

LESSON PLAN FOR THERMAL ENGINEERING-II

Name of Teacher- Abhay Thakur		Subject-THERMAL ENGINEERING-II	Jan-May 2025	Class- 4th sem, ME
S.NO.	WEEK	CONTENTS		REMARKS
1	Week 1	Gas Turbines: Air-standard Brayton cycle; Brief description along with derivation of efficiency of Air standard Brayton Cycle with P- V and T-S diagrams, Gas turbines Classification: open cycle gas turbines and closed cycle gas turbines		
2	Week 2	Comparison of gas turbine with reciprocating I.C. engines and steam turbines. Applications and limitations of gas turbines; General layout of Open cycle constant pressure gas turbine; P-V and T-S diagrams and working; General layout of Closed cycle gas turbine; P-V and T-S diagrams and working.		
3	Week 3	Jet Propulsion : Principle of jet propulsion; Fuels used for jet propulsion; Applications of jet propulsion; Working of a turbo jet engine; Principle of Ram effect; Working of a Ramjet engine; Principle of Rocket propulsion; Working principle of a rocket engine; Applications of rocket propulsion; Comparison of jet and rocket propulsions.		
4	Week 4	Properties of Steam: Formation of steam under constant pressure; Industrial uses of steam; Basic definitions: saturated liquid line, saturated vapour line, liquid region, vapour region, wet region, super heat region, critical point, saturated liquid		
5	Week 5	saturated vapour, saturation temperature, sensible heat, latent heat, wet steam, dryness fraction, wetness fraction, saturated steam, superheated steam, degree of superheat; Determination of enthalpy, volume and entropy of wet, dry and super heated steam using steam tables and Mollier chart, Throttling process, Simple direct problems on the above using steam tables and Mollier charts.		
6	Week 6	Steam Generators: Function and use of steam boilers; Classification of steam boilers with examples; Brief explanation with line sketches of Cochran, Babcock and Wilcox Boilers; Comparison of water tube and fire tube boilers.		
7	Week 7	Description with line sketches and working of modern high pressure boilers Lamont and Benson boilers; Boiler mountings: Pressure gauge, water level indicator, fusible plug, blow down cock, stop valve, safety valve. (dead weight type, spring loaded type);		
8	Week 8	Boiler accessories: economizer, super heater and air pre-heater; Study of steam traps & separators; Concept of the terms: Actual evaporation, equivalent evaporation, factor of evaporation, boiler horse power and boiler efficiency; Formula for the above terms without proof; Simple direct problems on the above terms.		
9	Week 9	Steam Nozzles : Type of steam nozzles; Flow of steam through nozzle; Velocity of steam at the exit of nozzle in terms of heat drop using analytical method; Simple direct problems on the above only using analytical method,		
10	Week 10	Discharge of steam through nozzles; Critical pressure ratio; Methods of calculation of crosssectional areas at throat and exit for maximum discharge.		
11	Week 11	Steam Turbines: Classification of steam turbines with examples; Difference between impulse & reaction turbines; Principle of working of a simple De-lavel turbine with line diagrams- Velocity diagrams (Diagrammatic representation only);		
12	Week 12	Methods of reducing rotor speed; compounding for velocity, for pressure or both pressure and velocity; Working principle with line diagram of a Parson's Reaction turbine-velocity diagrams(Diagrammatic representation only);		
13	Week 13	Bleeding, re-heating and re-heating factors; Governing of steam turbines: Throttle, By-pass & Nozzle control governing.		
14	Week 14	Determination of enthalpy, volume and entropy of wet, dry and super heated steam using steam tables and Mollier chart, Throttling process, Simple direct problems on the above using steam tables and Mollier charts.		


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LESSON PLAN FOR AUTOMOBILE ENGINEERING

Name of Teacher- Abhay Thakur		Subject-AUTOMOBILE ENGINEERING	Jan-May 2025	Class- 4th sem, ME
S.NO.	WEEK	CONTENTS		REMARKS
1	Week 1	Introduction to basic structure of an automobile: Basic engine components; Cylinder block; Cylinder head; Gaskets; cylinder liners, types of cylinder liners; Piston and piston pin; piston rings, types of piston rings;		
2	Week 2	Connecting rod; Crank shaft; Cam shaft; Crankcase; Engine valves; Fly- wheel and Governor.		
3	Week 3	Cooling and lubrication system: The necessity of cooling system; Types of cooling system-air cooling and water cooling; Air cooling system; Types of water cooling system – Thermosyphon system and pump circulation system; Advantages and disadvantages of air cooling and water cooling systems;		
4	Week 4	The components of water cooling system–fan, radiator, pump and thermostat; The necessity of lubrication system; S.A.E rating of lubrication system; Types of lubrication system; Petrol lubrication and high pressure lubrication system.		
5	Week 5	Fuel feed system: Conventional fuels and alternative fuels: Cetane and octane numbers; Types of carburetors; Working of simple carburetor; Multi point and single point fuel injection systems; Different fuel transfer pumps.		
6	Week 6	Working of S.U electrical and A.C mechanical pump; Fuel filters; Fuel injection pump; Fuel injectors; Use of Hydrogen and Ethanol as an alternating fuel.		
7	Week 7	Ignition system: Introduction to ignition system; Battery Ignition systems and magneto Ignition system; Electronic Ignition system; Construction and working of lead acid battery; Elements of charging system; Elements of starting system; Types of lights used in the automobile:		
8	Week 8	Transmission and steering system: General arrangement of clutch; Principle of friction clutches; Constructional details of Single plate clutch; Constructional details of multi-plate clutch; Constructional details of centrifugal clutch;		
9	Week 9	Necessity for gear ratios in transmission; Types of gear boxes; Working of sliding mesh gear box; Working of constant mesh gear box; Working of propeller shaft Working of propeller shaft; Working of universal joint		
10	Week 10	Working of differential; Types of rear axle; Purpose of front axle; Necessity of steering system; Caster, camber and king pin inclination; Rack and pinion steering system; Power steering.		
11	Week 11	Suspension system: Necessity of suspension system; Torsion bar suspension systems; Leaf spring and coil spring suspension system		
12	Week 12	Independent suspension for front wheel and rear wheel; Working of telescopic shock absorber; Functions of brakes; Types of brakes; Working of internal expanding brake; Working of disc brake		
13	Week 13	Special vehicles: Introduction to Special vehicles; Tractor; Motor grader; Scrappers; Excavators; Duper trucks.		
14	Week 14	Hybrid and Electric Vehicles: Introduction to Hybrid and Electric Vehicles; History of Hybrid and Electric Vehicles; Social and environmental importance of Hybrid and Electric vehicles; Electric Vehicle drive train		



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LESSON PLAN FOR THERMAL ENGINEERING LAB-II

Name of Teacher- Abhay Thakur	Subject- THERMAL ENGINEERING LAB-II	Jan-May 2025	Class- 4th sem, ME
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S.NO.	WEEK	CONTENTS	REMARKS
1	Week 1	Study of Cochran, Babcock and Wilcox boiler with model	
2	Week 2	Study of Cochran, Babcock and Wilcox boiler with model	
3	Week 3	Study of boiler mountings and accessories	
4	Week 4	Study of boiler mountings and accessories	
5	Week 5	Conduct performance test on VCR test rig to determine COP of the refrigerator	
6	Week 6	Conduct performance test on reciprocating compressor	
7	Week 7	Conduct Morse test to determine the indicated power of individual cylinders	
8	Week 8	Conduct Morse test to determine the indicated power of individual cylinders	
9	Week 9	Conduct Performance test on 2/4-Stroke CI/SI engine.	
10	Week 10	Conduct Heat balance test on CI/SI engine..	
11	Week 11	Study of steam turbine through models..	
12	Week 12	Thermal conductivity test on Thick slab/Thick cylinder	
13	Week 13	Thermal conductivity test on Thick slab/Thick cylinder	
14	Week 14	Leak detection of refrigeration equipment	



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LESSON PLAN FOR MANUFACTURING ENGINEERING LAB-II

Name of Teacher- Abhay Thakur	Subject-MANUFACTURING ENGINEERING LAB-II	Jan-May 2025		Class- 4th sem, ME
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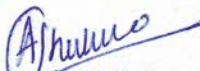
S.NO.	WEEK	CONTENTS	REMARKS
1	Week 1	Arc welding (i) Lap Joint (ii) Butt Joint (iii) T-Joint . Gas welding (i) Lap joint (ii) Butt Joint	
2	Week 2	Spot welding (i) Lap Joint	
3	Week 3	To prepare a gear blank on lathe machine. . Cylindrical grinding on lathe with tool post grinding attachment.	
4	Week 4	Moulding & casting of Connecting rod by preparing suitable pattern.	
5	Week 5	Preparation of a single ended spanner by hand forging.	
6	Week 6	Mounting and balancing of grinding wheel. Cylindrical grinding of external surface and internal surface using universal grinding machines	
7	Week 7	Practice on centreless grinding machine.Grinding flat surface on a surface grinder using magnetic table and clamping devices	
8	Week 8	Practice on cylindrical and centreless grinding machines.	
9	Week 9	Grinding Cutting tools to the required angles	
10	Week 10	Dismantling some of the components of drilling machine and service, assemble the same	
11	Week 11	Dismantling some of the components of drilling machine and service, assemble the same	
12	Week 12	Dismantling some of the components of shaper head and then assemble the same	
13	Week 13	Servicing of universal grinding machine	
14	Week 14	Servicing of universal grinding machine	



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LESSON PLAN FOR INDIAN CONSTITUTION

Name of Teacher- Abhay Thakur		Subject-Indian Constitution	Jan-May 2025	Class- 6th sem, ME
S.NO.	WEEK	CONTENTS		REMARKS
1	Week 1	Unit 1 Introduction to Constitution: History of making of the Indian Constitution. Meaning and importance of the Constitution. Salient features and Preamble of Indian Constitution.		
2	Week 2	Fundamental rights- meaning and limitations. Directive principles of state policy and Fundamental duties -their enforcement and their relevance.		
3	Week 3	Unit 2 Union Government: Structure of Union Government. Union Executive- President, Vice-president, Prime Minister, Council of Ministers.		
4	Week 4	Union Legislature- Parliament and Parliamentary proceedings.		
5	Week 5	Union Judiciary-Supreme Court of India – composition and powers and function.		
6	Week 6	Unit 3 State and Local Governments: Structure of State Government.		
7	Week 7	State Executive- Governor, Chief Minister, Council of Ministers.		
8	Week 8	State Legislature-State Legislative Assembly and State Legislative Council.		
9	Week 9	State Judiciary-High court.		
10	Week 10	Local Government-Panchayat raj system with special reference to 73rd and Urban Local Self Govt. with special reference to 74th Amendment.		
11	Week 11	Unit 4 Election provisions, Emergency provisions, Amendment of the constitution		
12	Week 12	Election Commission of India-composition, powers and functions and electoral process.		
13	Week 13	Types of emergency-grounds, procedure, duration and effects.		
14	Week 14	Amendment of the constitution- meaning, procedure and limitations.		



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LESSON PLAN FOR STRENGTH OF MATERIALS

Name of Teacher- Pankaj Chatanta	Subject-STRENGTH OF MATERIALS	Jan-May 2025	Class- 4th sem, ME
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S.NO.	WEEK	CONTENTS	REMARKS
1	Week 1	Simple Stresses and Strains: Types of forces; Stress, Strain and their nature; Mechanical properties of common engineering materials; Significance of various points on stress – strain diagram for M.S. and C.I. specimens; Significance of factor of safety	
2	Week 2	Relation between elastic constants (Formula without proof);Stress and strain values in bodies of uniform section and of composite section under the influence of normal forces; Thermal stresses in body of uniform section; Simple numerical problems on the above topics.	
3	Week 3	Strain Energy: Strain energy or resilience, proof resilience and modulus of resilience; Formula without derivation of strain energy for the following cases: i) Gradually applied load, ii) Suddenly applied load, iii) Impact/shock load; Simple numerical problems	
4	Week 4	Shear Force & Bending Moment Diagrams: Types of beams with examples: a) Cantilever beam, b) Simply supported beam, c) Over hanging beam, d) Continuous beam, e) Fixed beam; Types of Loads – Point load, UDL and UVL; Definition and explanation of shear force and bending moment	
5	Week 5	Calculation of shear force and bending moment and drawing the S.F and B.M. diagrams by the analytical method only for the following cases: a)Cantilever with point loads, b) Cantilever with uniformly distributed load, c)Simply supported beam with point loads, d)Simply supported beam with UDL	
6	Week 6	Over hanging beam with point loads, at the centre and at free ends, f) Over hanging beam with UDL throughout, g)Combination of point and UDL for the above; Related simple numerical problems.	
7	Week 7	Theory of Simple Bending and Deflection of Beams: Explanation of terms : Neutral layer, Neutral Axis, Modulus of Section, Moment of Resistance, Bending stress, Radius of curvature; Assumptions in theory of simple bending; Bending Equation $M/I = \sigma/Y = E/R$; Simple Problems involving calculations of bending stress, modulus of section and moment of resistance; Definition and explanation of deflection as applied to beams;	
8	Week 8	Deflection formulae without proof for cantilever and simply supported beams with point load and UDL only (Standard cases only); Related simple numerical problems.	
9	Week 9	Torsion in Shafts and Springs: Definition and function of shaft; Calculation of polar M.I. for solid and hollow shafts; Assumptions in simple torsion; Torsion equation $T/J = \tau/R = G\theta/L$; Simple Problems on design of shaft based on strength and rigidity; Numerical Problems related to comparison of strength and weight of solid and hollow shafts;	
10	Week 10	Classification of springs; Nomenclature of closed coil helical spring; Deflection formula for closed coil helical spring (without derivation);stiffness of spring; Simple Numerical problems on closed coil helical spring to find safe load, deflection, size of coil and number of coils.	
11	Week 11	Thin Cylindrical Shells: Explanation of longitudinal and hoop stresses in the light of circumferential and longitudinal failure of shell; Derivation of expressions for the longitudinal and hoop stress; Related numerical Problems.	
12	Week 12	Calculation of shear force and bending moment and drawing the S.F and B.M. diagrams by the analytical method only for the following cases: a)Cantilever with point loads, Simply supported beam with point loads,	
13	Week 13	Calculation of shear force and bending moment and drawing the S.F and B.M. diagrams by the analytical method for Cantilever with uniformly distributed load	
14	Week 14	Calculation of shear force and bending moment and drawing the S.F and B.M. diagrams by the analytical method Simply supported beam with UDL	



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LESSON PLAN FOR MATERIAL TESTING LAB

Name of Teacher- Pankaj Chatanta	Subject-MATERIAL TESTING LAB	Jan-May 2025	Class- 4th sem, ME
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S.NO.	WEEK	CONTENTS	REMARKS
1	Week 1	Prepare a specimen and examine the microstructure of the Ferrous and Non-ferrous metals using the Metallurgical Microscope.	
2	Week 2	Prepare a specimen and examine the microstructure of the Ferrous and Non-ferrous metals using the Metallurgical Microscope.	
3	Week 3	Detect the cracks in the specimen using (i)Visual inspection and ring test (ii)Die penetration test (iii) Magnetic particle test.	
4	Week 4	Detect the cracks in the specimen using (i)Visual inspection and ring test (ii)Die penetration test (iii) Magnetic particle test.	
5	Week 5	Determination of Rockwell's Hardness Number for various materials like mild steel, high carbon steel, brass, copper and aluminum.	
6	Week 6	Finding the resistance of materials to impact loads by Izod test and Charpy test.	
7	Week 7	Finding the resistance of materials to impact loads by Izod test and Charpy test.	
8	Week 8	Torsion test on mild steel—relation between torque and angle of twist determination of shear modulus and shear stress.	
9	Week 9	Finding Young's Modulus of Elasticity, yield points, percentage elongation and percentage reduction in area, stress strain diagram plotting, tests on mild steel.	
10	Week 10	Determination of modulus of rigidity, strain energy, shear stress and stiffness by load deflection method (Open & Closed coil spring)	
11	Week 11	Determination of modulus of rigidity, strain energy, shear stress and stiffness by load deflection method (Open & Closed coil spring)	
12	Week 12	Single or double Shear test on M.S. bar to finding the resistance of material to shear load.	
13	Week 13	Single or double Shear test on M.S. bar to finding the resistance of material to shear load.	
14	Week 14	Single or double Shear test on M.S. bar to finding the resistance of material to shear load.	



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LESSON PLAN FOR PE-WELDING TECHNOLOGY

Name of Teacher- Amandeep Sharma	Subject-PE-Welding Technology	Jan- May 2025	Class- 6th sem, ME
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S.NO.	WEEK	CONTENTS	REMARKS
1	Week 1	Introduction To Welding: Principle of welding; Classification of welding processes; Advantages, Limitations of welding; Welding applications ; Weldability.	
2	Week 2	Gas Welding: Principle of operation ; Oxyacetylene flame ; Types of flame ; Combustion of flame ; Welding Techniques ;	
3	Week 3	Filler rods And fluxes for gas welding ; Gas welding equipment and accessories ; Oxygen gas cylinders ; Acetylene gas cylinders ; Acetylene gas generator	
4	Week 4	Pressure Regulator ; Oxygen and Acetylene Hoses ; Welding Torch.	
5	Week 5	Arc Welding: Arc welding process ; Striking the arc ; Arc length ; Arc blow ; Arc welding machines- types and details ; AC and DC welding and effects of polarity ;	
6	Week 6	Electrodes-classification, specifications and selection ; Coated electrodes ; Welding defects.	
7	Week 7	Resistance Welding: Principle ; Advantages, disadvantages ; Applications ; Spot welding ; Seam welding ; Projection welding ;	
8	Week 8	Butt Welding; Upset butt welding ; Flash butt welding ; Percussion welding	
9	Week 9	Other Welding Processes: Submerged arc welding ; TIG welding ; MIG welding ; Electro slag welding ; Plasma arc welding ;	
10	Week 10	Ultrasonic welding ; Thermit welding ; Atomic hydrogen welding ; Electron beam welding ; Laser beam welding.	
11	Week 11	Brazing: Principle ; Procedure ; Brazing filler alloys; Brazing fluxes; Advantages, Limitations and applications Soldering: Principle ; Solders; Soldering fluxes; Soldering Methods; PCB Soldering	
12	Week 12	Welding Of Different Materials : Welding Cast iron, Alloy Steel, tool Steel, Aluminium, Magnesium, Stainless, Copper	
13	Week 13	Weld Defects And Testing: Types of weld Defects; their causes and prevention ; Destructive testing of welds;	
14	Week 14	Non Destructive tests- Fluorescent penetration test, magnetic particle test, ultrasonic test, radiographic test	

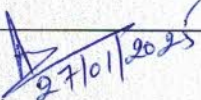

 Amandeep Sharma 27/01/2025
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LESSON PLAN FOR ENTREPRENEURSHIP AND START UP'S

Name of Teacher- Akshay Rana	Subject-Entrepreneurship and start ups's	Jan-May 2025	Class- 6th sem, ME
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S.NO.	WEEK	CONTENTS	REMARKS
1	Week 1	Introduction to Entrepreneurship and Start-Ups Definitions, Traits of an entrepreneur, Intrapreneurship, Motivation.	
2	Week 2	Types of Business Structures, Similarities/differences between entrepreneurs and managers.	
3	Week 3	Business Ideas and their implementation Discovering ideas and visualizing the business	
4	Week 4	Activity map Business Plan	
5	Week 5	Idea to Start-up Market Analysis—Identifying the target market,	
6	Week 6	Competition evaluation and Strategy Development, Marketing and accounting, Risk analysis	
7	Week 7	Management Company's Organization Structure,	
8	Week 8	Recruitment and management of talent.	
9	Week 9	Financial organization and management	
10	Week 10	Financing and Protection of Ideas Financing methods available for start-ups in India	
11	Week 11	Communication of Ideas to potential investors—Investor Pitch	
12	Week 12	Patenting and Licenses	
13	Week 13	Exit strategies for entrepreneurs , bankruptcy,	
14	Week 14	and succession and harvesting strategy	

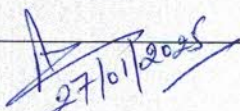

 Akshay Rana
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LESSON PLAN FOR ELEMENTS OF POWER PLANT ENGINEERING

Name of Teacher- Akshay Rana	Subject-Power Plant Engineering	Jan-May 2025	Class- 4th sem, ME
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S.NO.	WEEK	CONTENTS	REMARKS
1	Week 1	Introduction to Power plant: Introduction to power plant; Indian Energy scenario in India; Location of power plant;	
2	Week 2	Choice of Power plant; Classification of power plants.	
3	Week 3	Economics of power plant: Terminology used in power plant: Peak load, Base load factor (Introduction only); Various factor affecting the operation of power plant;	
4	Week 4	Methods of meeting the fluctuating load in power plant; Performance and operating characteristics of power plant.(Theoretical concept only)	
5	Week 5	Hydro power plant: Introduction to Hydro electric power plant; Rainfall, Runoff and its measurement, Hydrograph, flow duration curve; Selection of sites for hydro electric power plant;	
6	Week 6	General layout of Hydro electric power plant and its working; Classification of the Plant- Run off river plant, storage river plant, pumped storage plant; Advantages and disadvantages of hydro electric power plant.	
7	Week 7	Diesel and Gas turbine plant: The layout of diesel power plant; Components and the working of diesel power plant; Advantages and disadvantages of diesel power plant;	
8	Week 8	Gas turbine power Plant-Schematic diagram, components and its working; Combined cycle power generation- Combined gas and steam turbine power plant operation (only flow diagram).	
9	Week 9	Nuclear power plant: Introduction; Nuclear Power-Radio activity-Radioactive charge-types of reactions; Working of a nuclear power plant;	
10	Week 10	Thermal fission Reactors- PWR, BWR and gas cooled reactors; Advantages and Disadvantages of Nuclear power plant.	
11	Week 11	Environmental impact of Power plant: Social and Economical issues of power plant; Green house effect; Acid precipitation-Acid rain, Acid snow,	
12	Week 12	Dry deposition, Acid fog; Air, water, Thermal pollution from power plants; Radiations from nuclear power plant effluents.	
13	Week 13	Power plant safety: Plant safety concept; Safety policy to be observed in power plants; Safety practices to be observed in boiler operation;	
14	Week 14	Safety in oil handling system; Safety in Chemical handling system; Statutory provision related to boiler operation.	


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