

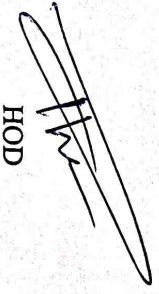
# Government Polytechnic Korea

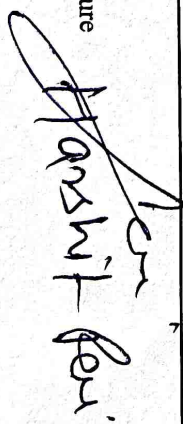
**Department- Mechanical Engineering**

**Subject - Applied Mechanics**

S.No.	Topic to taught	No. of Lecture required	Date of Theory Delivery	Topic Covered	Remark
<b>Unit1 Fundamentals and Resolution of Forces</b>					
1	Definition of Mechanics, Statics, Dynamics- Kinetics, Kinematics. Concept of space, mass, particle, body, rigid body, scalar, vector, fundamental units, derived units.	01	27/03/25	As per program	
2	Force- concept, definition, unit, graphical representation. Concept of system of forces non-coplanar, coplanar; concurrent, non-concurrent and parallel forces. Composition and Resolution of forces. Free body diagrams, law of parallelogram, Varignon's theorem	02	01/04/25 02/04/25	✓	
3	Numericals	01	03/04/25	✓	
4	Equilibrium of Coplanar concurrent forces, parallel forces and non-concurrent forces, Lami's Theorem. Moment of a force and Couple, properties of couple, conditions of equilibrium, applications.	01	09/04/25	✓	
5	Numericals	03	14/04/25, 17/04/25, 18/04/25	✓	
<b>Unit2 Centroid and Moment of Inertia</b>					
1	Location of Centroid and, Center of Gravity. Centroid of regular plane and compound areas. Center of Gravity of simple solid	01	24/04/25	As per program	
2	Numericals of centroid	01	29/04/25	✓	
3	Moment of Inertia of plane areas. Perpendicular and Parallel Axis theorem	01	30/04/25	✓	
4	numericals of MOI	01	01/05/25	✓	
<b>Unit 3 Friction</b>					
1	1 Rough and Smooth surfaces, concept of friction. Types of friction, Coulomb's laws of friction, Co-efficient of friction, angle of friction, angle of repose. Friction on horizontal and inclined plane,	01	06/05/25	✓	
2	Method of reducing friction. Screw and Nut friction, friction in journal Bearings	01	07/05/25	✓	
3	Numericals	03	08/05/25, 09/05/25, 13/05/25	✓	
4	Numericals	01	15/05/25	✓	
<b>Unit4 Kinematics and Kinetics</b>					
1	Kinematics in Cartesian and polar coordinates. Concept of speed, velocity, acceleration, radial and transverse velocity, Particle under uniform and non-uniform acceleration, tangential and normal acceleration.	01	17/06/25 18/06/25	✓	

Angular displacement, Angular Velocity, Angular Acceleration.					
	Motion under gravity	01	19/06/25	As per planning	
	Numericals	01	24/06/25	—	
3	Kinetics of particle, motion under constant force, Newton's Laws of Motion. Momentum and energy principles. Impulse and angular momentum.	01	25/06/25	—	
4	Numericals	01	26/06/25	—	
5	Work, Power and Energy				
1	Work-Definition and unit of work done, force displacement diagram, torque, work done by torque.	01	01/07/25	All topics covered	
2	Numericals	03	02/07/25 03/07/25 04/07/25	—	
3	Power-Definition and unit of Power, I.H.P and B.H.P of engine, Equation of H.P in terms of Torque and R.P.M. Energy- Definition and units of Energy, Kinetic and Potential energy. Relation between Heat and Mechanical work, relation between Electrical and Mechanical energy	02	17/07/25 22/07/25	—	
4	Numericals		29/07/25/30/07/25	—	
Unit 6	Simple Lifting Machines and Transmission of power				
1	Load, Effort, Mechanical advantage, Velocity ratio, Efficiency and relation between them. Law of Machine, Reversibility of Lifting machine.	02	05/08/25 06/08/25	All topics covered.	
2	Numericals on Law of Machine	01	07/08/25	—	
3	Study of Machines Differential wheel and axle, Simple Screw Jack, Pulley block, System of pulleys. Simple and compound levers.	01	12/08/25	—	
4	Transmission of power through Belt (flat belt, Vbelt, Timer belt), Rope, Gears (Spur, Helical, worm and worm wheel, rack and pinion)	01	12/08/25	—	
5	Gear trains (Simple, compound, epicyclic); terminology; classification, salient features, area of application, velocity ratio and efficiency.	01	14/08/25	—	
6	numericals	01	19/08/25	—	

  
HOD

Faculty Name & Signature  
  
 Anshu Peri  
 Principal

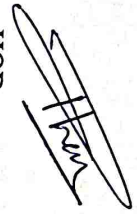
# Government Polytechnic Korea

**Department- Mechanical Engineering**


**Subject - Manufacturing process**

S.No.	Topic to taught	Date of Theory Delivery	Topic Covered	Remark
<b>Unit1</b>	<b>Introduction to Manufacturing Processes</b>			
1	1.1 Classification of basic manufacturing process based on chip-less and chip-removal processes, Primary and Secondary manufacturing processes, Various generating & forming processes,	01 27/01/25	As per plan	
2	1.2 Factors which influence selection of manufacturing process for a particular application.	01 31/01/25	—	
3	1.3 Recall mechanical properties of metals	02 03/02/25	—	
<b>Unit2</b>	<b>Metal Casting</b>			
1	2.1 Definition and Need 2.2. Pattern: types, materials, pattern allowances, color code, applications 2.3 Cores: Need, types, materials	02 06/02/25 07/02/25	As per plan	
2	2.4 Moulds: Molding sand: Types, properties, binders, additives, mixing, Molding equipments & tools Type of moulds, mould making, applications	03 16/02/25 11/02/25 12/02/25	—	
3	2.5 Melting of metal: Pit furnace, Cupola, Induction furnace 2.6 Metal pouring: Gates and Risers.	01 13/02/25	—	
4	2.7 Casting Processes: Dry sand mould casting, Shell mould casting, Investment casting, Die casting, Centrifugal casting.	02 14/02/25 15/02/25	—	
5	Casting defects: Blow, scar, blister, gas holes, pin holes, porosity, drop, inclusion, dross, dirt, wash, buckle, scab, rat tail, penetration, swell, misrun, cold shut, hot tear, shrinkage cavity, mould shift, core shift	03 17/02/25 18/02/25 20/02/25	—	
6	2.9 Inspection of castings: Visual inspection, pressure test, magnetic particle inspection, dye penetration inspection, Radiographic inspection, ultrasonic inspection. 2.10 Safety precautions in metal casting	02 21/02/25 22/02/25	—	
<b>Unit 3</b>	<b>Metal Forming and Press working</b>			
1	3.1 Cold and Hot working of metals, effect on metal properties, advantages & limitations.	01 03/02/25	—	

	3.2 Forming processes, types, working principle, tools and equipment, applications of: Rolling,	01	01/03/25	—	
3	Forging, Drawing, Deep drawing, Extrusion	01	05/03/25	—	
4	3.4 Press working: Emphasis that press working is not forming process, Punching, Blanking, Notching, Lancing, Slitting, Nibbling, Trimming	03	06/03/25 07/03/25 08/03/25	—	
<b>Unit4</b>	<b>Metal Joining</b>				
1	Classification, recall gas and arc welding processes.	01	16/03/25	—	
	Working principle, equipment, sketch, process parameters, applications of:				
2	(i) MIG, TIG, Flux coated arc and submerged	03	11/03/25 12/03/25 17/03/25	—	
3	(ii) Resistance welding – Butt, Seam, Spot, Projection and Percussion.	01	18/03/25	—	
4	(iii) Thermit welding, (iv) Forged welding	01	19/03/25	—	
5	Effects of welding heat Weld defects and their causes. Safety precautions in welding.	04	20/03/25 21/03/25 22/03/25 24/03/25	—	
<b>Units</b>	<b>Plastic Molding and Powder Metallurgy</b>				
1	Plastic Molding: Concept, working principle, equipment and applications of Compression molding.	01	01/04/25	—	
2	Blow molding, Injection molding and Extrusion	01	02/04/25	—	
3	Powder Metallurgy: Introduction, advantages and disadvantages	01	03/04/25	—	
4	Powder metallurgy processes: Powder making, blending, compacting, sintering, infiltration and impregnation, Applications	01	04/04/25	—	



HOD

Faculty Name & Signature  
  
 Principal

# Government Polytechnic Korea

**Department- Mechanical Engineering**

**Subject - Advanced Manufacturing process**

S.No.	Topic to taught	No. of Lec Required.	Date of Theory Delevery	Topic Covered	Remark
<b>Unit1. Non-Conventional Machining Processes</b>					
1	Need of advance manufacturing, manufacturing trends and challenges, manufacturing aspects.	02	09/01/25 10/02/25	As per planned.	
2	Types of non conventional machining processes and energy source utilized.	01	10/01/25	As per planned.	
3	Working principle, setup, Process parameter Advantages, limitation and application and safe practices of- Electrical discharge machining (EDM), Wire Electrical discharge machining (WEDM),	02	14/01/25 16/01/25	As per planned.	
4	Working principle, setup, Process parameter Advantages, limitation and application and safe practices of- Electrochemical Machining (ECM), Plasma arc machining (PAM),	02	17/01/25 02/02/25	As per planned.	
5	Working principle, setup, Process parameter Advantages, limitation and application and safe practices of- Abrasive jet machining (AJM), Ultrasonic Machining (USM)	03	21/01/25 22/01/25 24/01/25	As per planned.	
6	Working principle, setup, Process parameter Advantages, limitation and application and safe practices of Electron Beam Machining (EBM), Laser beam machining (Cutting)	02	29/01/25 31/01/25	As per planned.	
<b>Unit2 Advanced Casting Processes</b>					
1	Metal casting basics, Gating and riser design,	01	01/02/25	All topics covered	
2	Working principle, setup, process parameters, Advantages, limitations and applications of Evaporative pattern casting process (EPC),	03	05/02/25 04/02/25 06/02/25	All topics covered	
3	Working principle, setup, process parameters, Advantages, limitations and applications of Centrifugal and pressure diecasting	02	12/02/25 13/02/25	As per planned.	
4	Working principle, setup, process parameters, Advantages, limitations and applications of Slush casting, Hybrid EPC process, Vacuum EPC	02	17/02/25 20/02/25	As per planned.	
5	Working principle, setup, process parameters, Advantages, limitations and applications of shell moulding process	03	21/02/25 22/02/25 23/02/25	As per planned.	
<b>Unit 3 Advanced Welding and Forming Processes</b>					
1	Working principle, setup, Process parameter Advantages, limitation and application - Orbital TIG welding, Electron beam welding (EBW),	02	08/03/25 04/03/25	As per planned.	
2	Laser beam welding (LBW), ultrasonic welding.	01	08/03/25	As per planned.	
3	Industrial adhesive and Adhesive bonding	01	10/03/25	As per planned.	
4	Advanced Metal forming- High energy rate forming,	01	11/03/25	As per planned.	
5	Electro-magnetic forming, explosive forming, Electro- hydraulic forming,	01	12/03/25	As per planned.	



# Government Polytechnic Korea

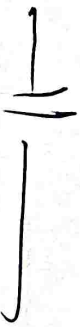



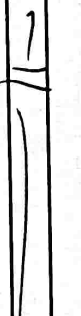
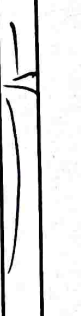

**Department- Mechanical Engineering**

**Subject - Automobile Engg**

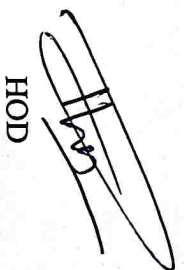
S.no.	Topic to taught	Date of Theory Delivery	Topic Covered	Remark
Unit1.0	<b>Essentials of Automobile</b>			
1	Introduction, classification of automobiles	23/09/24	As per planing	
2	Types of automobiles. Two wheeler/Light Commercial Vehicle/Sport Utility Vehicle/Heavy commercial Vehicles	24/09/24	—	
3	Layout of automobile, importance of vehicle layout, types of vehicle layout (FFWD, FERWD, RERWD, 4WD), Advantages, Disadvantages, Applications and Comparisons of Different types of vehicle layouts, Major components of the automobile and its functions and location.	25/09/24	—	
4	Layout of chassis, Frame and Body: <ul style="list-style-type: none"> <li>• Requirement of Chassis, classification of chassis. Function of Chassis</li> <li>• Frame and Body, Load acting on Frame, advantages, disadvantages and applications of different types of chassis</li> </ul>	26/09/24	—	
5	Significance of Body Streamlining: Need and Importance of Aerodynamic Aspects, Basic terms related with Car Aerodynamics (e.g. Drag, Lift, Skin Friction, Form Drag, Wake, Coefficient of Drag etc.)	30/09/24	—	
6	Automotive engines Types of Automobile Engines: Petrol Engine, Diesel Engine. Engines locations - front, rear and transverse under floor with their advantages and disadvantages.	01/10/24	—	
7	Engine Constructional features : Engine block, engine heads, crank case oil pan, cylinder liners, Gasket, combustion chambers with their types, piston, piston pin, gudgeon pin, connecting rod, crank shaft, cam shaft, Valve & valve mechanism. Valve timing / port timing diagram, timing gears, Inlet & Exhaust mufflers, concept of firing order in multi-cylinder engine. Lubrication and cooling.	07/10/24	—	
Unit-2	<b>Fuel supply system and auto-electric and electronic</b>			
1	Introduction of fuel system for petrol engine. Gravity feed system, Fuel pump, Simple and solex carburetor.	14/10/24	—	
2	Concept of Petrol Injection (Mechanical and Electronic injection systems) & MPFI Petrol injection systems. Concept of supercharging. Introduction of fuel	15/10/24	—	
3	Concept of Fuel injection systems and Its Construction, Working of Fuel injection pump and their types, Fuel injector.	16/10/24	—	

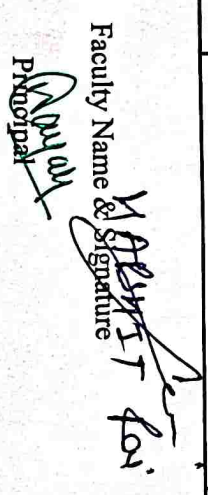
cal and Electronic system 2.5 Basic Electrical-Electronics Components used in automobiles with their conventional symbols.

4	Main Components of the Electrical and electronic System. Function of Starting and charging systems, construction and Working of Alternator.		17/10/24	—	
4	Ignition System, Function and Requirement of Ignition System, Distributor, Ignition Coil, Ignition Timing, Ignition Advance, coil and Electronic Ignition System. Lighting system, Automobile Battery- Function of Battery, Types of Battery		18/10/24	—	
5	Principle of Lead Acid Battery, Construction and Operation of Lead Acid Battery Low-maintenance and Maintenance-free Batteries., Significance of Battery Rating & Battery Capacity, Battery Open Volt and Specific Gravity Test. Types of Lights, Necessity and Importance of Cable Color Codes, Wiring Harness.		19/10/24	—	
6	Different types of Gauges, Windscreen wiper, Function & Location of Major Sensors and Actuators used in Automobile Electronics		19/10/24	—	
7	<b>Unit-3 Brakes, Clutch and Suspension systems</b>				
1	Need & function of braking system, principle of braking system, Brake efficiency, stopping distance and basic terms related to braking. Electric and Electronic technology used in braking system		22/10/24	—	
2	Foundation brakes - drum and disc brakes, Hydraulic and pneumatic brakes, Self energized brakes, Power brakes, Air brakes, Emergency & Parking Brakes Floating-calliper brakes, ceramic pads, twin brake disc systems, hybrid systems, coated discs, anti-squeal technology		23/10/24	—	
3	Electronic brakes - EPB (electric park brake), ESP (electronic stability control), braking assistance, predictive braking, brake-by-wire, slip control, regenerative braking, autonomous emergency braking Anti lock braking System: Layout of ABS, Pressure Modulation, and Types of ABS.		24/10/24	—	
4	Electric Driven Intelligent Brake-construction, working and its function Construction and Working of Master Cylinder, Wheel Cylinder, Tandem Master Cylinder, Significance and general procedure of Bleeding of Brake.		26/10/24	—	
5	Need and function of clutch system, construction and working of clutch system, classification of clutch Types of clutch systems ,Single plate and multi plate clutch, Centrifugal clutch, Semi centrifugal clutch AMTs (automate manual transmission), CVTs, DCTs (direct-shift, Hybrids clutch.		06/10/24	—	

<p>Function of Suspension system, construction and working of Suspension system, classification of Suspension system, Types of suspensions used in automobiles.</p> <p>Function and Requirement of Rigid Suspension System: Basic Terms - Jounce, Rebound, Sprung and Unsprung Weight, Spring Rate, Elasticity, Types and Constructional Features of Leaf Springs, Function of Independent Suspension System, Advantages of Front Wheel Independent Suspension, Construction and Working of Mac-Pherson Strut Type, Wishbone Type Suspension system</p>		08/11/24		
<p>7 Shock Absorbers and Air Suspension: Layout, Construction and Working of Air Suspension, Function and Types of Shock Absorber, Principle of Hydraulic Shock Absorber, Construction and Working of Telescopic Shock Absorber, Constructional Features &amp; working of Gas Filled Shock Absorber</p>		09/11/24		
<p>Unit-4 Automobile Transmission system</p> <p>Need and functions of transmission system.</p> <p>Concept of various road resistances such as wind, Gradient, Resistance, Total resistance, Tractive- effort.</p> <p>Types of transmission systems. Need of gear box, function and working of gear box, construction of gear box, types of gear boxes - sliding mesh. Constant mesh, synchromesh gear boxes, mathematical analysis of gear boxes, Gear shifting mechanisms, five speed gear box</p>		11/11/24		
<p>Function , construction and working of Torque converter, Overdrive automatic transmission, fluid flywheel and epicyclic gear train</p> <p>Functions of propeller shaft, types of propeller shaft, Universal joints &amp; slip joints on propeller shaft.</p>		15/11/24		
<p>Function &amp; need of differential Final drive and differential</p> <p>Axles: function and need of axles, types of axles,</p> <ul style="list-style-type: none"> <li>• Function and need of rear axle such as semi floating, fully floating, Three quarter floating.</li> <li>• Rear axle drives such as Hotchkiss type, torque tube type.</li> <li>• Function and need of Front Axle, Types of (Front) Stub axle</li> </ul>		22/11/24		
<p>Unit-5 Automobile Steering and Tyre system Steering system</p>				
<p>1 Function of the steering system, Steering wheel &amp; column, Basic Terms related to Steering- Steering Ratio, Turning Radius, Under steering and Over steering, Basic Components of Steering Linkages</p> <p>Steering geometry, adjusting the steering angles, Ackerman principal.</p>		26/11/24		

	<p>tion and Working of Rack and Pinion, Re-circulating Ball Type Steering          car Box Power steering, Principle of Power Steering, Steering lock,          Construction and Working of Hydraulic and Electronic Power Steering.</p>				02/12/24	As per plan	
3	<p>Significance and ranges of Caster (Positive, Negative), Camber (Positive, Negative), Toe-in, Toe out, King Pin Inclination (KPI), Steering Axis Inclination (SAI) Steering trouble shooting</p>				02/12/24	✓	✓
4	<p>Types of Automobile Wheels, Rims and Tyres, Construction and Working of Different Types of Wheels, Rims and Tyres, specifications. Criteria for Selection of tyre.          Wheel alignment and balancing, procedure of Wheel Alignment, Purpose of Wheel Balancing, Significance of Static and Dynamic Balancing, Procedure for Static and Dynamic Balancing.          Tyre Economy: Consideration in Tyre Tread Design, Factors affecting to Tyre Life, Tyre Wear and Rotation, Tyre Designation.</p>				02/12/24	✓	✓
Unit-6	Automobile Emissions and its Control						
1	<p>Introduction, Complete and Incomplete Combustion.          Constituents of Exhaust Gases, Pollutant Formation Effect of Air Fuel Ratio on Exhaust Emission, Effect of Driving Mode on Exhaust Emission, Sources of Pollutants in an Automobile          Control Approaches for Automobile Emission</p>				03/12/24	✓	✓
2	<p>Muffler, Alternative Fuels- Layout of Vehicle operated on Natural Gas (LPG &amp; CNG): Need, Fuel Characteristics, Construction &amp; Working, Advantages, and Limitations. Layout of Electric Vehicles: Need, Working, Advantages, Limitations. Hydrogen as fuel.</p>				04/12/24	✓	✓
3	<p>Motor Vehicle Act Salient Features of M. V. Act 1988 and Central Motor Vehicle Rules 1989. 6.1.2, Types and Significance of Traffic Signs, Important Transport Terms in M. V. Act (Motor Vehicle, Motor Cycle, HGV, MGV, LGV, Public Service Vehicle, Transport Vehicle, Driver, Passenger, Accident</p>				09/12/24	✓	✓
4	<p>Passenger Comfort and Safety, Function and requirements of Passenger Safety System. Features of Air Bags, Seat Belts, Collapsible Steering Column.</p>				12/12/24	✓	✓

  
 HOD

Faculty Name & Signature  
  
 P. Mohanraj

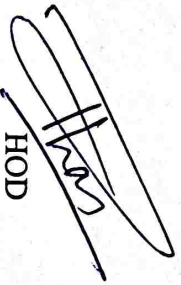
# Government Polytechnic Korea


**Department- Mechanical Engineering**

**Subject - Applied Mechanics**

No.	Topic to taught	No. of Lecture required	Date of Theory Delivery	Topic Covered	Remark
<b>t1</b>	<b>Fundamentals and Resolution of Forces</b>				
	Definition of Mechanics, Statics, Dynamics- Kinetics, Kinematics. Concept of space, mass, particle, body, rigid body, scalar, vector, fundamental units, derived units.	01	21/09/24	—	
1	Force- concept, definition, unit, graphical representation. Concept of system of forces non-coplanar, coplanar, concurrent, non-concurrent and parallel forces. Composition and Resolution of forces. Free body diagrams, law of parallelogram, Varignon's theorem	01	26/09/24	—	
2	Equilibrium of Coplanar concurrent forces, parallel forces and non-concurrent forces, Lamí's Theorem.	01	03/10/24	—	
3	Moment of a force and Couple, properties of couple, conditions of equilibrium, applications.	01	17/10/24	—	
4	Numericals	01		—	
5	Numericals	01		—	
	<b>Unit2 Centroid and Moment of Inertia</b>				
	Location of Centroid and, Center of Gravity.				
1	Centroid of regular plane and compound areas.	01	24/10/24	—	
2	Center of Gravity of simple solid	01	29/10/24	—	
3	Numericals of centroid	01	29/10/24	—	
4	Moment of Inertia of plane areas. Perpendicular and Parallel Axis theorem	01	29/10/24	—	
5	Moment of Inertia of MOI	01		—	
	<b>Unit 3 Friction</b>				
1	1 Rough and Smooth surfaces, concept of friction. Types of friction, Coulomb's laws of friction, Co-efficient of friction, angle of friction, angle of repose.	01	02/11/24	—	
2	Friction on horizontal and Inclined plane,	01	05/11/24	—	
3	Method of reducing friction. Screw and Nut friction,	01	06/11/24	—	
4	friction in journal Bearings	01	07/11/24	—	
5	Numericals	01	09/11/24	—	
	<b>Unit 4 Kinematics and Kinetics</b>				
	Kinematics in Cartesian and polar coordinates. Concept of speed, velocity, acceleration, radial and transverse velocity, Particle under uniform and non-uniform acceleration, tangential and normal acceleration.	01	23/11/24	—	

3	Motion under gravity Numericals			06/12/24	11	
4	Kinetics of particle, motion under constant force, Newton's Laws of Motion. Momentum and energy principles, Impulse and angular momentum.			11	11	
5	Numericals			11	11	
Units	Work, Power and Energy			07/12/24	11	
1	Work-Definition and unit of work done, force displacement diagram, torque, work done by torque.			08/12/24	11	
2	Numericals			16/12/24	11	
3	Power-Definition and unit of Power, I.H.P and B.H.P of engine, Equation of H.P in terms of Torque and R.P.M. Energy- Definition and units of Energy, Kinetic and Potential energy. Relation between Heat and Mechanical work, relation between Electrical and Mechanical energy			20/12/24	11	
4	Numericals			21/12/24	11	
Unit 6	Simple Lifting Machines and Transmission of power					
1	Load, Effort, Mechanical advantage, Velocity ratio, Efficiency and relation between them. Law of Machine, Reversibility of Lifting machine.			23/12/24	11	
2	Numericals on Law of Machine			23/12/24	11	
3	Study of Machines Differential wheel and axel, Simple Screw Jack, Pulley block, System of pulleys, Simple and compound levers.			03/01/25	11	
4	Transmission of power through Belt (flat belt, Vbelt, Timer belt), Rope, Gears (Spur, Helical, worm and worm wheel, rack and pinion)			03/01/25	11	
5	Gear trains (Simple, compound, epicyclic): terminology, classification, salient features, area of application, velocity ratio and efficiency.			03/01/25	11	
6	numericals					

  
HOD

Faculty Name & Signature  
  
Anshu for  
Principal