

Department of Automobile Engineering
Govt. Polytechnic Kullu Distt. - Kullu (H.P.)

LESSON PLAN

Program Name	Automobile Engineering
Subject Name	Basics of Thermodynamics, Hydraulics and Pneumatics
Subject Code	ALPC 201
Semester	3rd
Subject Teacher Name	Manoj Gulera

Evaluation Scheme	N-22
-------------------	------

Sr. No	Subject Name	Study scheme (Hrs/Week)		Marks in Evaluation Scheme					
				Internal Assessment			External Assessment		
		Th	Pr	Th	Pr	Total	Th	Pr	Total
1.	Basics of Thermodynamics,Hydraulics and Pneumatics.	5	-	40	-	40	60	-	60

Reference Books	(1) Thermal Engineering By R.K. Rajput, Laxmi Publications, New Delhi (2) Hydraulics & Pneumatics By Bannder Singh, Kaptan Publishing House, New Delhi.
-----------------	--

Course Outcomes (COs)

CO - 1	Understand the basic principles of thermal engineering, gas laws, and laws of thermodynamics, air cycles and air compressors.
CO - 2	Identify components of hydraulics and pneumatics system. Comprehend different modes of heat transfer
CO - 3	Understand the basic principles air cycles and their application
CO - 4	Memorize the principles of Air Compressor and Supercharger.
CO - 5	Know the various aspects of hydraulic and pneumatic

Teaching Plan

UNITS	Name of Topic	Proposed Date	Actual Date	Remarks
Unit-I: Principles of Thermal Engineering	Principles of Thermal Engineering: Introduction	01/08/2026		
	Thermodynamics properties - intensive and extensive.	04/08/2026		
	Property, path, process, system, surroundings,	05/08/2026		
	Heat and work	06/08/2026		
	Enthalpy and internal energy	07/08/2026		
	Gas Laws: Boyle's law,	11/08/2026		
	Charles's law, Joule's law	12/08/2026		
Unit-I: Gas Laws	Characteristic gas equation,	13/08/2026		
	Gas constant,	14/08/2026		
	universal gas constant.	18/08/2026		
	Simple numerical problems.	19/08/2026		
	Modes of heat transfer,	20/08/2026		
	conduction,	21/08/2026		
	convection,	22/08/2026		
	radiation,	25/08/2026		
Unit-II: Law of Thermodynamics and Air Cycles:	Fourier's Law.	26/08/2026		
	Zeroth law of thermodynamics	27/08/2026		
	Irreversible process,	28/08/2026		
	First law of thermodynamics (concept only),	29/08/2026		
	Second law of thermodynamics (concept only),	01/09/2026		
	Thermal efficiency and heat pump,	02/09/2026		
	heat engine and heat sink,	03/09/2026		
	Concept of entropy,	05/09/2026		
	Class Test -I	08/09/2026		
	Constant volume,	09/09/2026		
	Constant pressure,	10/09/2026		
	Isothermal,	11/09/2026		
	Adiabatic,	15/09/2026		
	Polystropic	16/09/2026		
	throttling,	17/09/2026		
	Free expansion processes (concept only),	18/09/2026		
	Air Cycles Carnot cycle,	19/09/2026		
	Carnot cycle,	22/09/2026		
	Otto cycle,	23/09/2026		
	Otto cycle	24/09/2026		
	Diesel cycle	25/09/2026		
	Diesel cycle	26/09/2026		

Unit-III: Air Compressors	Dual combustion cycle.	29/09/2026	
	Dual combustion cycle.	30/09/2026	
	Reciprocating air compressor.	01/10/2026	
	Centrifugal compressor	03/10/2026	
	Class Test-II	06/10/2026	
	working of single stage compressor and applications,	07/10/2026	
	working of single stage compressor and applications,	08/10/2026	
	working of double stage compressor and applications,	09/10/2026	
	working of double stage compressor and applications,	13/10/2026	
	Rotary air compressor	14/10/2026	
Unit-IV: Hydraulics	Supercharger.	15/10/2026	
	Types of fluid,	16/10/2026	
	Properties of fluid,	17/10/2026	
	Properties of fluid,	21/10/2026	
	Pascal Law.	22/10/2026	
	Components of Hydraulic systems,	23/10/2026	
	Function of each component in hydraulic circuit,	24/10/2026	
	Function of each component in hydraulic circuit,	27/10/2026	
	Oil reservoir,	28/10/2026	
	filters,	29/10/2026	
Unit-V: Pneumatics	Hydraulic Jack	30/10/2026	
	Hydraulic Press.	31/10/2026	
	House test	NOV. 1ST WEEK	
	Basic components and their function,	10/11/2026	
	Basic components and their function,	11/11/2026	
	air cylinders – function,	12/11/2026	
	single acting	13/11/2026	
	double acting,	17/11/2026	
	air filter,	18/11/2026	
	regulator,	19/11/2026	
Unit-V: Pneumatics	different types of control valves,	20/11/2026	
	different types of control valves,	21/11/2026	
	concept of automation.	25/11/2026	
	concept of automation.	26/11/2026	
	Revision	27/11/2026	
	Revision	28/11/2026	

Assignments		Proposed Date	Actual Date	Remarks
Assignment No	Contents of Syllabus Covered			
A-1	Unit-1, Unit-2	21/08/2026		
A-2	Unit-3	09/10/2026		
House Test/Class Test		Proposed Date	Actual Date	Remarks
Name of test	Syllabus for Tests			
Class Test -1	Unit-1, Unit-2	As per HPTSB		
Class Test -2	Unit-3	Academic		
House Test	Unit-1 to Unit-4	Schedule		

(Signature of Teacher)

(Signature of HOD) 01/08/2026

Approved
Principal
Govt. Polytechnic Kullu
Distt. Kullu (H.P.)

Department of Automobile Engineering
Govt. Polytechnic Kullu Distt. – Kullu (H.P.)

LESSON PLAN

Program Name	Automobile Engineering
Subject Name	Basics of Thermodynamics, Hydraulics and Pneumatics Laboratory
Subject Code	AEPC 203
Semester	3rd
Subject Teacher Name	Mandeep Guleria
Evaluation Scheme	N-22

Sr. No	Subject Name	Study scheme (Hrs/Week)	Marks in Evaluation Scheme						
			Internal Assessment			External Assessment			
		Th	Pr	Th	Pr	Total	Th	Pr	Total
1.	Basics of Thermodynamics, Hydraulics and Pneumatics Laboratory	-	2	-	40	40	-	60	60

Course Outcomes (COs)

CO – 1	Understand the determination of flash and fire point of a given sample of fuel using given apparatus
CO – 2	Understand the determination of Viscosity of a given sample of oil using given apparatus
CO – 3	Analyze the concept of exhaust gas analyzer & smoke meter
CO – 4	Understand the morse test.
CO – 5	Develop hydraulic circuit.

Teaching Plan

Practicals	Name of Practicals	Proposed Date	Actual Date	Remarks
Practical 1	To find flash point and fire point of given fuel.	04-08-2026		G1
		07-08-2026		G2
Practical 2	To find viscosity of given fuel.	18-08-2026		G1
		21-08-2026		G2
Practical 3	To study air compressor.	01-09-2026		G1
		11-09-2026		G2
Practical 4	To analyze exhaust gases by exhaust gas analyzer.	08-09-2026		G1
		25-09-2026		G2
Practical 5	To analyze exhaust gas for diesel engine through smoke meter.	22-09-2026		G1
		09-10-2026		G2
Practical 6	To conduct Morse test of multi-cylinder petrol engines.	06-10-2026		G1
		23-10-2026		G2
Practical 7	To prepare heat balance sheet of an IC engine.	20-10-2026		G1
		30-10-2026		G2
Practical 8	Identification of components in air conditioning system.	27-10-2026		G1
		13-11-2026		G2
Practical 9	To develop hydraulic circuit using different components.	10-11-2026		G1
		27-11-2026		G2

(Signature of Teacher)

(Signature of HOD) 01/08/2026

Approved
Principal
Govt. Polytechnic Kullu
Distt. Kullu (H.P.)

Department of Automobile Engineering
Govt. Polytechnic Kullu Distt. - Kullu (H.P.)

LESSON PLAN

Program Name	Automobile Engineering
Subject Name	Automotive Materials
Subject Code	AEPC 205
Semester	3rd
Subject Teacher Name	Maneet Gulera

Evaluation Scheme

N-22

Sr. No	Subject Name	Study scheme (Hrs/Week)		Marks in Evaluation Scheme					
		Th	Pr	Internal Assessment			External Assessment		
				Th	Pr	Total	Th	Pr	Total

1.	Automotive Materials	3	-	40	-	40	60	-	60
----	----------------------	---	---	----	---	----	----	---	----

Reference Books

(1) Material Science by RK Rajput: SK Kataria and Sons, Ludhiana
(2) Material Science and Metallurgy by RB Choudary, Khanna Publishers, New Delhi

Course Outcomes (COs)

CO - 1	Distinguish between metals and nonmetals, ferrous and nonferrous materials based on different laboratory tests.
CO - 2	Analyze the composition and microstructure of specimen and change in microstructure due to various heat treatment processes.
CO - 3	Select suitable material to be used for various engineering applications on the basis of various factors such as environmental conditions, cost and desired properties.
CO - 4	Interpret iron-carbon diagram.
CO - 5	Memorize the concept of BIS and ISO standards

Teaching Plan

UNITS	Name of Topic	Proposed Date	Actual Date	Remarks
Unit I: Properties of Materials:	Classification: Metals and non-metals.	03/08/2026		
	Ferrous and non-ferrous metals and their alloys.	04/08/2026		
	Names of common metals, their alloys and nonmetals used in Automobile Industry.	10/08/2026		
	Properties of metals and alloys, Physical properties - Appearance, luster, color, density and melting point.	11/08/2026		
	Mechanical Properties: Strength, stiffness, elasticity, plasticity, toughness, ductility, malleability, brittleness, hardness, fatigue and creep.	17/08/2026		
	Thermal and electrical conductivity and corrosion resistance.	18/08/2026		
Unit II: Ferrous Metals and Alloys	Effect of alloying elements such as Aluminium, chromium, Nickel, Cobalt, Manganese, Molybdenum, tungsten, Vanadium, Silicon, Sulphur and Phosphorus.	22/08/2026		
	Composition, properties, grades and uses of alloy steels such as High speed steel.	24/08/2026		
	Composition, properties, grades and uses of alloy steels such as Stainless steel.	25/08/2026		
	Composition, properties, grades and uses of alloy steels such as Silicon steel.	29/08/2026		
	Composition, properties, grades and uses of alloy steels such as Heat resistant steel.	31/08/2026		
	Composition, properties, grades and uses of alloy steels such as spring steel.	01/09/2026		
	Heat Treatment: Iron- carbon diagram,	05/09/2026		
	Class Test -I	07/09/2026		
	objectives and practical aspects of heat treatment.	08/09/2026		
	Description and uses of principal heat treatment processes Annealing,	14/09/2026		
	Normalizing, Tempering,	15/09/2026		
	Hardening, Carburising,	19/09/2026		
	Nitriding and Cyaniding and applications.	21/09/2026		
	Case hardening and surface hardening,	22/09/2026		
	Case hardening and surface hardening,	26/09/2026		
	Hardenability of steels, Examples in heat treating automobile engineering components.	28/09/2026		
	Copper: Properties and uses,	29/09/2026		

Maneet Gulera
21/09/2026

Unit III: Non-ferrous Metals and Alloys	Composition, properties and uses of copper alloys. Brass Cartridge brass, Nickel silver.	01/10/2026			
	Class Test -II	05/10/2026			
	Bronze, Phosphor bronze, Al-bronze, Mn-bronze, and Gunmetal	06/10/2026			
	Properties and uses of Aluminium and their grades				
	Composition, properties and uses of Al- alloys	10/12/2026			
	Duralumin, Yellow metal, Magnesium and Hindalium				
	Properties and uses of alloys of lead, tin and magnesium.	13/10/2026			
	Bearing Metal: Requisite qualities, Composition, properties and uses of white metal bearing. Copper based bearing metals. Aluminium based bearing metals.	17/10/2026			
Unit IV: Identification and Examination of Metals and Alloys:	Use of nylon/PTFE for bushes/bearings, hi- metallic and tri-metallic bushes	19/10/2026			
	Identification tests-Appearance, sound, filing, weight, magnetic, spark, bend and microstructure.	24/10/2026			
Unit V: Other Important Materials:		27/10/2026			
	Plastics: Definition, classification of plastics, fiberglass, reinforced plastics.	31/10/2026			
	House test	NOV. 1ST WEEK			
	Major applications of various plastics with specific mention of their uses and grades.	09/11/2026			
	Heat insulating materials: Properties and uses of asbestos, glass wool, Thermocole, cork, mica.	10/11/2026			
	Sound insulating materials: Cork, fiberboards. Fabrication materials: Wood, plywood, Rubber - natural and synthetic.	16/11/2026			
	Glasses - plate glass, toughened glass, safety glass. Adhesive requirements types and advantages, thread locking special solution, anti-rust solution	17/11/2026			
	Electrical insulating materials, properties and uses of china clay, leather Bakelite, ebonite, glass wool.	21/11/2026			
	Refractory materials: General characteristics and uses of dolomite, ceramics.	23/11/2026			
	Protective coating materials: Auto paints, primers, varnishes, enamels, putti, electroplating materials.	28/11/2026			
	Assignments				
	Assignment No	Contents of Syllabus Covered	Proposed Date	Actual Date	Remarks
A-1	Unit-1, Unit-2	22/08/2026			
A-2	Unit-3	12/10/2026			
House Test/Class Test					
Name of test	Syllabus for Tests				
Class Test -1	Unit-1, Unit-2	Proposed Date	Actual Date	Remarks	
Class Test -2	Unit-3	As per HPTSB Academic Schedule			
House Test	Unit-1 to Unit-4				

(Signature of Teacher) *[Signature]* 01/10/2026

(Signature of HOD) *[Signature]* 01/10/2026

Approved
Principal
Govt. Polytechnic Kullu
Distt. Kullu (H.P.)

Department of Automobile Engg.
Govt. Polytechnic Kullu
Distt. - Kullu (H.P.) - 175101

LESSON PLAN

Program Name	Automobile Engineering
Subject Name	Automobile Chassis, Body And Transmission - I
Subject Code	AEIC 207
Semester	3 rd
Subject Teacher Name	Vivek Singh, Rishav.

Evaluation Scheme

Sr. No	Subject Name	Study scheme (Hrs/Week)		Marks in Evaluation Scheme					
				Internal Assessment			External Assessment		
		Th	Pr	Th	Pr	Total	Th	Pr	Total
1.	Automobile Chassis, Body And Transmission - I	5	-	40	-	40	60	-	60
Reference Books		1. Automobile Engineering, Vol. I- II by Dr. Kirpal Singh, Standard Publishers. 2. Automobile Engineering by GBS Narang, Khanna Publishers, Delhi. 3. Chassis, Body and Transmission-I by G.S.Aulakh, Eagle Prakashan, Jalandhar. 4. Automobile Engineering by R.B. Gupta, Satya Prakashan, New Delhi. 5. Chassis, Body and Transmission by Ishan Publications, Jalandhar.							

Course Outcomes (COs)

CO - 1	Classify the vehicle.
CO - 2	Understand the function and working of clutch.
CO - 3	Describe parts & function and working of manual and automatic transmission.
CO - 4	Identify constructional features of final drive and its components and front axles.
CO - 5	Identify constructional features of steering system and their components

Teaching Plan

	Name of Topic	Proposed Date	Actual Date	Remarks
UNIT-I Chassis and Body	Classification of vehicles, types of chassis, layout of conventional type of chassis.	03-08-26		
		04-08-26		
		05-08-26		
		06-08-26		
	Function and arrangement of major assemblies.	10-08-26		
		11-08-26		
		12-08-26		
		13-08-26		
	Alternating arrangement used such as engine position, drive types, their merits and demerits.	17-08-26		
		18-08-26		
		19-08-26		
		20-08-26		
	Types of frame and body streamlining, cross members, brackets.	22-08-26		
		24-08-26		
		25-08-26		
		26-08-26		
	Materials of frame and body upholstery.	27-08-26		
		29-08-26		
		31-08-26		

[Handwritten signature]

UNIT-II	Clutch	Necessity, function and requirements of clutch, types of clutch - single plate clutch, multi plate clutch.	01-09-26 02-09-26 03-09-26 05-09-26 07-09-26		
		Hydraulic power assisted and wet and dry plate clutch.	08-09-26 09-09-26 10-09-26 14-09-26		
		Class Test-I	15-09-26		
		Clutch plate and lining material Constructional details and working of centrifugal.	16-09-26 17-09-26		
		Semi centrifugal clutch, diaphragm clutch and fluid coupling.	19-09-26 21-09-26 22-09-26		
UNIT-III	Transmission	Necessity, function and types of manual transmission- Sliding, constant mesh and synchromesh.	23-09-26 24-09-26		
		Over drive, over running clutch, description and operation of transfer gear box. Common faults and remedies, trans axle construction.	26-09-26 28-09-26 29-09-26		
		Types of automatic transmission and their main components. Epicyclic gearbox-construction, working and determination of speed ratio Torque converter.	30-09-26 01-10-26 03-10-26		
		Construction, principle of working. Continuously variable transmission,	05-10-26 06-10-26 07-10-26		
		Automated Manual Transmission, hydrostatic transmission systems, direct shift gear box (DSG).	08-10-26 12-10-26		
		Class Test-II	13-10-26		
UNIT-IV	Final Drive	Propeller shaft-function, construction details. Universal joints- functions and types.	14-10-26 15-10-26 17-10-26		
		Types of final drive - hotchkiss drive, torque tube drive. Differential - principle, functions and working.	19-10-26 21-10-26 22-10-26		
		Rear axles- semi floating, three quarter floating. Fully floating.	24-10-26 27-10-26 28-10-26		

Rishabh

	Common faults and remedies	29-10-26 31-10-26		
	House test	02-11-26 to 07-11-26		
UNIT-V Front Axle & Steering	Types - Stub double drop, fully dropped, load distribution, effect of braking on axle shape, steering head, Elliot and reverse elliot, steering knuckle	12-11-26 16-11-26 17-11-26		
	Steering mechanism, function, Ackerman's Principle of steering. Working and constructional details of steering gear, steering linkages, sector arm, center arm, drag link and tie rod, steering ratio.	18-11-26 19-11-26		
	Front wheel geometry-caster, camber, steering axis inclination, toe in and toe out. Cornering force, cornering power and self-righting torque. Over steering and understeering.	21-11-26 23-11-26		
	Traction control system, Power steering- necessity, types, Construction features and working of hydraulic and electronic power steering systems	25-11-26 26-11-26		
	Four wheel steering, adjustable steering -rake and telescopic type, Common steering systems troubles and remedies.	28-11-26		

Assignments

Assignment No	Contents of Syllabus Covered	Proposed Date	Actual Date	Remarks
A-1	Unit-1, Unit-2	10-09-26		
A-2	Unit-3, Unit-4, Unit-5	29-10-26		

House Test/Class Test

Name of test	Syllabus for Tests	Proposed Date	Actual Date	Remarks
Class Test -1	Unit-1, Unit-2	As per HPTSB Academic Schedule		
Class Test -2	Unit-2, Unit-3			
House Test	Unit-1 to Unit-4			

(Signature of Teacher)

(Signature of HOD)

Approved

Principal
Govt. Polytechnic Kullu

Department of Automobile Engineering
Govt. Polytechnic Kullu Distt. – Kullu (H.P.)

LESSON PLAN

Program Name	Automobile Engineering
Subject Name	Garage Equipment
Subject Code	AEPC 209
Semester	3rd
Subject Teacher Name	Vivek Singh

Evaluation Scheme		18-22							
Sr. No	Subject Name	Study scheme (Hrs/Week)	Marks in Evaluation Scheme						
			Internal Assessment			External Assessment			
			Th	Pr	Total	Th	Pr	Total	

1	Garage Equipment	3	-	40	-	40	60	-	60
---	------------------	---	---	----	---	----	----	---	----

Reference Books	Garage Equipment by G.S. Aulakh, Eagle Prakashan, Jalandhar
-----------------	---

Course Outcomes (COs)	
CO - 1	Classify general tools for required application.
CO - 2	Understand the appropriate tuning and testing equipment for given situation
CO - 3	Apply engine repair tools.
CO - 4	Apply Electrical Repair equipment.
CO - 5	Differentiate reconditioning/testing equipment for chassis and body.

Teaching Plan		Proposed Date	Actual Date	Remarks
UNITS	Name of Topic			
Unit I: General Equipment Specifications and applications of:	Drilling machine (portable) along with set of drills	05/08/2026		
	Bench grinder	06/08/2026		
	Air compressor	12/08/2026		
	pneumatic gun	13/08/2026		
	Hydraulic and electric hoists	19/08/2026		
	High pressure washing equipment (Car washer, Car vacuum cleaner, Buffing tool)	20/08/2026		
	Oil sprayers Grease Guns-manual and bucket type,	22/08/2026		
	pneumatic Tyre inflation gauge (Manual and Digital type)	26/08/2026		
	Tyre Changer (Manual and Automatic)	27/08/2026		
	Creepers Fire extinguisher First aid box.	29/08/2026		
Unit II: Tuning and Testing Equipment Specifications and applications of:	Vacuum Gauge, Compression Gauge (Pressure Gauge)	09/02/2026		
	Distributor Tester, Cam (dwell)	09/03/2026		
	angle tester, r.p.m. tester.	09/05/2026		
	Battery Tester Spark plug cleaner and tester	09/09/2026		
	Ignition timing light Fuel injector tester	10/09/2026		
	Fuel consumption tester.	16/09/2026		
Unit III: Engine Repair Tools/Measuring and Testing Equipment Specifications and applications of:	Torque wrench, pneumatic wrench	17/09/2026		
	Piston ring compressor Valve lifter and valve spring	19/09/2026		
	Piston ring files, groove cleaner Scrappers	23/09/2026		
	Piston ring remover Cylinder Dial gauge	24/09/2026		
	Smoke meter engine Analyser/Scanner	26/09/2026		
	Part degreasing tank.	30/09/2026		
Unit IV: Electrical Repair Equipment Specifications and uses of:	Electrical Test Bench	01/10/2026		
	Battery Charger	03/10/2026		
	Head Lights Beam Aligner and Tester (Electronic type)	07/10/2026		
	Head Lights Beam Aligner and Tester (Digital type)	08/10/2026		
	Gowler	14/10/2026		
Unit V: Reconditioning/Testing Equipment for Chassis and Body	Brake Efficiency Tester (Chassis Dynamometer)	15/10/2026		
	brake testing equipment Clutch Fixtures	17/10/2026		
	Brake Line Rivetters,	21/10/2026		
	pop riveting gun Crane and Chain Pulley Block	22/10/2026		
	Jack mechanical, hydraulic,	24/10/2026		
	trolley type Paint chamber	28/10/2026		
	Paint Spray Gun Paint Drying Equipment	29/10/2026		
	Tools for tyres, automatic tyre remover, Jib crane,	31/10/2026		
	House test	NOV 01/2026		
	Spring tester. Frame strengthening equipment	11/11/2026		

Use of:

Chassis alignment Equipment Computerized wheel balancer-static and dynamic	12/11/2026		
Computerized wheel alignment equipment,	18/11/2026		
Valve Refacer, Valve Seat Cutting and Grinding,	19/11/2026		
Hydraulic Press Radiator Tester,	21/11/2026		
Cylinder head leakage testing fixture	25/11/2026		
Fuel injector tester, Nozzle cleaning equipment.	26/11/2026		

Assignments

Assignment No	Contents of Syllabus Covered	Proposed Date	Actual Date	Remarks
A-1	Unit-1, Unit-2	21/09/2026		
A-2	Unit-3	09/11/2026		

House Test/Class Test

Name of test	Syllabus for Tests	Proposed Date	Actual Date	Remarks
Class Test -1	Unit-1, Unit-2	As per HPTSB Academic Schedule		
Class Test -2	Unit-3			
House Test	Unit-1 to Unit-4			

(Signature of Teacher)

(Signature of HOD)

Approved
Principal
Govt. Polytechnic Kullu
Distt. Kullu (H.P.)

**Department of Automobile Engineering
Govt. Polytechnic Kullu Dist. - Kullu (H.P.)**

LESSON PLAN

Program Name	Automobile Engineering
Subject Name	Production Process-I
Subject Code	ATPC 211
Semester	3rd
Subject Teacher Name	Manoj Gidani
Evaluation Scheme	N-22

Sr. No	Subject Name	Study scheme (Hrs/Week)		Marks in Evaluation Scheme					
				Internal Assessment			External Assessment		
				Th	Pr	Total	Th	Pr	Total

1.	Production Process-I	4	-	40	-	40	60	-	60
----	----------------------	---	---	----	---	----	----	---	----

Reference Books	Production Technology by R.K.Jain
-----------------	-----------------------------------

Course Outcomes (COs)

CO - 1	Understand the basic principles of thermal engineering, gas laws, and laws of thermodynamics, air cycles and air compressors.
CO - 2	Identify components of hydraulics and pneumatics system. Comprehend different modes of heat transfer.
CO - 3	Understand the basic principles air cycles and their application.
CO - 4	Memorize the principles of Air Compressor and Supercharger.
CO - 5	Know the various aspects of hydraulic and pneumatic.

Tracking Plan

UNITS	Name of Topic	Proposed Date	Actual Date	Remarks
Unit I: Cutting Fluids & Lubricants:	Introduction, Types of cutting fluids,	04/08/2026		
	Fluids and coolants required in turning, drilling, shaping, sawing & broaching.	05/08/2026		
	Selection of cutting fluids, methods of application of cutting fluid.	06/08/2026		
	Classification of lubricants (solid, liquid, gaseous), Properties and applications of lubricants.	07/08/2026		
Unit-I: Lathe Operations:	Lathe Operations: cutting parameters, tool signature.	11/08/2026		
	Types of lathes - light duty, Medium duty and heavy duty	12/08/2026		
	CNC lathe Specifications, Basic parts and their functions;	13/08/2026		
	Operations and tools - Turning, Knurling, facing, Boring, drilling, threading, step turning, taper turning.	14/08/2026		
Unit II: Foundry Practice:	Pattern Making, Types of Pattern, Pattern Materials,	19/08/2026		
	Pattern Allowances	20/08/2026		
	Introduction to Core Moulding: Introduction to	21/08/2026		
	Types of Moulding Sand and their properties;	25/08/2026		
	Melting and pouring, Defect in castings.	26/08/2026		
	Metal forming processes: Die stamping.	27/08/2026		
	Metal Drawing, Spinning.	28/08/2026		
	Rolling, Extruding, Forging, and Tube Drawing.	01/09/2026		
	Processes, Procedures, Advantages, Limitations and Applications of Electro discharge machining,	02/09/2026		
	Electro discharge machining,	03/09/2026		
Unit III: Modern Machining Processes:	Electro chemical Machining,	08/09/2026		
	Electro chemical Machining,	09/09/2026		
	USM,	10/09/2026		
	Class Test-I	11/09/2026		
	USM,	15/09/2026		
	AJM	16/09/2026		
	AJM	17/09/2026		
	LBM	18/09/2026		
	LBM,	22/09/2026		
	Classification, Gas welding techniques, Types of welding	23/09/2026		
	Arc Welding - Principle, Equipment, Applications;	24/09/2026		
	Shielded metal arc welding;	25/09/2026		
	Submerged arc welding.	29/09/2026		
	TIG / MIG welding; Resistance welding;	30/09/2026		
	Spot welding, Seam welding, Projection welding.	01/10/2026		
	Welding defects;	06/10/2026		

Manoj Gidani
21/09/2026

Unit-IV: Welding:	Brazing and soldering: Types, Principles, Applications.	07/10/2026		
	Milling: Introduction, Types of milling machines:	08/10/2026		
	Class Test-II	09/10/2026		
	plan, Universal, vertical;	13/10/2026		
	constructional details - specifications;	14/10/2026		
	Milling operations: simple, compound	15/10/2026		
	differential indexing;	16/10/2026		
	Milling cutters - types; Nomenclature of teeth;	21/10/2026		
	Teeth materials;	22/10/2026		
	Tool signature of milling cutter; - types;	23/10/2026		
	Nomenclature of teeth; Teeth materials;	27/10/2026		
	Tool signature of milling cutter;	28/10/2026		
	Tool & workholding devices.	29/10/2026		
Unit V: Part Programming:	NC part programming - methods - manual programming	30/10/2026		
	House test	NOV 1ST WEEK		
	Format: sequential and word address formats - sequence	10/11/2026		
	- coordinate system - types of motion control:	11/11/2026		
	paraxial and contouring - Datum points: machine zero,	12/11/2026		
	NC dimensioning - reference points	13/11/2026		
	tool material, tool inserts, tool offsets and compensation	17/11/2026		
	NC dimensioning - preparatory functions and G codes,	18/11/2026		
	miscellaneous functions	19/11/2026		
	M codes - interpolation: linear interpolation	20/11/2026		
	circular interpolation,	25/11/2026		
	CNC program procedure.	26/11/2026		
	Revision	27/11/2026		

Assignments

Assignment No	Contents of Syllabus Covered	Proposed Date	Actual Date	Remarks
A-1	Unit-1, Unit-2	27/08/2026		
A-2	Unit-3	23/10/2026		

House Test/Class Test

Name of test	Syllabus for Tests	Proposed Date	Actual Date	Remarks
Class Test -1	Unit-1, Unit-2	As per		
Class Test -2	Unit-3	HPTSB		
House Test	Unit-1 to Unit-4	Academic Schedule		


(Signature of Teacher)


(Signature of HOD)

Approved
Principal
Govt. Polytechnic Kullu
Distt. Kullu (H.P.)

Govt. Polytechnic Kullu (H.P.)
Lesson Plan

Branch : Automobile Engineering

Semester: 3rd

Subject : Mechanical Workshop

Session: Aug. - Nov. -2026

Teacher : Pankaj Kumar

Schenn: N-2022

Subject Code: AEPC 213

Evaluation Scheme

Sr. No	Subject Name	Study scheme (Hrs/Week)		Credit	Marks in Evaluation Scheme			
					Internal Assessment		External Assessment	
		Th	Pr		Th	Pr	Th	Pr
1.	Mechanical Workshop	-	2	1	-	40	-	60

Course Outcomes (COs)

CO - 1	Centre the job and select the proper tool to perform the job on lathe machine.
CO - 2	Calculate the taper angle and practice different taper turning methods on lathe
CO - 3	Prepare the edges for welding and select the suitable electrode, voltage and current.
CO - 4	Operate the welding transformer and generator to perform various weld joint operations.
CO - 5	Prepare various parts or components in CNC.

Teaching Plan

Workshop	Detail of Contents	Proposed Date	Remarks
Turning Workshop	Demonstration and functioning of lathe machine. Names of different parts of machine. Lathe operations, safety measure and practice of starting and stopping of the machine. Practical demonstration by instructor: Holding the round bar, facing at one end, centering and rough turning. Cutting simple threads and knurling.	These Workshops will be carried out as per the individual workshop teaching plan and approved rotation plan.	To be taught by the faculty deputed by nearby ITI/ Polytechnic.
Welding Workshop	One exercise on lap and butt joint each with arc welding. One exercise of vertical and overhead arc welding. One exercise of welding and cutting. One exercise of spot welding. One exercise of TIG welding. One utility article.		To be taught by Sh. Bhupender Singh WSI (Welding)
Machine Workshop	Shaping machine: simple exercise of shaping machine. Milling machine: simple exercise as gear cutting and rack cutting. Drilling: Simple exercise of drilling machine. Grinding: Face grinding and surface grinding.		To be taught by the faculty deputed by nearby ITI/ Polytechnic.
CNC Workshop	One utility job in each machine and develop a part programming in Drilling, Turning, Thread cutting operation. Use of software for milling operation on machine centre.		To be taught by Sh. Pankaj Kumar Workshop Supdt.


Swam Singh
Foreman Instructor


Pankaj Kumar
Workshop Supdt.


Sh. Vivek Singh
HOD (Automobile Engineering)

ENGINEERING WORKSHOP ROTATION PLAN FOR SESSION Aug. - Nov. 2026

BRANCH: AUTOMOBILE ENGINEERING

SEMESTER: 3RD

SUBJECT: MECHANICAL WORKSHOP

GROUP 1

SR. NO.	MONTH	Proposed DATES	CNC W/SHOP	WELDING W/SHOP	REMARKS Actual Dates
1	AUG.	07, 21	GROUP B	GROUP A	
	SEP.	11, 25			
	OCT.	9, 23			
	NOV.	20			
2	AUG.	14, 28	GROUP A	GROUP B	
	SEP.	18			
	OCT.	16, 30			
	NOV.	13, 27			

GROUP A : ROLLNO 1-10

GROUP B : ROLLNO 11-20



Sh. Swarn Singh
FOREMAN INSTRUCTOR



Sh. Pankaj Kumar
WORKSHOP SUPDT.



HOD (Automobile Engg.)

ENGINEERING WORKSHOP ROTATION PLAN FOR SESSION Aug. - Nov. 2026

BRANCH: AUTOMOBILE ENGINEERING

SEMESTER: 3RD

SUBJECT: MECHANICAL WORKSHOP

GROUP 2					
Sr. No.	MONTH	Proposed DATES	CNC W/SHOP	WELDING W/SHOP	REMARKS Actual Dates
1	AUG.	4, 18	GROUP B	GROUP A	
	SEP.	1, 15, 29			
	OCT.	13			
	NOV.	—			
2	AUG.	11, 25	GROUP A	GROUP B	
	SEP.	8, 22			
	OCT.	6, 27			
	NOV.	17			

GROUP A : ROLLNO 21-30

GROUP B : ROLLNO 31-40



Sh. Swarn Singh
FOREMAN INSTRUCTOR



Sh. Pankaj Kumar
WORKSHOP SUPDT.

Govt. Polytechnic Kullu (H.P.)
Mechanical Workshop Planning

Branch : Automobile Engineering

Semester: 3rd

Subject : Mechanical Workshop (Welding Workshop)

Session: Aug. - Nov. -2020

Teacher: Bhupinder , WSI Welding

Scheme: N-2022

Course Code: ACPC213

No. of Credits : 1(L:9,DCS:0,P:2)
(Teaching Load)

Workshop	Month	Week	Detail of Contents	Remarks
Welding Workshop	Aug.	Week 2	i) Demonstration of different welding tools / machines.	
		Week 3		
		Week 4		
		Week 5		
	Sep.	Week 1	One exercise on lap and butt joint each with arc welding.	
		Week 2		
		Week 3	One exercise of vertical and overhead arc welding.	
		Week 4		
		Week 5		
	Oct.	Week 1	One exercise of welding and cutting. One exercise of spot welding. One exercise of TIG welding.	
		Week 2		
		Week 3		
		Week 4		
		Week 5		
	Nov.	Week 1	One utility article Report Checking and evaluation Report Checking and evaluation	
		Week 3		
Week 4				
Week 5				


Sh. Bhupender Singh
Signature of Teacher


Sh. Swarn Singh
Foreman


01/08/2020
Sh. Pankaj Kumar
Workshop Supdt.


01/05/2020
Sh. Vivek Singh
H.O.D.(Automobile Engg.)

Govt. Polytechnic Kullu (H.P.)
Mechanical Workshop Planning

Branch : Automobile Engineering

Subject : Mechanical Workshop (CNC Workshop)

Teacher: Pankaj Kumar, Workshop Supdt.

Course Code: ACPC213

Semester: 3rd

Session: Aug. - Nov. -2026

Scheme: N-2022

No. of Credits : 1(L:0,DCS:0,P:2)
 (Teaching Load)

Workshop	Month	Week	Detail of Contents	Remarks
Welding Workshop	Aug.	Week 2 Week 3 Week 4 Week 5	Demonstration of conventional Lathe, Milling and Drilling Machine. Its Parts, Principal and Working	
	Sep.	Week 1 Week 2 Week 3 Week 4 Week 5	G and M code for: Lathe job Milling job Drilling job	
	Oct.	Week 1 Week 2 Week 3 Week 4 Week 5	Demonstration of different CNC controllers through CNC Simulator. Execution of program in the controller in the lab.	
	Nov.	Week 1 Week 3 Week 4 Week 5	One utility job in each machine and develop a part programming in Drilling, Turning, Thread cutting operation. Use of software for milling operation on machine centre.	


 Sh. Pankaj Kumar
 Workshop Supdt.


 Sh. Vivek Singh
 H.O.D.(Automobile Engg.)

Department of Automobile Engineering
Govt. Polytechnic Kullu Distt. - Kullu (H.P.)

LESSON PLAN

Program Name	Automobile Engineering
Subject Name	Automobile Workshop Practice-I
Subject Code	AEPC 215
Semester	3rd
Subject Teacher Name	Rishav
Evaluation Scheme	N-22

Sr. No	Subject Name	Study scheme (Hrs/Week)		Marks in Evaluation Scheme					
				Internal Assessment			External Assessment		
		Th	Pr	Th	Pr	Total	Th	Pr	Total
1.	Automobile Workshop Practice-I	-	4	-	40	40	-	60	60

Course Outcomes (COs)

CO - 1	Identification of various tools used in automobile
CO - 2	Identify and servicing of the automobile components.
CO - 3	Dismantling and assembling of AC fuel pump, radiator etc.
CO - 4	Servicing of gearboxes, steering etc.
CO - 5	Job on body paneling using spot welding/riveting.

Teaching Plan

Practicals	Name of Practicals	Proposed	Actual Date	Remarks
Practical 1	Identification and sketching of special tools and gauges such as cylinder dial gauge, inside & outside micrometer, telescopic gauge, compression gauge, Vernier caliper, height gauge of automobile workshop and practice to use	05-08-2026		G1
		07-08-2026		G2
Practical 2	Identify and servicing of the components of single plate clutch and Multiplate clutch, removal of worn out parts, adjustment of clutch pedal free play and release lever	10-08-2026		G1
		14-08-2026		G2
Practical 3	Servicing and overhauling of gear boxes: sliding mesh, constant mesh and synchromesh gear box.	17-08-2026		G1
		21-08-2026		G2
Practical 4	Servicing and overhauling of rear axle, differential units and adjustment of backlash.	19-08-2026		G1
		22-08-2026		G2
Practical 5	Servicing and Replacement of brakes - mechanical, hydraulic brakes and power brakes adjustments - bleeding	24-08-2026		G1
		28-08-2026		G2
Practical 6	Overhauling of wheels, tyres and suspension system of car/jeep.	26-08-2026		G1
		29-08-2026		G2
Practical 7	Identification of various denting and painting tools	31-08-2026		G1
		05-09-2026		G2
Practical 8	Cleaning, greasing, checking as per maintenance schedule, washing, wiping and polishing of jeep/car and two wheeler.	07-09-2026		G1
		11-09-2026		G2
Practical 9	Removing dents on body and minor body repairs - body trimming and painting. Dismantling and assembly of water	14-09-2026		G1
		19-09-2026		G2
Practical 10	Servicing of Lubrication system: Flushing, crank case cleaning and replacing oil, filter element.	21-09-2026		G1
		26-09-2026		G2
Practical 11	Servicing of fuel system: petrol feed system, cleaning and flushing fuel tank.	28-09-2026		G1
		03-10-2026		G2
Practical 12	Removal and fitting of wheels and tyres of a two wheelers and repairing of punctures and notation of tyres pressure, use of gauges.	05-10-2026		G1
		09-10-2026		G2
Practical 13	Job on body paneling using spot welding riveting.	07-10-2026		G1
		17-10-2026		G2

Practical 14	Inside and outside inspection/checking of vehicle, checking of engine oil, horn, starter, cooling water before starting of engine.	12-10-2026		G1
		24-10-2026		G2
Practical 15	Identification dismantling and assembling of AC fuel pump.	19-10-2026		G1
		31-10-2026		G2
Practical 16	Soldering of defective radiator and brazing of a fuel tank	28-10-2026		G1
		13-11-2026		G2
Practical 17	Flushing out water jackets, cleaning of radiator and refitting in vehicle, adjustment of fan belt tension by self-adjusting and automatic adjusting.	16-11-2026		G1
		21-11-2026		G2



(Signature of Teacher)



(Signature of HOD)

Approved
Principal
Govt. Polytechnic Kullu
Distt. Kullu (H.P.)

Department of Automobile Engineering
Govt. Polytechnic Kullu Dist. - Kullu (H.P.)

LESSON PLAN

Program Name	Automobile Engineering
Subject Name	Introduction to Computer Aided Drafting
Subject Code	AEPC 217
Semester	3rd
Subject Teacher Name	Maneet Gulania
Evaluation Scheme	N-22

Sr. No	Subject Name	Study scheme (Hrs/Week)		Marks in Evaluation Scheme					
				Internal Assessment			External Assessment		
		Th	Pr	Th	Pr	Total	Th	Pr	Total
1.	Introduction to Computer Aided Drafting	-	4	-	40	40	-	60	60

Course Outcomes (COs)

CO - 1	Understand the representation of materials used in Automotive drawing.
CO - 2	Draw the development of surfaces for sheet metal working applications.
CO - 3	Draw the Automotive elements including connecting rod and other engine components.
CO - 4	Construct an assembly drawing using part drawings of Automotive Components.
CO - 5	Construct the 3D geometry for small parts and other 3D operation.

Teaching Plan

Content	Name	Proposed Date	Actual Date	Remarks
THEORY:1	Introduction to CAD: Advantages, applications, and setting the drawing environment.	03-08-2026		G1
		05-08-2026		G2
	2D Drawing entities (Point, Line, Arc, Circle, etc.) and Object Selection using OSNAP.	28-08-2026		G1
		20-08-2026		G2
THEORY:2	Editing commands: Selection, Copy, Move, Scale, Rotate, Fillet, Chamfer, Mirror, Array, etc.	11-09-2026		G1
		03-09-2026		G2
	Drawing Display Methods (Zoom, Pan, View) and Adding Texts and Dimensions.	18-09-2026		G1
		16-09-2026		G2
THEORY:3	Productivity of Drawing: Pedit, layers, Hatch, and creating line types library.	21-09-2026		G1
		24-09-2026		G2
Practical 1	Preparing the schematic drawing of a workshop building using multiple layers.	25-09-2026		G1
		01-10-2026		G2
Practical 2	Advanced Cad Features: Drawing 2D complex shapes, Extruding to 3D, viewing, and Ortho projection.	05-10-2026		G1
		08-10-2026		G2
Practical 3	Advanced 3D Features: Model/paper space, UCS, 3D editing (Union, Subtraction), and Basic 3D entities.	12-10-2026		G1
		15-10-2026		G2
Practical 4	Drawing of Automobile component: Four Stroke Petrol Engine Piston	19-10-2026		G1
		22-10-2026		G2
Practical 5	Drawing of Automobile component: Diesel Engine Piston	30-10-2026		G1
		29-10-2026		G2
Practical 6	Drawing of Automobile component: Connecting rod	09-11-2026		G1
		11-11-2026		G2
Practical 7	Drawing of Automobile component: Fuel injector	16-11-2026		G1
		18-11-2026		G2
Practical 8	Drawing of Automobile component: Crank shaft - 4 cylinder Engine	23-11-2026		G1
		25-11-2026		G2


 (Signature of Teacher)


 (Signature of HOD)

Approved
 Principal
 Govt. Polytechnic Kullu