SHRI JAWAHARLAL DARDA EDUCATION SOCIETY'S

JAWAHARLAL DARDA INSTITUTE OF ENGINEERING AND TECHNOLOGY

YAVATMAL

Reg. No.: F-2386 CREATING TALENT FOR TOMMORROW DTE Code - EN 1120

JAWAHARLAL DARDA INSTITUTE OF ENGINEERING & TECHNOLOGY,YAVATMAL

DEPARTMENT OF MECHANICAL ENGINEERING

List Of **C**ourse **O**utcome

CO	Title
201	**Mechanics of Material**
CO201.1	To develop an understanding in students the concept of direct, bending and shear stresses and strains, and their relationship under biaxial and triaxial loading. Elastic constants and their relationship, stress-strain dig. And their characteristics for MS steel and other metals also able to understand and analyze the numerical problems in compound bars and uni-axial tension and compression and will able to understand temperature stress analysis in compound bars.
CO201.2	To develop and understanding the analysing skills of the student for axial force, shear force and bending movement for various support conditions with different loads for simply supported and cantilever beams. Also student should understand the simple bending theory, section modulus, moment of resistance, bending stress in solids, hollow built-up section and leaf springs.
CO201.3	To develop and understand in students to analyze the shear stress distribution and power transmitted by shaft also able to understand the concept of helical spring.
CO201.4	To develop and understand the analytical skill of the student for the calculation internal pressure to thin and thick cylinders also spherical shapes.
CO201.5	To develop and understand the concept of strain energy for various conditions and to understand the principle planes, stresses.
CO201.6	To develop the concept of analyzing the statically determinant structure (Simply supported beam) subjected to various loading condition and movements by Macauley's method.
202	**Engineering Thermodynamics**
CO202.1	Students will able to understand the basic concepts of thermodynamics, temperature measurement and heat & work

	relationship for various flow & non-flow processes.
CO202.2	Students will able to state and understand the first law of thermodynamics and apply it to closed systems to calculate specified parameters such as work, heat transfer & internal energy.
CO202.3	Students will able to apply the steady-flow energy equation to a system of thermodynamic components such as heaters, coolers, pumps, turbines, pistons, etc.and estimate required balances of heat, work and energy flow.
CO202.4	Students will able to understand the second law of thermodynamics and working parameters of various heat engines like refrigerator, an IC engine, a jet engine, etc.
CO202.5	Students will demonstrate the skills for solutions of numerical problems based on various properties such as enthalpy, entropy etc.
CO202.6	Students will able to understand the concept of thermal cycles like Otto, Diesel, Rankine, and vapor-compression refrigeration cycles and calculate specified parameters such as work, efficiency/COP, quality, and heat transfer.
203	**Manufacturing Process I**
CO203.1	Student will be able to gain the knowledge of basic terminology associated Casting and special casting processes.
CO203.2	Student will be able to understand construction, working and operation of various melting furnaces.
CO203.3	Student will able to understand various metal forming processes.
CO203.4	Student will be able to analyze metal joining processes
CO203.5	Student will be capable to understand the thermal and mechanical aspects such as force, stress, strain and temperature of various processes like casting, welding, soldering, forging, rolling etc.
CO203.6	Student will understand different manufacturing processes like coining, Embossing, Sizing, Hobbing with their proper applications.
204	**Engineering Mathematics III**

CO204.1	Students are able to solve higher order Diff. Eq.
CO204.2	Students are able to find Laplace Transform of function and how to solve Diff. Eq. using L.T.
CO204.3	Students are able to Solve curve fitting by least square,Binomial,passion & Normal distribution
CO204.4	Students gain the knowledge how to solve complex integration along closed curve
CO204.5	Students are able to find solution of system of linear equation & first order diff eqn.
CO204.6	Students gain the knowledge of relation between Line, Surface & Volume integration
205	**Fluid Power I**
CO205.1	Students will understand the fundamental properties of fluid like viscosity, density, Pressure, etc which will help them for computation of various parameters, system design, performance evaluations of systems etc.
CO205.2	Students will understand the role, effect, significance of fluid in static, kinetic& dynamic condition on solid objects subjected to fluid, computation of energy associated with flowing fluid, discharge through various flow meters.
CO205.3	Students will understand methods of dimensional analysis ,procedure to apply it to various experimental & computational simulations.
CO205.4	Students will understand the behavior of fluid motion across the solid objects like pipes, plates; vanes etc and compute various associated parameters.
CO205.5	Students will understand the various Energy losses in flow of fluid through pipes.
CO205.6	Students will apply fundamental concepts of fluid dynamics in solving the problems like computation of the force exerted by the jet of water used in water turbines , understand the concept of velocity triangle, terminologies related layout of hydroelectric power plant.

206	Manufacturing Process II
CO206.1	Students will able to gain the knowledge of basic mechanics of metal cutting, machine tool & cutting tool terminology associated with manufacturing process.
CO206.2	Students will able to provide technical understanding of construction, working and accessories of Various types of machine such as Lathe machines, Milling machines & Drilling machines.
CO206.3	Students will develop ability to understand construction, working and accessories of various types machine such as Boring machines, Broaching machines, Reaming machines, power hack saw, Grinding machines, Shaper machines, Planer machines & Slotter machines.
CO206.4	Students will learn technical limitations of various machining processes with regard to shape formation and surface quality and the impact this has on design & economy.
CO206.5	Students will exhibit skills of working independently as well as in team during jobs manufacturing to upgrade oneself for working in industrial environments.
207	Energy Conversion I
CO207.1	Student will be able to understand the properties of steam, Mollier chart and Steam table.
CO207.2	Student will be able to understand the function of different components of thermal power plant.
CO207.3	Student will be able to understand the fuel, ash handling system and evaluate the performance of boilers and condensers.
CO207.4	Student will be able to understand the layout, site selection of steam power plant and the need and analysis of steam nozzle, steam turbine and its graphical representation
CO207.5	Student will be able to study the energy conservation in process industry.
208	Machine Design and Drawing I
CO208.1	Students will be able to understand concept of machine drawing, sectional and missing views.

CO208.2	Students will be able to demonstrate skills of development and intersection of regular solids and solids of revolutions.
CO208.3	Students will be able to study the fundamentals of machine design to calculate stress and deformations of machine components.
CO208.4	Students will exhibit the knowledge design procedure of riveted joints, welded joints, knuckle joint and cotter joint.
CO208.5	Students will be able to apply design procedure to helical springs, and power screw.
209	**Engineering Metallurgy**
CO209.1	Students will understand the basic concept of metallurgy and classification of materials.
CO209.2	Students will exhibit the knowledge of phase transfers by using Iron-Carbon Equilibrium Diagram along with critical temperatures.
CO209.3	Students will demonstrate the knowledge of compositions, properties and uses of alloy steels.
CO209.4	Students will understand the difference between ferrous & non ferrous material.
CO209.5	Students will demonstrate the knowledge of various heat treatment processes and their industrial applications.
CO209.6	Students will demonstrate the knowledge of powder metallurgy & its applications.
210	**Basic Electrical Drives and Control**
CO210.1	Students will be able to understand definition, scope, objectives, and limitation of electric drives, power transistor and SCR.
CO210.2	Student will be analyze the construction and characteristics and application of D.C. motor .
CO210.3	Students will be able to analyze the construction and characteristics and application of three phase induction motor .
CO210.4	Students will be able to analyze the speed control methods of A.C. and D.C. motor .
CO210.5	Students will be able to analyze the construction and characteristics and application of sensor, transducer and switches.

CO210.6	Students will be able to analyze the industrial applications of electric drives.
301	**Production Technology**
CO301.1	Students will understand the various attributes of quality and its importance for industrial up gradation.
CO301.2	Student will learn various statistical control tools for process control.
CO301.3	Students will understand the fundamental technique of work study, method study and theirapplication in industrial engg.
CO301.4	Student will exhibit knowledge about various measurement standard and techniquesin the industry.
CO301.5	Students will understand various measurement techniques like linear, angular, gear and thread measurement in metrology.
CO301.6	Student will understand the principles to design and develop new instruments and also to use the available instrument in best way.
302	**Heat Transfer**
CO302.1	Students will exhibit the concept of heat transfer, laws of heat transfer and various mathematical equations
CO302.2	Students will demonstrate the knowledge of determining the thermal conductivity of various materials.
CO302.3	Students will exhibit the skills of understanding and verifying various laws of radiation
CO302.4	Students will reveal the concept of forced convection and application of convection laws.
CO302.5	Students will evaluate concept of free convection and boiling and condensation applications
CO302.6	Students will be able to explain the concept of heat exchanger and demonstrate design of heat exchanger and effectiveness.
303	**Measurement System**
CO303.1	Students will understand the significance of measurment and types of various measuring instruments along with their applications and functional elements.
CO303.2	Students will understand the static and dynamic characterstics of

	measuring instruments and their response to various inputs
CO303.3	Student will understand the construction and working of various strain, temperature, speed, torque, power and flow measurment devices.
CO303.4	Students will understand the construction and operation of various pressure, force, vibration and displacement measurment devices.
CO303.5	Students will be able to utilize various contact type and noncontact type measurment devices to accurately measure the various physical quantities
304	**Theory of Mechine I**
CO304.1	Student will able to understand the core concept of mechanisms their inversions and machines.
CO304.2	Student will able to analyze the velocity and acceleration of various mechanisms and their applications.
CO304.3	Student will synthesize the mechanism based on the different analytical as well as graphical method.
CO304.4	Student will able to determine frictional torque and brake power using clutches, brakes, and dynamometers.
CO304.5	Student will able to design various cam profiles applicable to various machines.
CO304.6	Student will study the gear terminologies and various types of gear trains.
305	**Control System Engineering**
CO305.1	Students will understand the concept of open loop and closed loop system, transfer function, block diagram mathematical modeling and industrial controllers.
CO305.2	Student will analyze steady and transient response of the TYPE-1, TYPE-2 system.
CO305.3	Students will understand the concept of stability in time domain.
CO305.4	Determination of stability of the system in frequency domain and speed control in prime movers in control system perspective will be understood by the students.
CO305.5	Students will understand the types of systems, various industrial

	controllers, types of responses, concept of stability and various speed controllers.
306	**Computer Software Application II**
CO306.1	Students will be able to describe the basic information about database management system.
CO306.2	Students will be able to demonstrate different relational algebra operators in DBMS.
CO306.3	Students will be learning ideas about E-R model for different enterprises.
CO306.4	Students will be capable of developing the idea about structure of SQL Queries.
CO306.5	Students will learn the basic information of Relational Database design including normalization and functional dependency.
CO306.6	Students will be able to acquire the information about modelingand simulation.
307	**Fluid Power II**
CO307.1	Students will understand construction, design of pelton, fransis &Kaplan turbine, apply the concept of velocity triangle for computation of efficiencies, discharge, power for particular turbine, selection of turbine.
CO307.2	Students will understand construction, working principle of centrifugal pump and apply the concept of velocity triangle for computation of efficiencies, discharge, power etc for it.
CO307.3	Students will compute various design parameters & analyze for the purpose of problem solving and performance improvement. To be able to understand the software based flow analysis, mathematics behind it and its use.
CO307.4	Students will understand construction, working principle of reciprocating pump; flow acceleration& deceleration in it; Indicator diagram; Role of air vessel in improving performance of reciprocating pump.
CO307.5	Students will understand compressible flow and domain of its applications

CO307.6	Students will understand the fundamental concepts of fluid power &its role in development of various devices/applications
308	**Theory of Mechine II**
CO308.1	Student will able to understand the basic concept of static force analysis and hydrodynamic Lubrication.
CO308.2	Student will understand the knowledge of dynamic force analysis and use of graphical method to solve problems.
CO308.3	Student will able to understand the space mechanism and vehicle dynamics.
CO308.4	Student will understand concept of free vibration and force vibration.
CO308.5	Student will understand concept of Torsional vibration.
CO308.6	Student will understand concept of balancing of machinery and types of resistance.
401	**Industrial Management and Costing**
CO401.1	Students will be able to understand the business system , concept of management science ,organization structure & relationships and fundamentals of co-ordination, motivation and control.
CO401.2	Students will be familiar with marketing strategy, international marketing detail, methodology for new product design and development , sales strategy and program .
CO401.3	Student will understand the function of human and material resource planning and management.
CO401.4	Students will be able to understand the procedure of cost and time estimation & apply to various operations like forging and machining.
CO401.5	Students will get introduced to costing techniques, cost of components, process costing and allocation of normal and abnormal losses.
CO401.6	Students will be able to understand the financing of business , prepare financial statements and learn the methods of depreciation calculation.
402	**Machine Design and Drawing II**

CO402.1	Students will be able to understand concept of machine drawing, sectional and missing views.
CO2402.2	Students will be able to demonstrate skills of development and intersection of regular solids and solids of revolutions.
CO402.3	Students will be able to study the fundamentals of machine design to calculate stress and deformations of machine components.
CO402.4	Students will exhibit the knowledge design procedure of riveted joints, welded joints, knuckle joint and cotter joint.
CO402.5	Students will be able to apply design procedure to helical springs, and power screw.
403	**Automation Engineering**
CO403.1	Students will be able to understand the basic knowledge of automation and its strategies**.**
CO403.2	Student will get an idea about NC/CNC machine and will be able to write program for the given profile.
CO403.3	To understand all the basic concept related to robotics and robot programming and industrial application of robot.
CO403.4	Students will get an insight in to the philosophy of G.T. and apply the concepts in real life applications
CO403.5	Basic understanding about FMS, AGVS and various automated material handling system will be developed.
CO403.6	Student will develop a thinking/ understanding about the factory of future along with the automated inspection techniques**. .**
404	**Tool Engineering (elective)**
CO404.1	Students will be able to design single and multi point cutting tools.
CO404.2	Students will be able to identify the basic tool geometry.
CO404.3	Students will exhibit their knowledge in estimating tool life and designing multipoint tools like twist drills, reamers, broach and milling cutters.
CO404.4	Students will show the ability to design press working dies like punching, blanking and drawing.
CO404.5	Students will be able to design customized jigs and fixtures for holding complex geometries.

CO404.6	Students will demonstrate their skills and knowledge in modern cutting, forming, tools of the discipline to broadly defined engineering industry.
405	**Non Conventional Energy Systems (elective)**
CO405.1	Students will get knowledge of the various utilization of solar energy.
CO405.2	Students will exhibit understanding of the instruments of radiation measurement**.**
CO405.3	Students will learn difference between Renewable & Nonrenewable sources**.**
CO405.4	Students will be able to describe the various transmissions between Liquid Flat Plate Collector (LFPC) & Air Flat Plate Collector (AFPC**).**
CO405.5	Students will demonstrate knowledge of the energy generations from ocean energy and wind power**.**
CO405.6	Students will be able to describe how to store the solar energy for utilization**.**
406	**Energy Conversion II**
CO406.1	Student will be able to handle and resolve the problem related to working of reciprocating air compressor.
CO406.2	Student will understand the working principle of rotary air compressor and renewable energy.
CO406.3	Student will understand the fundamental basic of refrigeration system & its application
CO406.4	Student will be able to construction and working details of gas turbines and nuclear power plant.
CO406.5	Student will find themselves helpful to participate and succeed in power plant.
CO406.6	Student will be able to understand basic concept of thermodynamics processes and important to industry.
408	**IC Engine**
CO408.1	Students will demonstrate a basic understanding of different types of internal combustion engines and their operations.

CO408.2	Students will demonstrate an understanding of technological, environmental, and social impacts of alternative fuels.
CO408.3	Students will able to understand sound fundamental knowledge about the combustion process in SI engines.
CO408.4	Students will able to understand sound fundamental knowledge about the combustion process in CI engines.
CO408.5	Students will able to know the various parameters used for identifying engine performance and their measurements.
CO408.6	Students will be capable to study and analyze the pollution formation mechanisms in combustion of solid, liquid and gaseous fuels.
409	**Refrigeration and Air-Conditioning (elective)**
CO409.1	Students will exhibits the fundamental basic of simple vapour compression system, types of refrigerant used in refrigeration system .
CO409.2	Students will understand the multistage pressure system, its types and elementary treatment of refrigeration system
CO409.3	Students will exhibit the knowledge of refrigeration system and its controls, defrosting
CO409.4	Students will understand the concept psychrometric properties and psychrometric processes, human comfort and its related issues.
CO409.5	Student will be understand the concept of test refrigeration equipment and its fault finding.
CO409.6	To understand the concept air conditioning system and its application in day to day life
411	**Machine Tool Design (elective)**
CO411.1	The student will be able to understand basics of machine tool design, different types of machine tools, identify various applications of machine tools in different manufacturing Processes & to define the standard procedure of gear box, feed box design.
CO411.2	The student will be able to understand selection procedure of power drives required for machine tools and standard design procedures for machine tool parts like beds, carriage, column.

CO411.3	The student will be able to understand design procedure of slide ways and guide ways & selection of different protecting device.
CO411.4	The student will be understand design procedure spindles and bearings etc. in aligned with productivity and economic aspects. Design different machine tools considering static and dynamic loads.
CO411.5	The Student will be able to consider several other important aspects like vibration minimization, removal of chatters increasing cutting tool life, maintainability of machine tools.
CO411.6	The Student will be able to use machine tool as EQUIVALENT ELASTIC SYSTEM and demonstrate the knowledge of design of reliable machine tool structure with proper drive mechanism.
412	**Automobile Engineering (elective)**
CO412.1	Students will able to classify automobiles, understand power system for propulsion, complete engine part details , assembly, lubrication, functioning and cooling systems.
CO412.2	The Students will understand the fuel supply systems for CI engines and SI engines.
CO412.3	The Students will understand the cooling, electrical system of an automobile and its application in ignition and starting system.
CO412.4	Students will learn the manual and automatic transmission systems of an automobile along with rear axle drives and differential system.
CO412.5	Students will understand the control systems of an automobile viz… the steering and braking systems and suspension system.
1CO412.6	The Students will understand the troubles, causes and remedies associated with various systems of an automobiles.
413	**Operation Research and Techniques**
CO413.1	Students will be able to understand definition, scope, objectives, phases, models and limitation of operation research
CO413.2	Students will be able to understand different application areas of operation research like linear programming, transportation problem, assignment model and network model in industries as

	well in real life situations
CO413.3	Students will be able to use knowledge of operation research to solve, replacement problems , game theory problems in real Life situations.
CO413.4	Students will be able to use knowledge of operation research to solve dynamic programming, waiting line model problems and sequencing problem in real Life situations.
CO413.5	Students will be able to learned and handle the mathematical tools that are needed to solve optimization problems
CO413.6	Students will be able to develop an ability to solve complex decision making problems under uncertainty and risk