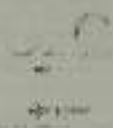




राजकीय बहुतकनीकी, हमीरपुर (हि.प्र.)
GOVT. POLYTECHNIC, HAMIRPUR (H.P.)



DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Name of Faculty	Manoj Kumar	Academic Session	Aug - Dec 2026
Course Name	Basic Mechanical Engineering	Scheme	N- 2022
Course Code	MEPC201	Semester	3rd
Course Type	Programme Core Course (PC)	Semester Start Date	01.08.2026
L-T-P	4-0-0	Semester End Date	28.11.2026

STUDY AND EVALUATION SCHEME

Teaching Hours/Week		Internal Assessment		External Assessment				Total		Credit
Theory	Practical	Theory	Practical	Theory	Hrs.	Practical	Hrs.	Theory	Practical	
04 Hrs.	NA	40	NA	60	03 Hrs.	NA	NA	100	NA	03

COURSE OUTCOMES(COs)

On the successful completion of this course, students will be able to:-	
CO1	Understand basics of thermodynamics and components of a thermal power plant
CO2	Understand basics of heat transfer, refrigeration and internal combustion engines
CO3	Understand mechanism of thermal power plant and boiler operation
CO4	Identify engineering materials, their properties, manufacturing methods encountered in engineering practice

Recommended Books

1.	Basic Mechanical Engineering by M.P.Poonia & S.C. Sharma , Khanna Publishing House
2.	Thermodynamics An Engineering Approach & Heat and Mass Transfer by Yunus A. Cengel , Mc Graw Hill
3.	Workshop Technology (Vol.1and2) by B.S. Raghuvanshi, Dhanpath Rai and Sons

Teaching Plan

Unit No	No. of Lect. Planed	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
1. Introduction to Thermodynamics	1	Introduction to Syllabus	01.08.2026		
	2	Role of Thermodynamics in Engineering and science	04.08.2026		
	3	Thermodynamic Equilibrium	05.08.2026		
	4	Properties, State, Process and Cycle	06.08.2026		
	5	Elementary introduction to Zeroth, First and Second laws of thermodynamics	11.08.2026		
	6	-----do-----	12.08.2026		
	7	Heat and Work Interactions for various processes	13.08.2026		
	8	-----do-----	18.08.2026		
	9	-----do-----	19.08.2026		
	10	Concept of Heat Engine, Heat Pump & Refrigerator, Efficiency/COP	20.08.2026		
	11	Kelvin-Planck and Clausius Statements	22.08.2026		
	12	Carnot Cycle, Carnot Efficiency, T-S and P-V Diagrams.	25.08.2026		
	13	Concept of Entropy	26.08.2026		

Unit No	No. of Lect. Planned	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
2. Heat transfer & Thermal Power Plant	14	Heat Transfer, Modes of Heat Transfer	27.08.2026		
	15	Conduction: Fourier Equation	29.08.2026		
	16	Conduction heat transfer through Composite Walls	01.09.2026		
	17	Simple Numerical Problems	02.09.2026		
	18	Convection Heat transfer: Natural and forced convection, Radiation	03.09.2026		
	19	Absorption, Reflection and transmission of radiation	05.09.2026		
	20	Concept of black body, Stefan-Boltzman Law (concept only), Thermal Power Plant Layout	08.09.2026		
	21	Rankine Cycle	09.09.2026		
	22	CT-I	10.09.2026		
	23	Fire Tube and Water Tube boilers	15.09.2026		
	24	Babcock & Wilcox	16.09.2026		
	25	Cochran Boilers	17.09.2026		
3. Steam Turbines & Internal Combustion Engines	26	Impulse and Reaction Turbines	19.09.2026		
	27	-----do-----	22.09.2026		
	28	Condensers: Jet & Surface Condensers	23.09.2026		
	29	-----do-----	24.09.2026		
	30	Cooling Towers	26.09.2026		
	31	Otto cycle; P-V and T-S Diagrams	29.09.2026		
	32	Diesel cycle; P-V and T-S Diagrams	30.09.2026		
	33	Dual cycle; P-V and T-S Diagrams	01.10.2026		
	34	IC Engines: 2-Stroke and 4-Stroke I.C. Engines	03.10.2026		
	35	S.I. and C.I. Engines.	06.10.2026		
	36	Condensers: Jet & Surface	23.09.2026		
	36	-----do-----	07.10.2026		

Unit No	No. of Lect. Planned	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
4. Materials and Manufacturing Processes (derivations and Problems omitted)	37	CT-2	08.10.2026		
	38	Engineering Materials, Classification and their Properties	13.10.2026		
	39	Metal Casting, Moulding	14.10.2026		
	40	Patterns	15.10.2026		
	41	Metal Working: Hot Working and Cold Working	17.10.2026		
	42	Metal Forming: Extrusion, Forging	21.10.2026		
	43	Metal Forming: Extrusion, Forging	22.10.2026		
	44	Metal Forming: Rolling, Drawing,	24.10.2026		
	45	Metal Forming: Rolling, Drawing,	27.10.2026		
	46	Gas Welding, Arc Welding,	28.10.2026		
	47	Soldering, and Brazing	29.10.2026		
	48	Machine Tools: Lathe Machine and types	31.10.2026		
5. Machine Tools and Machining Processes	49	Lathe Operations	10.11.2026		
	50	Milling Machine and types	11.11.2026		
	51	Milling Operations	12.11.2026		
	52	Shaper and Planer Machines: Differences	17.11.2026		
	53	Quick Return Motion Mechanism	18.11.2026		
	54	Drilling Machine: Operations	19.11.2026		
	55	Grinding Machine: Operations	21.11.2026		
	56	DCS	25.11.2026		
	57	DCS	26.11.2026		
	58	DCS	28.11.2026		

Home Assignments

Ass. No	Contents of Syllabus Covered	Proposed date (DOS)	Actual Date (DOS)	Remarks
1	Unit-1&2	30.09.2026		
2	Unit-3&4	31.10.2026		
3				

Class /House Test

Name of Test	Syllabus Covered in Tests (Unit/Chapter Wise)	Proposed date	Actual Date	Remarks
Class Test-I	30% of whole syllabus	10.09.2026		
Class Test-II	60% of whole syllabus	08.10.2026		
House Test	80% of whole syllabus	As per HPTSB Academic Calendar Schedule		

Signature of Course Teacher with Name

MANOJ KUMAR
SR. LECT. MECH.

Approved by


OIC/HoD/Principal

GOVT POLYTECHNIC HAMIRPUR, HP
DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Academic Year	AUGUST 2026 – DECEMBER 2026
Scheme	N-2022
Semester	THIRD
Course Code	MEPC 203
Course Name	MATERIAL SCIENCE & ENGINEERING
Course Type	Program Core Course (PCC)
L-T-P	3-1-0
Name of Faculty	Mithun Thakur
Semester Start & End Dates	01-08-2026 TO 28-11-2026

STUDY AND EVALUATION SCHEME

Sr. No.	Name of the Subject	Th.	Pr.	Internal Assessment			External Assessment					Total Marks	Credit
				Th.	Pr.	Total	Th.	Hrs.	Pr.	Hrs.	Total		
1	MATERIAL SCIENCE & ENGINEERING	04	00	40	00	40	60	03	00	00	60	100	04

Teaching Plan

Unit No	No. of Lect. Planned	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
1	1	Unit cell and space lattice	03.08.2026		
	2	Crystal system: The seven basic crystal systems	04.08.2026		
	3	Crystal structure for metallic elements: BCC, FCC and HCP	05.08.2026		
	4	Coordination number for Simple Cubic, BCC and FCC	06.08.2026		
	5	Atomic radius: definition, atomic radius for Simple Cubic, BCC and FCC	10.08.2026		
	6	Atomic Packing Factor for Simple Cubic, BCC, FCC and HCP	11.08.2026		
	7	Classification-primary or chemical bond	12.08.2026		
	8	secondary or molecular bond	13.08.2026		
	9	Concept of Types of primary bonds: Ionic, Covalent and Metallic Bonds	17.08.2026		
2	10	Introduction of Isomorphs, eutectic and eutectoid systems	18.08.2026		
	11	Iron-Carbon binary diagram	19.08.2026		
	12	Iron and Carbon Steels	20.08.2026		
	13	Iron ores–Pig iron: classification, composition and effects of impurities on iron	24.08.2026		
	14	Cast Iron: classification, composition, properties and uses	25.08.2026		
	15	Wrought Iron: properties, uses/applications of wrought Iron	26.08.2026		
	16	standard commercial grades of steel as per BIS	27.08.2026		

Unit No	No. of Lect. Planned	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
		and AISI			
	17	Alloy Steels – purpose of alloying; effects of alloying elements, Important alloy steels	31.08.2026		
	18	Silicon steel, High Speed Steel(HSS), heat resisting steel, spring steel, Stainless Steel(SS)	01.09.2026		
3	19	Properties and uses of aluminum, copper, tin, lead, zinc, magnesium and nickel	02.09.2026		
	20	CLASS TEST -01	03.09.2026		
	21	Copper alloys: Brasses, bronzes – composition, properties and uses	07.09.2026		
	22	Aluminium alloys: Duralumin, hinalium, magnelium – composition, properties and uses	08.09.2026		
	23	Aluminum alloys: Duralumin, hinalium, magnelium – composition, properties and uses	9.09.2026		
4	24	Nickel alloys: Inconel, Monel, nichrome – composition, properties and uses. Anti-friction/Bearing alloys	10.09.2026		
	25	Nickel alloys: Inconel, monel, nicrome – composition, properties and uses. Anti-friction/Bearing alloys	14.09.2026		
	26	Various types of bearing, bronzes-Standard commercial grades as per BIS/ASME.	15.09.2026		
	27	Introduction to failure analysis	16.09.2026		
	28	Fracture: ductile fracture, brittle fracture; cleavage	17.09.2026		
	29	notch sensitivity, Fatigue	21.09.2026		
	30	concept of endurance limit	22.09.2026		
	31	concept of creep, creep curve	23.09.2026		
	32	creep fracture	24.09.2026		
	33	Destructive testing: Tensile testing	28.09.2026		
	34	compression testing	29.09.2026		
	35	Hardness testing: Brinell, Rockwell	30.09.2026		
	36	CLASS TEST-02	01.10.2026		
	38	bend test	05.10.2026		
	39	torsion test	06.10.2026		
	40	fatigue test	07.10.2026		
	41	creep test	8.10.2026		
	42	Non-destructive testing: Visual Inspection	12.10.2026		
	43	magnetic particle inspection	13.10.2026		
	44	liquid penetrant test	14.10.2026		
	45	ultrasonic inspection	15.10.2026		
	46	Radiography	16.10.2026		
5	47	Nature of corrosion and its causes	19.10.2026		
	48	Electrolytes	21.10.2026		
	49	Factors affecting corrosion: Environment, Material properties and physical conditions	22.10.2026		
	50	Types of corrosion	27.10.2026		
	51	Corrosion control: Material selection, environment control	28.10.2026		
	52	Surface engineering processes: Coatings and surface treatments	29.10.2026		
	53	HOUSE TEST	2.11.2026-		
	54		7.11.2026		
	55				
	56	Cleaning and mechanical finishing of surfaces	12.11.2026		

Unit No	No. of Lect. Planned	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
	57	Electroplating and Special metallic plating	16.11.2026		
	58	Electro polishing and photo-etching	17.11.2026		
	59	Conversion coatings: Oxide, phosphate and chromate coatings	18.11.2026		
	60	Thin film coatings: PVD and CVD	19.11.2026-		
	61	Hard-facing, thermal spraying and high-energy processes	23.11.2026-20.11.2026		
	62	Revision	25.11.2026		
	63	Revision	26.11.2026		

	Name of Book	Author Name	Publication
Prescribed Books	MATERIAL SCIENCE & ENGINEERING	O.P. Khanna,	Dhanpath Rai and Sons, New Delhi. 2003.
	MATERIAL SCIENCE & ENGINEERING	R.K. Rajput,	S.K. Kataria & Sons, New Delhi, 2004
	MATERIAL SCIENCE & ENGINEERING	R.S. Khurmi	S. Chand & Co. Ltd., New Delhi, 2005.

Course outcomes - At the end of the course, the student will be able to:

CO1:- Explain about crystal structures and atomic bonds.

CO2:- Describe about classification of ferrous metals and their properties

CO3:- Explain about non-ferrous metals, cutting tool materials and composites along With their properties

CO4:- Describe about the various metallic failures and knowledge in testing of materials.

CO5:- Explain the principle of corrosion, their types and its prevention methods along With the various surface engineering processes.

S.No.	Assignment	Proposed Date	Actual Date
1	Assignment 1	01.09.2026	
2	Assignment 2	12.10.2026	

S.No.	TEST	Proposed Date	Actual Date
1	Class Test -1	2 nd week of Sep	
2	Class Test -2	2 nd week of Oct	
3	House Test	1 st week of Nov	


 Faculty (Mithun Thakur)


 HOD

Govt. Polytechnic Hamirpur (H.P.)

Lecture Planning

Branch: Mechanical Engineering

Session: Aug. - Nov. 2026

Teacher: Er. Dinesh Kumar Patial,

Subject: Measurement and Metrology

Sr. No.	Dates	Chapter/ Unit Description	Detail of Contents	Reference Resources
1.	03 Aug. to 26 Aug.	UNIT-I: Introduction to measurements	Definition of m'ment; Significance of m'ment; Methods of m'ments: Direct & Indirect; Generalized measuring system; Standards of m'ments: Primary & Secondary; Factors influencing selection of measuring instruments; Terms applicable to measuring instruments: Precision and Accuracy, Sensitivity and Repeatability, Range, Threshold, Hysteresis, calibration; Errors in M'ments: Classification of errors, Systematic and Random error. Measuring instruments: Introduction; Thread m'ments: Thread gauge micrometre; Angle m'ments: Bevel protractor, Sine Bar; Gauges: plain plug gauge, ring Gauge, snap gauge, limit gauge; Comparators: Characteristics of comparators, Types of comparators; Surface finish: Definition, Terminology of surface finish, Taly surf surface roughness tester; Coordinating measuring machine.	R1,R2,
2.	27 Aug. to 10 Sep.	Unit-II: Transducers and Strain gauges	Introduction; Transducers: Characteristics, classification of transducers, Strain m'ments, Strain gauge, Classification, mounting of strain gauges, m'ment of force, torque, and pressure(derivations omitted); Introduction; Force m'ment: Spring Balance, Load cell; Torque m'ment: Prony brake, Eddy current, Hydraulic dynamometer; Pressure m'ment: Mcloed gauge.	R1,R2
3.	11 Sep. to 30 Sep.	Unit-III: Applied mechanical m'ments	Speed m'ment: Classification of tachometers, Revolution counters, Eddy current tachometers; Displacement m'ment: Linear variable Differential transformers (LVDT); Flow m'ment: Rotometers, Turbine meter; Temperature m'ment: Resistance thermometers, Optical Pyrometer. Miscellaneous m'ments: Humidity m'ment: hair hygrometer; Density m'ment: hydrometer; Liquid level m'ment, sight glass, Float gauge.	R1,R3,
4.	01 Oct. To 30 Oct.	Unit-IV: Limits, Fits & Tolerances	Concept of Limits, Fits, and Tolerances; Selective Assembly; Interchange ability; Hole and Shaft Basis System; Taylor's Principle. Angular m'ment: Concept; Instruments For Angular m'ments; Working and Use of Universal Bevel Protractor, Sine Bar, Spirit Level; Principle of Working of Clinometers; Angle Gauges. Screw thread m'ments: ISO grade and fits of thread; Errors in threads; m'ment of different elements such as major diameter, minor diameter, effective diameter, pitch; Two wire method; Thread gauge micrometre; Working principle of floating carriage dial micrometre.	R1,R2,R3
5.	02 Nov. To 28 Nov.	Unit-V: Gear Measurement and Testing	Analytical and functional inspection; Rolling test; m'ment of tooth thickness; Gear tooth Vernier; Errors in gears such as backlash, run out, composite. Machine tool testing: Parallelism; Straightness; Squareness; Coaxiality; roundness; run out; alignment testing of machine tools as per IS standard procedure.	R1,R2,

R1. A text book of Engineering Metrology–I.C.Gupta, Dhanpat Rai and Sons

R2. Engineering Metrology–R.K.Jain, Khanna Publishers

R3. Metrology & Measurement–Anand K Bewoor,Vinay kulakarni, Tata Mc Graw Hill

Signature of Teacher with Date

Signature of H.O.D.



Government Polytechnic Hamirpur

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Name of Faculty	Abhay Thakur	Academic Session	Aug - Dec 2026
Course Name	MANUFACTURING ENGINEERING	Scheme	N- 2022
Course Code	MEPC207	Semester	3rd
Course Type	PC	Semester Start Date	01-08-2026
L-T-P	3-1-0	Semester End Date	28-11-2026

STUDY AND EVALUATION SCHEME

Teaching Hours/Week		Internal Assessment		External Assessment				Total		Credit
Theory	Practical	Theory	Practical	Theory	Hrs	Practical	Hrs	Theory	Practical	
04 Hrs.	NA	40	NA	60	03 Hrs	NA	NA	100	NA	03

COURSE OUTCOMES(COs)

On the successful completion of this course, students will be able to:-	
CO1	Know and identify basic manufacturing processes for manufacturing different components.
CO2	Operate & control different machines and equipment.
CO3	Produce jobs as per specified dimensions and inspect the job for specified dimensions.
CO4	Select the specific manufacturing process for getting the desired type of output.

Recommended Books

S.No.	Name of the Book	Author Name	Publication
1.	Production Technology	R.B. Gupta	Satya Prakashan, New Delhi
2.	Elements of workshop Technology (Volume I&II)	S.K. Hajra Chaudary	Bose & Roy, Media Promoters and Publishers Limited.
3.	Production Technology (Volume I&II)	O.P. Khanna & Lal	Dhanpat Rai Publications

Teaching Plan

Unit No	No. of Lect. Planned	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
1. Cutting Fluids & Lubricants & Lathe Operations	1	Introduction; Types of cutting fluids.	03/08/2026		
	2	Fluids and coolants required in turning, drilling, shaping, sawing & broaching	05/08/2026		
	3	Selection of cutting fluids, Methods of application of cutting fluids.	06/08/2026		
	4	Classification of lubricants (solid, liquid, gaseous), Properties and applications of lubricants	07/08/2026		
	5	Types of lathes – light duty, Medium duty and heavy duty geared lathe.	10/08/2026		
	6	CNC lathe (Concept only) Specifications of lathe machine, Basic parts and their functions	12/08/2026		
	7	Tools in lathe machine	13/08/2026		
	8	Lathe Operations Turning, parting off, Knurling, facing, Boring	14/08/2026		
	9	Drilling, threading, step turning, taper turning	17/08/2026		
2. Broaching Machines & Drilling	10	Introduction to broaching; Types of broaching machines	19/08/2026		
	11	Horizontal type Broaching machine (Single ram & duplex ram)	20/08/2026		
	12	Vertical type Broaching machine, Pull up, pull down, and push down.	21/08/2026		
	13	Elements of broach tool; Nomenclature.	24/08/2026		
	14	Tool materials for broaching.	26/08/2026		
	15	Classification of drilling machine; Basic parts and their functions; Radial drilling machine	27/08/2026		
	16	Types of drilling operations Specifications of drilling machine.	28/08/2026		
	17	Specifications of drilling machine	02/09/2026		

	18	Types of drills & Reamers.	05/09/2026		
3. Welding & Milling	19	Classification of welding processes.	07/09/2026		
	20	Gas welding techniques, types of welding flames.	09/09/2026		
	21	Arc Welding - Principle, Equipment, Applications of arc welding, Shielded metal arc welding.	10/09/2026		
	22	Submerged arc welding, TIG / MIG welding / Brazing and soldering.	11/09/2026		
	23	Resistance welding - Spot welding, Seam welding, Projection welding. Welding defects.	14/09/2026		
	24	Introduction to milling: Types of milling machines: plain, Universal, vertical.	16/09/2026		
	25	Constructional details of milling machine & specifications.	17/09/2026		
	26	Milling operations.	18/09/2026		
	27	Simple, compound and differential indexing.	21/09/2026		
	28	Milling cutters types, Teeth materials, Tool signature.	23/09/2026		
	29	Tool & work holding devices in milling.	24/09/2026		
4. Gear Making & Press working	30	Manufacture of gears-by Casting, Moulding, Stamping, Coining.	25/09/2026		
	31	Manufacture of gears-by Extruding, Rolling, Machining	28/09/2026		
	32	Gear generating methods: Gear Shaping with pinion cutter & rack cutter.	30/09/2026		
	33	Gear hobbing: Description of gear hob, Operation of gear hobbing machine; Gear finishing processes.	1/10/2026		
	34	Gear materials and specification; Heat treatment processes applied to gears.	5/10/2026		
	35	Types of presses and Specifications, Press working operations-Cutting, bending, drawing, punching, blanking, notching, lancing.	7/10/2026		
	36	Die set components- punch and die shoe, guide pin, bolster plate, stripper, stock guide, feed stock, pilot.	8/10/2026		
	37	Punch and die clearances for blanking and piercing, effect of clearance	9/10/2026		
	38	Principles of metal removal by Grinding; Abrasives - Natural & Artificial; Bonds and binding processes.	12/10/2026		
	39	Vitrified, silicate, shellac, rubber, Bakelite bonds.	14/10/2026		
5. Grinding and finishing processes.					

	40	Factors affecting the selection of grind wheels: size and shape of wheel.	15/10/2026		
5. Grinding and finishing processes	41	Kind of abrasive, grain size, grade and strength of bond, structure of grain, spacing, kinds of bind material.	16/10/2026		
	42	Grinding machines classification: Cylindrical, Surface, Tool & Cutter grinding machines; Construction details.	19/10/2026		
	43	Principle of centerless grinding; Advantages & limitations of centerless grinding.	21/10/2026		
	44	Finishing by grinding: Honing, Lapping, Super finishing.	22/10/2026		
	45	Electroplating: Basic principles, 15 Plating metals, application.	23/10/2026		
	46	Hot dipping: Galvanizing, Tin coating, Parkerising, Anodizing; Metal spraying.	26/10/2026		
	47	Wire process, powder process and applications.	28/10/2026		
	48	Organic coatings, Finishing specifications.	29/10/2026		
	49	Tools used in turning, milling and drilling.	30/10/2026		
	50	Practice of free hand diagrams of machines and tools.	02/11/2026		
	51	Various work holding devices used in milling, turning, grinding, welding and broaching.	4/11/2026		
	52	Revision of all tools nomenclature.	5/11/2026		
	53	Gear tooth profile cautions.	6/11/2026		
	54	Universal Dividing head and differential indexing calculations.	11/11/2026		
	55	Intro to machine maintenance.	12/11/2026		
	56	Revision of previous year question papers.	13/11/2026		

Home Assignments

Ass. No	Contents of Syllabus Covered	Proposed date	Actual Date	Remarks
1	Unit-1&2	16.09.2026		
2	Unit-3&4	16.10.2026		
3				

Class /House Test

Name of Test	Syllabus Covered in Tests (Unit/Chapter Wise)	Proposed date	Actual Date	Remarks
Class Test-I	30% of whole syllabus	As per HPTSB Academic Calendar Schedule		
Class Test-II	60% of whole syllabus			
House Test	80% of whole syllabus			

Signature of Course Teacher with Name


Abhay Chakur

Approved by



OIC/HoD/Principal



Government Polytechnic Hamirpur

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Name of Faculty	Nitish Sharma	Academic Session	Aug - Dec 2026
Course Name	Thermal Engineering I	Scheme	N- 2022
Course Code	MEPC209	Semester & Branch	3rd (Mechanical)
Course Type	Program core course	Semester Start Date	01-08-2026
L-T-P	4-0-0	Semester End Date	28-11-2026

STUDY AND EVALUATION SCHEME

Teaching Hours/Week		Internal Assessment		External Assessment				Total		Credit
Theory	Practical	Theory	Practical	Theory	Hrs	Practical	Hrs	Theory	Practical	
04 Hrs.	NA	40	NA	60	03 Hrs	NA	NA	100	NA	03

COURSE OUTCOMES(COs)

On the successful completion of this course, students will be able to:-	
CO1	Know various sources of Energy and their applications.
CO2	Classify I.C .engines and understand their working and constructional features.
CO3	Draw the energy flow diagram of an I.C. engine and evaluate its performance.
CO4	Describe the constructional features of air compressor
CO5	Know the applications of refrigeration and Classify air-conditioning systems

Recommended Books

S.No.	Name of the Book	Author Name	Publication
1.	Introduction to Renewable Energy	Vaughn Nelson,	CRC Press
2.	Thermal Engineering	P.L. Ballaney	Khanna Publishers
3.	A Course in Thermal Engineering	S. Domkundwar & C.P. Kothandaraman	Dhanpat Rai.
4.	Thermal Engineering	R.K.Rajput	Laxmi publications

Teaching Plan

Unit No	No. of Lect. Planned	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
1. Sources of Energy	1	Introduction to Syllabus	01.08.2026		
	2	Brief description of energy Sources	03.08.2026		
	3	Classification of energy sources: Renewable, Non-Renewable;	04.08.2026		
	4	Solar Energy: Flat plate and concentrating collectors	05.08.2026		
	5	Applications (Solar Water Heater, Photovoltaic Cell)	10.08.2026		
	6	Wind Energy, Tidal Energy;	11.08.2026		
	7	Ocean Thermal Energy-Geothermal Energy	12.08.2026		
	8	Biogas, Biomass, Bio-diesel;	17.08.2026		
	9	Hydraulic Energy	18.08.2026		
2. Internal Combustion Engines	10	Assumptions made in air standard cycle analysis	19.08.2026		
	11	Carnot Cycle	22.08.2026		
	12	Otto Cycle	24.08.2026		
	13	Diesel Cycle	25.08.2026		
	14	Internal and external combustion engines; classification of I.C. engine	26.08.2026		
	15	Function of each part and materials used for the component parts of Engine	29.08.2026		
	16	Working of four-stroke Petrol Engine	01.09.2026		
	17	Working of four-stroke Diesel Engine	02.09.2026		
	18	Working of two stroke Petrol Engine	05.09.2026		
	19	Working of two-stroke Diesel Engine	07.09.2026		

	20	Comparison of two stroke and four stroke engines; Comparison of C.I. and S.I. engines	08.09.2026		
	21	Valve timing and port timing diagrams for four stroke and two stroke engines.	14.09.2026		
3. I.C. Engine Systems	22	Fuel system of Petrol engines	15.09.2026		
	23	Principle of operation of simple carburetor, Fuel system of Diesel engines	16.09.2026		
	24	Plunger type fuel injection pump, fuel feed pump and fuel injector (description with line diagram)	19.09.2026		
	25	do.....	21.09.2026		
	26	Cooling system ; Air cooling	22.09.2026		
	27	Water cooling system with thermosiphon method of circulation	23.09.2026		
	28	Water cooling system with radiator and forced circulation	26.09.2026		
	29	Comparison of air cooling and water cooling system	28.09.2026		
	30	Ignition systems-Battery coil ignition	29.09.2026		
	31	Magneto ignition (description and working	30.09.2026		
	32	Comparison of two systems	03.10.2026		
	33	Types of lubricating systems used in I.C. engines with line diagram	05.10.2026		
	34	Objective of turbocharging and supercharging	06.10.2026		
4. Performance of I.C. Engines	35	Brake power; Indicated power; Frictional power; Brake and Indicated mean effective pressures;	07.10.2026		
	36	Brake and Indicated thermal efficiencies; Mechanical efficiency; Relative efficiency	12.10.2026		
	37	Performance test; Morse test;	13.10.2026		
	38	Heat balance sheet	17.10.2026		
	39	Methods of determination of B.P., I.P. and F.P.;	21.10.2026		
	40	Simple numerical problems on performance of I.C. engines.	24.10.2026		
	41	Simple numerical problems on performance of I.C. engines.	27.10.2026		
5. Air Compressors & Refrigeration & Air-conditioning	42	Functions of air compressor; Uses of compressed air;	28.10.2026		
	43	Types of air compressors; Single stage reciprocating air compressor - its construction and working (with line diagram)	31.10.2026		

44	Multistage compressors-Advantages over single stage compressors	10.11.2026		
45	Description of Rotary compressors	11.11.2026		
46	Centrifugal compressor	16.11.2026		
47	Axial flow type compressor and vane type compressors.	17.11.2026		
48	Refrigeration; Refrigerant,COP,Air Refrigeration system; components, working & applications	18.11.2026		
49	Vapour Compression system; components, working & applications	21.11.2026		
50	Air conditioning; Classification of Air-conditioning systems,Window Air-Conditioner;	23.11.2026		
51	Summer Air-Conditioning system,Winter Air-Conditioning system	25.11.2026		
52	Year-round Air-Conditioning system,Central air conditioning system	28.11.2026		

Home Assignments

Ass. No	Contents of Syllabus Covered	Proposed date	Actual Date	Remarks
1	Unit-1&2	19.09.2026		
2	Unit-3&4	17.10.2026		
3				

Class /House Test

Name of Test	Syllabus Covered in Tests (Unit/Chapter Wise)	Proposed date	Actual Date	Remarks
Class Test-I 09/09/2026	30% of whole syllabus	As per HPTSB Academic Calendar Schedule		
Class Test-II 14/10/2026	60% of whole syllabus			
House Test Nov. 1st Week	80% of whole syllabus			



Nitish Sharma

Signature of Course Teacher with Name



Approved by

OIC/HoD/Principal

Govt. Polytechnic Nanded
Record of Practical Performed

Name of Instructor: Rajinder Sharma
Branch: MECH. Engg.

Workshop: Turning Shop
Semester: 3rd
Groups 1, 2, 3

Subject: ME LAB-II
Session: August to Dec 2024

Sr. No	Group	Sr. No.	G1		G2		G3		G4	
			Planned Date	Actual Date	Planned Date	Actual Date	Planned Date	Actual Date	Planned Date	Actual Date
1		Job on Facing and turning - Job on Step-Turning and grooving on Job 2	22/08/26 22/08/26 24/08/26		03/08/26 04/08/26 10/08/26		31/08/26 01/09/26 05/09/26			
2		Taper Turning, Chamerfering Threading operation on Job-I	25/08/26 22/08/26 29/08/26		11/08/26 17/08/26 18/08/26		05/09/26 07/09/26 08/09/26			
3		Marking and drilling Practice on Round Job- on Lathe	26/09/26 28/09/26 28/09/26		14/09/26 15/09/26 19/09/26		05/10/26 06/10/26 12/10/26			
4		Boring and Counterboring on Lathe Finishing, Punching or Sumbiling on Lathe	29/09/26 03/10/26 03/10/26 31/10/26		19/09/26 24/09/26 22/09/26 19/10/26		13/10/26 17/10/26 17/10/26 17/11/26			
5		The routine and Preventive maintenance of Lathe	07/11/26 09/11/26 10/11/26 16/11/26		24/10/26 24/10/26 27/10/26 31/10/26		21/11/26 21/11/26 23/11/26 28/11/26			

 Sign. of Co-coordinator
  Sign. of Foreman Inst.
  Sign. of W. Supdt.
  Sign. of HOD (Mech. Engg.)

GOVT. POLYTECHNIC KANPUR
Record of Practical Performed

Name of Instructor: Anmol Sharma
Branch: M.E

Workshop: Pattern making Shop
Semester: 3rd
Groups

Subject: ME LAB-I
Session: (Aug 26 - Nov 26)

Sr. No	Group	Sr. No.	G1		G2		G3		G4	
			Planned Date	Actual Date	Planned Date	Actual Date	Planned Date	Actual Date	Planned Date	Actual Date
1		Introduction to workshop tools, R.M and all Basic about Pattern Making.	31/8 01/09		22/8/26 (M) 22/8/26 (E)		03/08/26 04/08/26	03/08/26 04/08/26		
2		Preparation of Solid Braising pattern i) Drawing & marking.	05/09 M 05/09 E 07/09 08/09		24/8/26 25/8/26 29/8/26 M 29/8/26 E		10/8/26 11/8/26 17/8/26 18/8/26			
3		Cutting, sizing and finishing as per drawing	05/10/26 06/10 12/10		26/9/26 M 26/9/26 E 28/9/26 29/9/26		14/9/26 15/9/26 19/9/26 (M)			
4		Preparation of V-pulley pattern i) Drawing and marking	13/10 14/10 M 17/10 E 17/11		03/10/26 M 03/10/26 E 31/10/26 07/11/26		19/9/26 (E) 21/9/26 22/9/26 19/10/26			
5		Cutting, sizing and finishing as per drawing	21/11 (M) 21/11 (E) 23/11 28/11		9/11/26 10/11/26 16/11/26		24/10/26 M 24/10/26 E 27/10/26 31/10/26			

Anmol
Sign. of Co-coordinator

Shri
Sign. of Foreman Inst.

Anmol
Sign. of W. Supdt.

Shri
Sign. of HOD (Mech. Engg.)

Name of Instructor: Arun Kumar
Branch:

Govt. Polytechnic Hamirpur
Record of Practical Performed
Workshop: Machine Shop
Semester:
Groups

Subject: ME LAB-I
Session:

Sr. No	Group Topic/Job	Sr. No.	G1		G2		G3		G4		G5	
			Planned Date	Actual Date	Planned Date	Actual Date	Planned Date	Actual Date	Planned Date	Actual Date	Planned Date	Actual Date
1	Job on marking and drilling practice on mild steel round pieces.		03/08 04/08		31/08 01/09		22/08 (2)					
2	Job on Boring and reaming on job number 1.		10/08 11/08		05/09 (2)		24/08 25/08					
3	Drilling Exercise(Three different sized hole for different materials maintaining uniform distance between them)		17/08 18/08		07/09 08/09		29/08 (2)					
4	Shaping a Hexagon on a round bar, key ways and groove.		14/09 15/09 19/09-(2) 21/09 22/09		05/10 06/10 12/10 13/10 17/10-(2)		26/09 (2) 28/09 29/09 03/10 (2)					
5	Shaping step block cut dovetail to angles 60/90/120 degrees		19/10 24/10-(2) 27/10 31/10		17/11 21/11-(2) 23/11 28/11		31/10 07/11 09/11 10/11 16/11					
 W.I.  Foreman Inst.  W. Superintendent  HOD												



Government Polytechnic Hamirpur

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Name of Faculty	Abhay Thakur	Academic Session	Aug - Dec 2026
Course Name	MEASUREMENTS & METROLOGY LAB	Scheme	N- 2022
Course Code	MEPC213	Semester & Branch	3rd (Mechanical)
Course Type	PC	Semester Start Date	01-08-2026
L-T-P	0-0-2	Semester End Date	28-11-2026

STUDY AND EVALUATION SCHEME

Teaching Hours/Week		Internal Assessment		External Assessment				Total		Credit
Theory	Practical	Theory	Practical	Theory	Hrs.	Practical	Hrs.	Theory	Practical	
NA	02 Hrs	NA	40	NA	NA	60	03 Hrs	NA	100	01

COURSE OUTCOMES(COs)

On the successful completion of this course, students will be able to:-	
CO1	Measure various component of linear measurement using Vernier calipers and Micrometer.
CO2	Measure various component of angle measurement using sine bar and bevel Protractor.
CO3	Measure the geometrical dimensions of V-thread and spur gear.

Recommended Books	
1.	Engineering Metrology--R.K. Jain
2.	Engineering precision metrology--R.C. Gupta
3.	A Handbook of Industrial Metrology--ASME

Practical Performing Plan

No. of Lab. Classes Planned	Practical to be perform/conduct	Proposed Date	No. of Lab. Classes Planned	Proposed Date	Actual Date		Remarks
		G-I		G-II	G-I	G-II	
1	Measure the diameter of a wire using micrometer and compare the result with digital micrometer	06/08/2026	1	07/08/2026			
2	Measure the angle of the machined surface using sine bar with slip gauges.	20/08/2026	2	21/08/2026			
3	Measure the angle of a V-block/Taper Shank of Drill/Dove tail using universal bevel protractor.	03/09/2026	3	28/08/2026			
4	Measure the dimensions of ground MS flat/cylindrical bush using Vernier Caliper compare with Digital/Dial Vernier Caliper.	17/09/2026	4	11/09/2026			
5	Measure the geometrical dimensions of V-Thread using thread Vernier gauge.	24/09/2026	5	25/09/2026			
6	Measure the thickness of ground MS plates using slip gauges.	01/10/2026	6	16/10/2026			
7	Measure the surface roughness using roughness tester.	19/10/2026	7	30/10/2026			
8	Measurement of geometrical parameters of components like screw, gear etc. using Toolmakers microscope/ profile projector.	29/10/2026	8	6/11/2026			


Abha Thakur

Signature of Course Teacher with Name

Approved by

OIC/HOD/Principal

	Government Polytechnic Hamirpur		
	DEPARTMENT OF MECHANICAL ENGINEERING		
	LESSON PLAN		

Name of Faculty	Nitish Sharma	Academic Session	Aug - Dec 2026
Course Name	Thermal Engineering I Lab	Scheme	N- 2022
Course Code	MEPC215	Semester & Branch	3rd (Mechanical)
Course Type	PC	Semester Start Date	01-08-2026
L-T-P	0-0-2	Semester End Date	28-11-2026

STUDY AND EVALUATION SCHEME

Teaching Hours/Week		Internal Assessment		External Assessment				Total		Credit
Theory	Practical	Theory	Practical	Theory	Hrs.	Practical	Hrs	Theory	Practical	
NA	02 Hrs	NA	40	NA	NA	60	03 Hrs	NA	100	01

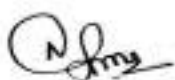
COURSE OUTCOMES(COs)

On the successful completion of this course, students will be able to:-	
CO1	Understand the determination of flash and fire point of a given sample of fuel using given Apparatus (Abels, Clevel and & Penevsky Martin)
CO2	Understand the determination of Viscosity of a given sample of oil using given apparatus.
CO3	Draw VTD/PTD of given I.C. Engine and understand how the processes are controlled during its operation.
CO4	Understand the function of ignition system of petrol engines..
CO5	Understand the function of Cooling and Lubrication system of I.C. Engine.
CO6	Understand the functions of various parts of IC engines and the working of IC engines.

Recommended Books	
1.	Thermal Engineering–P.L.Ballaney, Khanna Publishers, 2002
2.	Thermal Engineering–S. Dom kundwar & C.P. Kothandaraman, Dhanpat Rai & Publication
3.	Thermal Engineering–R.S. Khurmi and J.K.Gupta, 18th Edition, S.Chand & Co, New Delhi Course

Practical Performing Plan

No. of Lab. Classes Planned	Practical to be perform/conduct	Proposed Date	No. of Lab. Classes Planned	Proposed Date	Actual Date		Remarks
		G-I		G-II	G-I	G-II	
1	Introduction	07.08.2026	1	06.08.2026			
2	Flash & Fire point tests using Able's/Cleveland/Pensky Martin Apparatus	14.08.2026	2	13.08.2026			
3	Calorific value tests using bomb Calorimeter (Solid and liquid fuels).	21.08.2026	3	20.08.2026			
4	Assembling and disassembling of I.C. Engines	28.08.2026	4	27.08.2026			
5	Study of Port timing diagram of I.C engine(Petrol/ Diesel)	11.09.2026	5	03.09.2026			
6	Study of Valve timing diagram of I.C engine(Petrol/ Diesel)	18.09.2026	6	10.09.2026			
7	Study of petrol and diesel engine components and Models	25.09.2026	7	17.09.2026			
8	-----do-----	09.10.2026	8	24.09.2026			
9	Study of MPFI system. .	16.10.2026	9	01.10.2026			
10	Study of Battery ignition system of multi cylinder petrol engine.	23.10.2026	10	08.10.2026			
11	Study of Cooling system of I.C. engine.	30.10.2026	11	15.10.2026			
12	Study of Lubrication system of I.C. engine.	20.11.2026	12	29.10.2026			
13	-----do-----	27.11.2026	13	19.11.2026			



Nitish Sharma

Signature of Course Teacher with Name

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Approved by

OIC/HOD/Principal