even analysis to get optimum production level.
		CO-3	Estimate cost for various conventional manufacturing processes.
		CO-4	Estimate the cost of special process plant.
		CO-5	Prepare budgets and engineering contracts related to mechanical domain.
4341902	Measurements and Metrology	CO-1	Measure the given mechanical elements and assemblies using appropriate linear and angular measuring instruments.
		CO-2	Measure geometrical tolerances and surface roughness of given components.
		CO-3	Measure important dimensions of different types of gears and threads.
		CO-4	Use appropriate limit gauges, transducers and sensors for given applications.
		CO-5	Use appropriate temperature and pressure measuring devices for given application.
4341903	Fluid Mechanics and Hydraulic Machinery	CO-1	Identify fluid properties and their effect on the flow system.
		CO-2	Apply various laws of fluid mechanics to various real-life applications.
		CO-3	Estimate various flow losses to select suitable pipe as per the given situation.
		CO-4	Select a hydraulic machine for a particular application.
4341904	Manufacturing Engineering - II	CO-1	Describe mechanics of cutting, calculate cutting parameters & its effects
		CO-2	Demonstrate working of basic machine tools with kinematics.
		CO-3	Select appropriate grinding processes, grinding machine, grinding wheels.
		CO-4	Select tool and tool holder.
		CO-5	Identify the machine tool, able to operate machine tool and select cutting parameters for given job.
		CO-6	Produce the job as per given manufacturing drawing.
4341905	Thermal Engineering-I	CO-1	Determine steam properties using a steam table and a Mollier chart.
		CO-2	Evaluate the boiler performance based on given parameters and operational data sheets.
		CO-3	Identify various features of steam nozzles, steam turbines, condensers, and cooling towers.
		CO-4	Calculate the power requirement and volumetric efficiency of air compressors.
		CO-5	Determine heat transfer parameters related to heat exchangers for different situations.
4341906	Plant Maintenance and Safety	CO-1	Understand different types unit systems and types of toolings prevailing in the market.
		CO-2	Understand ethics of dismantling and assembling the job with proper usage of tools for different machines and mechanisms
		CO-3	Justify the role of maintenance in engineering along with selection of suitable maintenance procedures.
		CO-4	Recognise the concept of safety for possible threats/hazards while working

Subject Code	Name of Subject	Course Outcome Statement	
SEM-5			
4300021	Entrepreneurship and Start-ups	CO-1	Understanding the dynamic role of entrepreneurship and Startups by Acquiring Entrepreneurial spirit and resourcefulness, quality, competency, and motivation
		CO-2	Identify a Business Idea and implement it
		CO-3	Select suitable Management practices like leadership and Ownership, resource institutes
		CO-4	Overview of Support Agencies and Incubators
		CO-5	Building Project Proposal & knowing CSR , Ethics, Ex-Im, & Exit strategies
4351901	Summer Internship-II	CO-1	Learn and adopt the engineer's role and responsibilities with ethics.
		CO-2	Get exposure to the industrial environment for professional activities.
		CO-3	Get possible opportunities to learn, understand and sharpen the technical skills required for technical advancement.
		CO-4	Develop managerial skills required for professional career.
		CO-5	Attain skill for writing technical report and prepare poster for presentation.
4351902	Manufacturing Engineering -III	CO-1	Identify effect of machining parameter on quality of products.
		CO-2	Produce the job with appropriate process, cutting tools, machine tools and cutting parameters for given work piece like gear, mechanical job with thread.
		CO-3	Expose the students to different types of Rapid prototyping processes, materials used in RP systems.
		CO-4	Select appropriate non – conventional machining method for different machining operations.
		CO-5	Outline the role of computer and automation in manufacturing.
4351903	Thermal Engineering-II	CO-1	Analyze performance of internal combustion engines using performance parameters and heat balance sheet.
		CO-2	Select IC engine fuels and related support system for internal combustion engines.
		CO-3	Identify salient features of open and closed cycles gas turbines.
		CO-4	Analyze the performance of refrigeration system using standard procedures.
		CO-5	Estimate air conditioning parameters for particular appliances.
4351904	Mechanical Engineering Project-I	CO-1	Conduct the visit and/or survey to search the problem.
		CO-2	Select the problem and outline the conceptual model of its solution.
		CO-3	Modify the conceptual model of a solution based on safety, quality, cost or sustainability.
		CO-4	Prepare plans and estimates for the solution and Project-I report.

Subject Code	Name of Subject	Course Outcome Statement	
4351907	Renewable and Green Energy	CO-1	Understand the Energy Scenario of the India and evaluate Renewable energy potential in India.
		CO-2	Demonstrate the importance of solar energy collection & storage and evaluate the performance of various solar conversion systems.
		CO-3	Determine the principle of wind energy and evaluate the potential of wind energy conversion system.
		CO-4	Illustrate the biomass energy and its application.
		CO-5	Illustrate the geothermal, tidal, ocean, wave energy and its application