Government Polytechnic Kullu at Seobagh Distt Kullu H.P. 175138

Department of Automobile Engineering

Lesson Plan w.e.f 27-01-2025 to 25-05-2025

Name of Subject:-	**Elements of Strength of Material**	Session:-	**Jan-May 2025**
Name of Teacher:-	**Er Maneet Guleria**	Semester:-	**4th Semester**
Designation:-	**Workshop Supdt. (Automobile Engg)**	Scheme:-	**N-2022**

Sr No	Month	Week	Contents	Remarks
1	January	Week 5	**Unit I: Stresses and strains:** Introduction to stress and strain,tensile and compressive stress.	
2	February	Week 1	Shear stress and strain. Hook's law and Young's Modulus of elasticity, Modulus of Rigidity, Poisson's ratio, Bulk Modulus,	
		Week 2	Deformation and stress in uniform bar. Deformation and stress in non-uniform bar, Longitudinal and hoop stress in thin cylinders.	
		Week 3	**Unit II: Beam and Bending**: Concept of Beam and their types (simply supported,overhanging, cantilever),	
		Week 4	Different types of supports,	
3	March	Week 1	Concept of bending moments and shear force. B.M and S.F. diagram for Beams; for uniformly distributed and concentrated loads.	
		Week 2	Determination of position of maximum B.M and S.F. in beam. Point of contra flexure.	
		Week 3	**Class Test -I**	
		Week 4	**Unit III: Bending and Shear Stresses:** Concept of simple bending, assumptions made in it and derivation of bending equation, Concept of Second Moment of Area	
4	April	Week 1	Section Modulus for simple sections: Rectangle cross section, Circular cross section, Triangular cross section. Hollow circular cross section.	
		Week 2	Calculation of bending stresses for the above section with given loading and span.	
		Week 3	**Class Test -II**	
		Week 4	**Unit IV: Springs:** Leaf Springs, Maximum deflection in leaf springs, Maximum stress in leaf springs, close coiled and open coiled springs subjected to axial load and axial twist	
		Week 5	Stiffness of a spring, Strain energy and proof resistance.**Unit V: Shaft Design & Columns:** Concept of torque and angle of twist,	
5	May	Week 1	Derivation of Torsion equation. Calculation of Torque transmitted by hollow and solid shafts of round sections Stresses in shaft, Shaft coupling and various types (concept only)	
		Week 2	**House Test**	
		Week 3	Design of shafts (Solid and hollow) Shaft under torsion,	
		Week 4	**Columns:** Long and short columns, Buckling of columns, Euler Formula.	
		Week 5	**Revision**	

Signature of Teacher
(Er Maneet Guleria)

Signature of H.O.D
(Er Vivek Singh)

Government Polytechnic Kullu at Seobagh Distt Kullu H.P. 175138					
Department of Automobile Engineering					
Lesson Plan w.e.f 27-01-2025 to 25-05-2025					
Name of Subject:-	Elements of Strength of Material Lab		Session:-	Jan-May 2025	
Name of Teacher:-	Er Maneet Guleria		Semester:-	4th Semester	
Designation:-	Workshop Supdt. (Automobile Engg)		Scheme:-	N-2022	

Sr No	Month	Week	Contents	Remarks
1	January	Week 5	To study tensile behavior of three different metals.	
2	February	Week 1	To study tensile behavior of three different metals.	
		Week 2	To study tensile behavior of three different metals.	
		Week 3	To calculate shear strength of two different metal under single and double shear.	
		Week 4	To calculate shear strength of two different metal under single and double shear.	
3	March	Week 1	Test on a spring to find out spring constant of the spring.	
		Week 2	Calculation of impact strength of metals by, 1.Charpy test 2. Izod test	
		Week 3	To calculate bending strength by performing bending	
		Week 4	To calculate torsion strength of 3 different metals by torsion test.	
4	April	Week 1	To calculate torsion strength of 3 different metals by torsion test.	
		Week 2	To calculate hardness of metals by Rockwell hardness test.	
		Week 3	Study of a reciprocating pump.	
		Week 4	Study of a centrifugal pump.	
		Week 5	Verification of Bernoulli's theorem.	
5	May	Week 1	Measurement of flow with Venturi meter & Orifice meter	
		Week 2	**House Test**	
		Week 3	**Revision**	
		Week 4	**Revision**	
		Week 5	**Revision**	

Signature of Teacher
(Er Maneet Guleria)

Signature of H.O.D
(Er Vivek Singh)

GOVT. POLYTECHNIC KULLU

LESSON PLAN

Name of Teacher: Er. Rishav
Name of Subject: ACBT-II

Branch: Auto Engg.
Sem: 4th

SR.NO	MONTH	WEEK	CONTENTS	REMARKS
1	January & February	5th, 1st, 2nd & 3rd	**Suspension System** Function type - independent, rigid axle. Springs, functions, and types (coil, leaf and torsion bar), sprung and un-sprung weight, Characteristics of springs, material, spring eye, bushes, variable rate spring, helper leafs, leaf sections. Camber grading and nippling spring seats, rubber pads, pressure blocks, spring covers; inter leaf inserters, pneumatic suspension system. Function and construction of hydraulic dampers (shock absorbers), active suspension system and diagnosis of common faults and their rectifications.	
2	February & March	5th, 1st, 2nd, & 4th	**Braking System** Purpose of brakes, lay out of braking system, components, Types of brakes- mechanical, hydraulic, power. Principle of hydraulic brakes, braking action, master cylinder, wheel cylinder, leading and trailing shoes, self-adjusting brakes. Drum brakes - construction and working details. Disc brakes - constructional and working details. **Power Brakes**: Air, air hydraulic, hydraulic vacuum their construction and working details. Brake fluid and characteristics, brake liner, hand brake, engine exhaust brake system and its importance, brake tests, antilock braking system with electronic brake distribution, common faults and their rectification.	
3	March & April	5th, 1st, 2nd, & 4th	**Wheel and Tyres** Wheels, types, hub attachment, wheel specification, tyres classification and purpose, types and construction of pneumatic tyre, causes of excessive tyre wear, effects of different condition of vehicles stability. Care and maintenance of tyres, tubes, retreading of tyres, tubeless tyres, Run flat tyres, concept of green tyres, wheel.	

4	April & May	5th, 1st & 3rd	**Automotive Safety Systems** Preventive design, designing for minimum injury in accident, seat belts, seat belt pre-tensioner with load limiter, airbags, electronic vehicle stability (traction control system, Hill Hold) and occupants protection system, pedestrian protection, isocar seat fix, child-lock.	
5	May	4th & 5th	**Miscellaneous** SHVS system, lane departure warning, adaptive cruise control, automatic emergency braking system, 360º degree camera	

27/01/2025

Er. Rishav
Lecturer Automobile Engg.

HOD
Automobile Engg.Deptt.

Department of Automobile Engineering					
Lesson Plan w.e.f 27-01-2025 to 25-05-2025					
Name of Subject:-	Auto Engine		Session:-	Jan-May 2025	
Name of Teacher:-	Er Maneet Guleria		Semester:-	4th Semester	
Designation:-	Workshop Supdt. (Automobile Engg)		Scheme:-	N-2022	

Sr No	Month	Week	Contents	Remarks
1	January	Week 5	**Unit I: Introduction:** Engines, internal and external combustion Engines, Engine terminology including Bore, Stroke, dead centres, Compression Ratio, Swept volume, clearance volume, compression ratio, Engine capacity, Engine torque, Indicated power, Brake power, Friction power	
2	February	Week 1	Classification of engines as per stroke, cycle, fuel, ignition, cooling, speed, number and arrangement of cylinders, governing, reciprocating and rotary.	
		Week 2	Concept of 2-stroke and 4- stroke engines and their comparison. **Unit II: Engine Components:** Construction details, specification, function and working of components, cylinder block, head	
		Week 3	cylinder liner, piston, piston rings, wrist pin, connecting rod, crankshaft bearing, camshaft, valves and valves mechanisms. Fly wheel and dampers.	
		Week 4	**Unit III: IC Engine Testing:** Testing of I.C. engine and determination of Indicated Power and Brake Power. Mechanical Efficiency, Volumetric efficiency, Thermal Efficiency, Relative Efficiency, Mean Effective Pressure and Specific fuel consumption	
3	March	Week 1	Heat balance sheet, Morse Test. Simple numerical problems.	
		Week 2	**Unit IV: Fuel System in spark Ignition Engine:** Fuel System: types of fuel feed system, gravity and pump feed. Fuel injection system, Fuel tank, fuel lines, fuel filters	
		Week 3	**Class Test -I**	
		Week 4	carburetion, working of simple carburetor and its limitation.	
4	April	Week 1	Petrol Injection: Introduction, Comparison with Carburetor method, Description and working of multipoint fuel injection (M.P.F.I.), Advantages and disadvantages of M.P.F.I., Sensors and construction of ECU.	
		Week 2	**Ignition system:** Concept of ignition system, types of ignition systems, Battery/coil and magneto ignition system, Function and working of ignition coil, distributors,	
		Week 3	**Class Test -II**	
		Week 4	condenser, advance mechanisms, C.B. Point and gap, spark plugs and gaps pertaining to Indian vehicles, Distributor less Ignition System, transistorized ignition system.	
		Week 5	**Unit V: Cooling System and lubrication System:** Cooling system: necessity, types (air, water), pump circulation cooling., Advantages & Disadvantages of Air cooling &water cooling,	
5	May	Week 1	Components of Water cooling system- Radiators, thermostat, water pump, Fan, Pressure cap, Water jackets, anti-freeze solution, trouble shooting and remedies.	
		Week 2	**House Test**	
		Week 3	**Lubrication System:** Necessity and types of Lubrication system (Splash System, Pressure system), Wet and dry sump, Components used, oil pump, oiliness,	
		Week 4	oil filters, oil coolers, crankcase ventilation, characteristics, classification and service ratings of lubricating oil, additives for Lubricants.	
		Week 5	Revision	

Teacher's references. AutomobileEngineering-Vol.2 by Dr. Kirpal Singh; Standard Publishers Distributors

Signature of Teacher
(Er Maneet Guleria)

Signature of H.O.D
(Er Vivek Singh)

Govt. Polytechnic Kullu (H.P.)

Lecture Planning

Branch : **Automobile Engineering** Semester: **4th**

Subject: **Tractor & Farm Equipment** Session: **Jan - May, 2025**

Teacher: **Pankaj Kumar**

Sr. No.	No. of Lectures	Month	Week	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1.	8	**Feb.**	Week 1 Week 2 Week 3 Week 4	Tractor and Tractor Theory	Unit- I: Tractor and Tractor Theory: 1.1 Classification of tractors 1.2 main tractor assemblies 1.3 functions on farm tractors 1.4 types of engine used,Horse power requirement, 1.5 human factor in tractor design. 1.6 Prominent Indian makes tractors, 1.7 specifications, selection, maintenance and operation of tractors. 1.8 Basics trends in tractor design 1.9 forces acting on a tractor on move, parallel pull and rolling resistance, 1.10 tractor stability and weight distribution.	R1,R2	
2.	8	**March**	Week 1 Week 2	Hydraulic System and Tractor Chassis	Unit- II: Hydraulic System and Tractor Chassis 2.1 Functions of hydraulic system, hydraulic components, 2.2 methods of attaching implements 2.3 classification of hydraulic controls for hitches, 2.4 integral hitch system, 2.5 three point hitches, 2.6 draft control system. 2.7 Salient features of engine, clutch, power transmission, 2.8 Salient features of final drive, brakes and steering 2.9 Power take off shaft 2.10 draw bar working and belt pulley	R1,R2	
3.	4	**March**	Week 3 Week 4	Tractor Wheels and Tyres	Unit III: Tractor Wheels and Tyres: 3.1 Salient features of wheels and tyres, 3.2 specifications of wheels and tyres, 3.3 dual versus tandom tyres, 3.4 tread design 3.5 effect of tyre inflation.	R1,R3	

4.	10	**April**	Week 1 Week 2 Week 3 Week 4	Agricultural Equipment	Unit- IV: Agricultural Equipment: 4.1 Types of agriculture equipment 4.2 trailer and mounted types 4.3 description and working principles of ploughs, 4.4 single plough 4.5 disc plough 4.6 tiller, 4.7cultivator 4.8 reaper, winnowers, 4.9 binder, thrasher, 4.10 pumps, sprayers and attachments.	R1,R2,R3	
5.	5	**May**	Week 1 Week 3 Week 4	Repair and Maintenance	Unit- V: Repair and Maintenance: 5.1 Faults and their rectification in tractor 5.2 Faults and their rectification in farm equipment. Revision	R1,R2	

Teacher's references.

R1. Farm machines and equipment byC.P. Nakra, Dhanpat Rai and Sons.
R2. Manual of Tractors by Joachian Konard, Asia Publishing house.
R3. Tractors and Agriculture Equipment byJain and Roy.

Signature of Teacher with Date

Signature of H.O.D.

Government Polytechnic Kullu at Seobagh Distt Kullu H.P. 175138					
Department of Automobile Engineering					
Lesson Plan w.e.f 27-01-2025 to 25-05-2025					
Name of Subject:-	Motor Vehicle Act & Transport Management		Session:-	Jan-May 2025	
Name of Teacher:-	Er. Vivek Singh		Semester:-	4th Semester	
Designation:-	Head of Department		Scheme:-	N-2022	

Sr No	Month	Week	Contents	Remarks
1	January	Week 5	**Unit-I: Motor Vehicle Act:** Definition and provisions (Salient features of M.V. Act 1988)Requisites and formalities for following: Different forms, application for various Uses ,	
2	February	Week 1	Registration of old and new vehicles, Private and commercial vehicle, Transfer of vehicle: Local and State to State.	
		Week 2	Registration of old and new vehicles, Private and commercial vehicle,	
		Week 3	Transfer of vehicle: Local and State to State.**Unit- II: Inspection, Fitness and Insurance of Vehicle:** Fitness of vehicle, Private and Commercial Different types of permits, Permit consideration for transport andpublic service and tourist permit.	
		Week 4	Insurance: Different types of insurance and policies, Procedure to get Accidental claim and compensation, Surveyor duties, Relations between company and surveyor,	
3	March	Week 1	MACT (Motor accident claims tribunal).**Unit III: Driving and Road Safety:** Driving License,	
		Week 2	Different types of driving licenses, Procedure to get license, Private, commercial, invalid, international license,	
		Week 3	**Class Test -I**	
		Week 4	Principle of Driving, Driving precautions.Driving in abnormal conditions: Like Hilly, night, fog, typhoon, heavy traffic, rainy,	
4	April	Week 1	Road Safety: Road Signs, Imposition of Penalties for violation, Act and Articles, Duties of Driver, Duties of conductor.	
		Week 2	**Unit- IV: Pollution Control:** Different contents of exhaust gas,	
		Week 3	Class Test -II	
		Week 4	Prescribed standards for vehicles: bharat stage norms, Method of Control of pollution for SI and CI engines	
		Week 5	Fuel efficiency. **Unit- V: Transport Management:** Structure of fleet organization, State transport,	
5	May	Week 1	optimum utilization of fleet, Road worthiness requirement, Maintenance of log book, History sheet,	
		Week 2	House Test	
		Week 3	causes and prevention of: Road Accident Analysis of Accident, Economy of replacement,	
		Week 4	Assessment of used vehicles for sale and purchase, Automotive Associations in India.	
		Week 5	**Revision**	

Signature of Teacher
(Er Vivek Singh)

Signature of H.O.D
(Er Vivek Singh)

GOVT. POLYTECHNIC KULLU

LESSON PLAN

Name of Teacher: Er. Rishav
Name of Subject: AWP-II

Branch: Automobile Engg.
Sem: 4th

Sr.No.	Name of Practicals	Month	Week	Remarks
1	Replacement and Servicing of steering system - steering gear boxes correction, adjustment of free play.	January	5th	
2	Checking and adjustment of camber, caster, toe in and toe out, king pin inclination in steering geometry.	January	5th	
3	Replacement and Servicing of suspension system - leaf springs, independent suspension – coil spring - torsion bar, telescopic shock absorber	February	1st & 2nd	
4	Wheel balancing - static and dynamic.	February	2nd	
5	Dismantling and assembly of oil pumps.	February	3rd	
6	Flushing out water jackets, cleaning of radiator and refitting in vehicle, adjustment of fan belt tension by self-adjusting and automatic adjusting.	February	3rd	
7	Painting job on Vehicle Components.	February	4th	
8	Dismantling and assembly of injectors.	February	4th	
9	Practice in complete servicing of a vehicle i.e. engine oil, Gear oil fuel filter, oil filter replacement, Coolant, Air filter, Cabin AC filter etc. as per maintenance schedule of the vehicle.	February	5th	
10	Fault tracing of different sensors through engine car scanner.	March	1st	
11	Fault tracing of supplementary restraint system (SRS).	March	2nd	
12	Study of ABS, traction control system model.	March	4th	

13	Programming through teach pendant of Industrial robot.	March	5th	
14	Setting of engine timing, valve clearance and adjustment of tappet clearance (Engine Tune-up)	April	1st	
15	Dismantling and assembly of fuel injection pump.	April	2nd	
16	Demonstration of CRDI or MPFI System used in modern vehicle using engine scanner.	April	4th	
17	Servicing feed pump: mechanical pump, electrical pump and testing.	April	5th	
18	Trouble shooting of engine : Diagnosing and rectifying to the following troubles - Engine overheating, high oil consumption, engine noises and knocks, high fuel consumption, starter turns the engine on but the engine does not start, engine fires but dies out, engine misfires, lack of power, poor acceleration, engine produces black or white smoke.	May	1st	
19	Practice of cylinder ridge removing using ridge cutter and alignment of connecting rod.	May	3rd	
20	Practice of fitting cylinder liner – sleeving and de-sleeving.	May	4th	
21	Engine testing and finding out fuel consumption, Engine output and efficiency using engine test rig (Petrol/Diesel).	May	5th	

Er. Rishav 23/01/2025
Lecturer Automobile Engg.

HOD
Automobile Engg.

Government Polytechnic Kullu at Seobagh Distt Kullu H.P. 175138

Department of Automobile Engineering

Lesson Plan w.e.f 27/01/2024 to 25/05/2024

Name of Subject:- **Minor Project** Session:- **Jan-May 2025**

Name of Teacher:- **Er. Pankaj Kumar & Er Maneet** Semester:- **4th Semester**

Designation:- **W/Supdt.** Scheme:- **N-2022**

Sr No	Month	Week	Contents	Remarks
1	January	Week 5	1. Identification of a real life problem in thrust areas.	
2	February	Week 1	1. Identification of a real life problem in thrust areas.	
		Week 2	1. Identification of a real life problem in thrust areas.	
		Week 3	1. Identification of a real life problem in thrust areas.	
		Week 4	2. Developing a model for solving the problem.	
3	March	Week 1	2. Developing a model for solving the problem.	
		Week 2	2. Developing a model for solving the problem.	
		Week 3	3. Finalization of requirements.	
		Week 4	3. Finalization of requirements.	
4	April	Week 1	3. Finalization of requirements.	
		Week 2	4. Proposing different solutions for the problems based on survey.	
		Week 3	4. Proposing different solutions for the problems based on survey.	
		Week 4	4. Proposing different solutions for the problems based on survey.	
		Week 5	5. Future trends in providing alternate solutions.	
5	May	Week 1	5. Future trends in providing alternate solutions.	
		Week 2	**House Test**	
		Week 3	6. Consolidated report preparation of the above.	
		Week 4	6. Consolidated report preparation of the above.	
		Week 5	6. Consolidated report preparation of the above.	

Signature of Teacher
(Er Pankaj Kumar)
(Er Maneet Guleria)

Signature of H.O.D
(Er Vivek Singh)

Name of Faculty	Lekh Raj Sharma
Discipline	Civil,Electrical & Automobile Engg 4th Semester
Semester	4th
Subject	Essence of Indian Knowledge and Tradition
Lesson Plan Duration	Jan. – May 2025

Week	Chapter	Topic to be covered
1st (27Jan. – 01Feb.)	Unit – 1 Unit 1: Indian Knowledge System (IKS):	25% Marks Introduction and Function of Indian Knowledge System (IKS).• The Basic Structure of Indian Knowledge System (IKS) (only Introduction)• 1. The 4 Vedas, Namely (Rigveda), (Yajurveda), सामवेद (Samaveda), अथववेद (Atharvaveda) . 2. The 4 UpVedas, namely (Ayurveda (healthcare)), (Dhanurveda (archery)), गंधववेद (Gandharva-veda (dance, music etc.)) and स्थापत्यवेद (Sthapatyaveda (architecture)).
2nd (02Feb. – 08Feb.)	Unit 1: Indian Knowledge System (IKS):	Signals: DC/AC, voltage/current, periodic/non- periodic signals, average, rms, peak values, different types of signal waveforms,
3rd (09Feb. – 15Feb.)	Unit 1: Indian Knowledge System (IKS):	3. The 6 Vedagangs, namely Shiksha ( ), Kalpa ( ), Vykarana ( ), Chhandas), Nirukta ( ), and Jyotisha (ज्योतिष)
4th (16Feb. – 22Feb.)	Unit 1: Indian Knowledge System (IKS):	4. Itihasa (इतिहास) (Ramayana and Mahabharata महाभारि) and Purana (Vishnupurana तवष्णुपुराण, Bhagavata Purana (भागवि) etc.)
5th (23Feb. – 01Mar.)	Unit 1: Indian Knowledge System (IKS):	5. Dharmashastra धमवशास्त्र (Manusmriti मनुस्मृति, Yajnavalkya-smriti यशावल्क्यस्मृति etc.). 6. Darshan दशवन (िधा). 7. Nyaya (Logic ि र्व शास्त्र) and Epistemology).
6th (02 Mar. – 08Mar.)	Unit 2: Modern science ——	Modern science: Introduction, Characteristics, importance and Example
7th (09Mar. – 15Mar.)	Unit 2: Modern science ——	Role of IKS in modern science•
Class Test – 1		**In Third Week of March 2025.**
8th (23Mar. – 29Mar.)	Unit 3: Traditional Knowledge -	Traditional knowledge: Definition, nature, characteristics, scope and importance Indigenous Knowledge (IK): characteristics•
9th (01Apr. – 05Apr.)	Unit 3: Traditional Knowledge -	Traditional knowledge vis-a-vis indigenous knowledge Traditional knowledge V western knowledge•
10th (06Apr. – 12Apr.)	Unit 3: Traditional Knowledge -	The need for protecting traditional knowledge.
11th (03Apr. – 19Apr.)	Unit 4: Yoga and Holistic Health car	Yoga: Meaning and Importance of Yoga Yoga and physical health, Yoga and psychological health, Yoga and intellectual health, Yoga and• spiritual health, Yoga and social approach.
Class Test – 2		**In Third Week of April 2025.**

(27Apr.– 03May)	Holistic Health car	...to Ashtanga Yoga, Yogic Kriyas (Shat Karma) Pranayama and its types; Active lifestyle and stress management through Yoga• Physical Fitness, Health and wellness: Meaning and Importance of Wellness,• Components of Wellness, Health and physical Fitness•
13th (29Apr.– 05May.)	Unit 4: Yoga and Holistic Health car	Traditional sports & Regional Games for promoting wellness: Leadership through Physical Activity and Sports; Introduction to First Aid.•
House Test		**In Second Week of May 2025.**
14th (11May.– 17 May.)	Unit 5: Himachal Pradesh: A Basic Information	History, Culture, Heritage/ Tradition, Customs & Manners, Regional Knowledge, Geographical Features Constitutional History•
15th (18May-29May)	Unit 5: Himachal Pradesh: A Basic Information	Tourism Place & Scope Festivals and Fair•

- **NOTE:** Lesson Plan is Tentative, subject to availability of Time, Students & Faculty.

05/02/2025

Prepared by
(Lekh Raj Sharma)

05/02/2025

Signature of HOD ASAH
(Mr. LR Sharma)