

Chameli Devi Group of Institutions
Department of Mechanical Engineering

Semester: ODD

Year/Semester: II Year/III Semester

Course Name: Thermodynamics

Course Code: ME 302

Course Outcome

- **The students will explain the concepts of system, surroundings, thermodynamic properties, thermodynamic equilibrium, work and heat. After understanding these basic concepts, students can determine the properties, work and heat transfers through various processes.**
- **Students will be able to infer the different types of pure substances and their properties.**
- **The students will be able to explain the working of air standard cycles and hence will be able to compare their efficiencies.**
- **The students will be able to explain the different grades of fuels and ultimately they can estimate for the calorific values of fuels.**

Semester: ODD

Year/Semester: II Year/III Semester

Course Name: Material Technology

Course Code: ME 303

Course Outcome

- **Students will be able to explain the different properties of engineering materials.**
- **Students will be able to identify different types of cast iron and steels.**
- **Students will be able to discuss different heat treatment processes.**
- **Students will be able to identify different material testing processes.**
- **Students will be able to classify different chemical analysis processes for commercial metals.**

Semester: ODD

Year/Semester: II Year/III Semester

Course Name: Strength of Material

Course Code: ME 304

Course Outcome

- **Student are able to learn about basic mechanical properties of material, stress strain curve, elastic constants, volumetric strain.**
- **Student are able to learn about principle plane, principle stress and strain, Mohr's circle method.**
- **Student are able to learn about concept of torsion and torsion equation with application.**
- **Student are able to learn about column and struts, Euler's equation for different column and Rankine relation for strut.**

Semester: ODD

Year/Semester: II Year/III Semester

Course Name: Manufacturing Process

Course Code: ME 305

Course Outcome

- **Student will be able to extrapolate the concept of casting as one of manufacturing technology.**
- **Extrapolate the concept of welding technology and discuss various welding processes.**
- **Extrapolate the concept of forging technology, discuss various rolling processes.**
- **Student will be able to extrapolate press working operations.**
- **Student will be able to extrapolate various machining operations & machine tools.**

Semester: EVEN

Year/Semester: II Year/IV Semester

Course Name: Energy & Environment Engineering

Course Code: ES 401

Course Outcome

- After studying the content scholar will able to compare and differentiate about available energy systems, Energy sources and possible future options based on demand and supply.
- After studying the content, students will be able to identify the various segments of environment and ecosystem, which will help them to be a better engineer and serve the society in a positive manner.
- After studying the content students will be able to compare and value the Bio-geography of India, Biodiversity of the country, Threats to biodiversity and its conservation.
- After studying the content scholar will able to identify and examine the sources of pollution, types, solution for the issue and impact on the society.
- After studying the content students will be able to identify and construct solutions for the issues related to society like energy, climate change and water availability, its harvesting, Issues involved in enforcement of environmental legislation, and public awareness.

Semester: EVEN

Year/Semester: II Year/IV Semester

Course Name: Instrumentation and Control

Course Code: ME 402

Course Outcome

- Student will be able to explain basic concepts of Measurement System, Performance characteristics and Measurement System Behaviour.
- Content of this unit helps student to explain types of signal, Fourier transform and response to the transient input.
- Student will be able to discuss construction, working and application of various temperature, Pressure, Velocity and flow measurement devices.
- Contain of this unit helps student to explain construction, working and application of various Strain measurement, force, and torque measurement devices.
- Student will be able to extrapolate control system, transfer function and system modelling.

Semester: EVEN

Year/Semester: II Year/IV Semester

Course Name: Theory of Machine

Course Code: ME 403

Course Outcome

- **Student will be able to explain and interpret the basics fundamentals, kinematics and dynamics of different mechanisms and machines.**
- **Student will be able to explain and interpret the kinematic synthesis of mechanisms.**
- **Student will be able to classify and interpret the cam & followers and sketch the cam profiles for different follower motions.**
- **The students should be able to explain and demonstrate the kinematics of belt-pulley, flat and v –belt. Also should be able to demonstrate friction, friction devices, pivot and collars, power screw, clutches, and brakes.**
- **The students should be able to explain and demonstrate Gears, laws of gearing, classification and basic terminology, tooth profiles, and its kinematic considerations.**

Semester: EVEN

Year/Semester: II Year/IV Semester

Course Name: Fluid Mechanics

Course Code: ME 404

Course Outcome

- **Students will be able to describe different properties of fluids.**
- **Students will be able to discuss kinematics of fluid flow.**
- **Students will be able to identify different fluid flow equations.**
- **Students will be able to discuss boundary layer phenomena.**
- **Students will be able to classify laminar and turbulent flow.**

Semester: EVEN

Year/Semester: II Year/IV Semester

Course Name: Manufacturing Technology

Course Code: ME 405

Course Outcome

- **Student will be able to extrapolate the concept of machining processes.**
- **Student will be able extrapolate the concept of gear machining processes.**
- **Student will be able extrapolate the use of plastics in manufacturing technology.**
- **Student will be able to extrapolate unconventional machining processes.**
- **Student will be able to extrapolate extrusion process and NC machine tools.**

Semester: ODD

Year/Semester: III Year/V Semester

Course Name: Internal Combustion Engine

Course Code: ME 501

Course Outcome

- **Students will be able to extrapolate the working of two stroke and four stroke SI and CI engines, engine nomenclature, performance parameters, and concepts of multi cylinder engines.**
- **Students will be able to extrapolate the combustion phenomenon and stage of combustion stages in SI engine, phenomenon of abnormal combustion and its types.**
- **Students will be able to extrapolate the combustion phenomenon and stage of combustion stages in CI engine, phenomenon of abnormal combustion and its types.**
- **Students will be able to extrapolate the different types of fuels, alternate fuels, and characteristics and rating of SI and CI engine fuels.**
- **Students will be able to extrapolate the concept of supercharging and turbocharging, methods of supercharging and cooling and lubrication of engines.**

Semester: ODD

Year/Semester: III Year/V Semester

Course Name: Mechanical Vibration

Course Code: ME 502

Course Outcome

- **Students will be able to discuss undamped free vibrations.**
- **Students will be able to describe damped free vibrations.**
- **Students will be able to discuss harmonically excited vibrations.**
- **Students will be able to identify two degree of freedom systems.**
- **Students will be able to classify different types of sound.**

Semester: ODD

Year/Semester: III Year/V Semester

Course Name: Mechatronics

Course Code: ME 503-A

Course Outcome

- The students will be able to explain the mechatronics in multidisciplinary scenario, origin and evaluation of mechatronics. The students will also be able to recognize the various elements of measurement systems and can able to discuss the need, objective, advantages, disadvantages and applications of mechatronics.
- The students will be able to classify and describe the various types of transducers and sensors. The students will also be able to explain the microprocessor based digital control, digital, binary and hexadecimal number systems, and their logic functions.
- The students will be able to recognize the 8085A microprocessor architecture and associated terminology. The students will also be able to discuss and classify the various types of microcontrollers.
- The students will be able to classify and describe the various types of electrical actuation systems with examples. Students will be able to explain the various kind of bouncing in mechanical switches, solenoids, relays, diodes, thyristors, triacs, transistors, Darlington pair, principle construction and working of AC/DC motors, stepper motors, permanent motors, and servo motors.
- The students will be able to explain the concept of signal conditioning, necessity, operational amplifiers, protection, filtering, wheat stone bridge, multiplexers and de-multiplexers, data acquisition system, the concept and methods of digital signal processing.

Semester: ODD

Year/Semester: III Year/V Semester

Course Name: Dynamics of Machine

Course Code: ME 503-B

Course Outcome

- Students will be able to Interpret and demonstrate to solve the problems on Engine Dynamics, Turning Moment Diagrams and Energy stored in the flywheel.
- Students will be able to interpret and demonstrate to solve the problems on governor mechanisms.
- Students will be able to Interpret and demonstrate the problem of Balancing of Rotating and Reciprocating Masses

- Students will be able to interpret and demonstrate to solve the problems on governor mechanisms.
- Students will be able to interpret and demonstrate to solve the problems on brakes, dynamometer & cams.

Semester: ODD

Year/Semester: III Year/V Semester

Course Name: Industrial Engineering & Ergonomics

Course Code: ME 504-A

Course Outcome

- The student should be able to understand and explain Method study.
- The student should be able to understand and explain Work measure & Work sampling.
- The student should be able to understand and explain the basic concepts of Job evaluation and incentive schemes & Standard data system.
- The student should be able to understand and explain the basic concepts of Human factor engineering.
- The student should be able to understand and explain the basic concepts of Display systems and anthropometric data.

Semester: EVEN

Year/Semester: III Year/VI Semester

Course Name: Thermal Engineering & Gas Dynamics

Course Code: ME 601

Course Outcome

- **Student will be able to generalise the concepts of basics of boilers, boiler performances and working of different boilers.**
- **Student will be able to explain about Rankine Vapour Cycle and binary vapour cycle.**
- **Student will be able to generalised the concepts of sonic velocity, Mach number, and nozzle**
- **Student will be able to explain about classification of compressor, single stage and multistage compressor.**
- **Student will be able to recognize the use of steam nozzles, effect of friction, cooling towers and types of condensers.**

Semester: EVEN

Year/Semester: III Year/VI Semester

Course Name: Machine Component Design

Course Code: ME 602

Course Outcome

- **Students will be able to classify different stresses and loadings on machine element.**
- **Students will be able to discuss the designing process of shafts.**
- **Students will be able to describe the designing process of springs.**
- **Students will be able to discuss the designing process of brakes and clutches.**
- **Students will be able to describe different journal bearings.**

Semester: EVEN

Year/Semester: III Year/VI Semester

Course Name: Turbo Machinery

Course Code: ME 603-A

Course Outcome

- **Student are able to learn about general equation of turbomachinery and various efficiencies used for analysis of turbomachines.**
- **Student are able to learn about application and analysis of different steam turbine and concept of compounding with velocity diagram.**
- **Student are able to learn about application and analysis of different water turbine and concept of centrifugal pump with velocity diagram.**
- **Student are able to learn about application and analysis of different compressor with velocity diagram.**
- **Student are able to learn about application various turbomachines like hydraulic lift, hydraulic crane, hydraulic accumulator, torque convertor, fluid coupling etc.**

Semester: EVEN

Year/Semester: III Year/VI Semester

Course Name: Product Design

Course Code: ME 603-C

Course Outcome

- **The student should be able to understand and explain the concept of Product life-cycle and basic Product design process.**
- **The student should be able to understand and explain the process of functional analysis.**
- **The student should be able to understand and explain the basics of QFD, DFX, DFM, DFA, and Ergonomics in product design.**
- **The student should be able to understand and explain the guidelines of Product design.**
- **The student should be able to understand and explain the basic processes of rapid prototyping.**

Semester: EVEN

Year/Semester: III Year/VI Semester

Course Name: Robotics

Course Code: ME 604-A

Course Outcome

- The students will be able to recognize the concept, structure and classification of industrial robots. The students will also be able to describe the robot motion characteristics and its industrial applications.
- The students will be able to explain the different drive systems and end effectors used in industrial robots.
- The students will be able to identify and select the various types of sensors used in robot applications.
- The students will be able to recognize the various types of robot programming methods and it's their applications.
- The students will be able to discuss the various safety and economic aspects of industrial robots and will also be able to describe the concept of testing methods and acceptance rules for industrial robots.

Semester: EVEN

Year/Semester: III Year/VI Semester

Course Name: Renewable Energy Technology

Course Code: ME 604-C

Course Outcome

- After studying this unit, students will be able to explain the geometry of solar radiation, measuring instruments and utilization of solar energy in domestic sections.
- After studying this unit, students will be able to describe the construction and performance wind energy conversion systems.
- After studying this unit, students will be able to explain various biomass resources, its conversion techniques and utilization for the production of electricity.
- After studying this unit, students will be able to explain various categories of small hydro power plants and ocean energy resources along with the construction of power plants and their working.
- After studying this unit, students will be able to explain the utilization of geothermal energy sources, hydrogen as an energy source and usefulness of fuel cells.

Semester: ODD

Year/Semester: IV Year/VII Semester

Course Name: Heat & Mass Transfer

Course Code: ME 701

Course Outcome

- **Student will be able to extrapolate the concept of machining processes.**
- **Student are able to learn about basic modes of heat transfer & thermal resistance concept, general heat conduction equation.**
- **Student are able to learn about composite wall, composite cylinder, and critical thickness of insulation.**
- **Student are able to learn about free & forced convection and application of Nussult theory with various imperical relationship.**
- **Student are able to learn about various heat exchanger analysis with LMTD & NTU Method.**
- **Student are able to learn about various law of radiation and concept of mass transfer with Fick's law of diffusion.**

Semester: ODD

Year/Semester: IV Year/VII Semester

Course Name: Power Plant Engineering

Course Code: ME 702-C

Course Outcome

- **After studying this unit, students will be able to explain the conversion of renewable energy system into electrical power.**
- **After studying this unit, students will be able to describe the construction and performance of fossil fuel based power plant**
- **After studying this unit, students will be able to explain the nuclear power plant, its construction, working and its safety.**
- **After studying this unit, students will be able to explain the performance of hydro based power plant.**
- **After studying this unit, students will be able to explain and Determine economics of the power plant of renewable and non-renewable / nuclear power system**

Semester: ODD

Year/Semester: IV Year/VII Semester

Course Name: Operation Research & Supply Chain

Course Code: ME 703-A

Course Outcome

- **The student should be able to understand, formulate and solve simple linear programming problems as networks and graphs.**
- **The student should be able to understand and explain the basics of Supply chain.**
- **The student should be able to understand, formulate and solve simple Inventory models.**
- **The student should be able to understand and explain the basic problems of Inventory models & Competitive strategy.**
- **The student should be able to understand, formulate and solve simple Decision analysis.**

Semester: EVEN

Year/Semester: IV Year/VIII Semester

Course Name: Refrigeration & Air-Conditioning

Course Code: ME 801

Course Outcome

- **Student are able to learn about basic refrigeration cycle & Air refrigeration system.**
- **Student are able to learn about vapour compression cycle & vapour absorption cycle.**
- **Student are able to learn about various refrigerant and their properties along with eco-friendly refrigerants.**
- **Student are able to learn about concept of air conditioning and its thermodynamic cycle.**
- **Student are able to learn about comfort conditioning and load calculation for air conditioning plants.**

Semester: EVEN

Year/Semester: IV Year/VIII Semester

Course Name: Automobile Engineering

Course Code: ME 802-A

Course Outcome

- **Student will be able to understand the construction of automobiles, aerodynamic considerations in body shape design, and intelligent safety systems, and the drive lines.**
- **Students will be able to describe the front axle, steering geometries and various types of steering linkages.**
- **Students will be able to describe components of transmission system and types of gear boxes**
- **Students will be able to describe the underbody components of vehicle.**
- **Students will be able to describe the electrical systems of vehicle.**

Semester: EVEN

Year/Semester: IV Year/VIII Semester

Course Name: Entrepreneurship and Management Concepts

Course Code: ME 803-C

Course Outcome

- **The student should be able to understand and explain the basics of System Concepts and work system model.**
- **The student should be able to understand and explain the basic principles and definitions of Management.**
- **The student should be able to understand and explain the basics of Marketing.**
- **The student should be able to understand and explain the basics of Productivity and Operations.**
- **The student should be able to understand and explain the basic concepts of Entrepreneurship.**