

LESSON PLAN 2025-26

NAME OF THE TEACHER : ASHIRBAD BABU (GUEST FACULTY, MECHANICAL)

Subject: Theory of Machine (AEPC202 / Th1)

Program: Diploma in Automobile Engineering

Semester: 4th

Total Contact Hours: 45

Total Marks: 100

Assessment: Progressive - 30, End Term - 70

Credits: 3

COURSE OUTCOMES:

CO1: Identify various types of mechanisms and types of links

CO2: Summarize various types of cams and followers

CO3: Classify different types of power transmission devices

CO4: Describe the functioning of brakes and dynamometers

CO5: Discuss the types and functions of clutches.

Class No.	Topic	Sub-Topics	Teaching Aids / Activities	Course Outcome
1	Fundamentals	Introduction to statics, kinematics, dynamics	Chalk & board, PPT	CO1
2	Kinematic Links	Types of links, examples	PPT, real components	CO1
3	Kinematic Pairs	Types of pairs, constrained motion	Models, charts	CO1
4	Kinematic Chains	Types of chains, mechanisms	Blackboard, animations	CO1
5	Mechanisms	Inversions, machines & structures	PPT, numerical problems	CO1
6	Mechanisms	Laws of inversions	Chalk & board	CO1
7	Four Bar Chain	Mechanism & inversions	Models, diagrams	CO1
8	Applications	Pantograph mechanism	Charts, problems	CO1
9	IC Engine Mechanism	Two-stroke engine mechanism	Engine model	CO1
10	Steering Mechanism	Ackermann steering gear	PPT, video	CO1
11	Belt Drives	Types of belts, materials	Samples, PPT	CO3
12	Belt Drive Analysis	Velocity ratio, slip & creep	Blackboard, numericals	CO3
13	Tension in Belts	Initial, centrifugal tension	Problems, PPT	CO3
14	Maximum Power	Condition for max power	Numerical problems	CO3
15	Rope Drives	Types, advantages & uses	Charts	CO3

16	Chain Drives	Elements, characteristics	Real chain model	CO3
17	Gears	Gear terminology & types	Gear samples	CO3
18	Gear Trains	Types & applications	PPT, numericals	CO3
19	Cams & Followers	Definitions & classifications	Models, PPT	CO2
20	Followers	Types & motions	Blackboard diagrams	CO2
21	Follower Motion	Uniform velocity, SHM	Charts, numericals	CO2
22	Acceleration Motion	Uniform accel & retardation	PPT	CO2
23	Applications	Cam mechanisms in engines	Engine camshaft model	CO2
24	Governors	Function & classification	PPT	CO4
25	Watt Governor	Construction & working	Diagrams	CO4
26	Porter & Proell	Working principles	Blackboard	CO4
27	Hartnell Governor	Working & application	PPT	CO4
28	Governor Concepts	Sensitivity, stability, isochronism	Numerical problems	CO4
29	Flywheel	Function & comparison	Charts	CO4
30	Balancing	Static & dynamic balancing	Models, PPT	CO4
31	Reciprocating Parts	Causes & effects of unbalance	Problems	CO4
32	Friction	Types & laws of friction	Blackboard	CO5
33	Bearings	Types of bearings	Bearing samples	CO5
34	Pivot Bearings	Simple & collar bearing	PPT	CO5
35	Conical Pivot	Torque relations	Numerical problems	CO5
36	Clutches	Types & applications	Clutch model	CO5
37	Brakes	Types of frictional brakes	PPT	CO4
38	Simple Brake	Working principle	Blackboard	CO4
39	Brake Calculations	Braking torque & force	Numericals	CO4
40	Dynamometers	Absorption type	Charts	CO4
41	Prony Brake	Construction & working	PPT	CO4
42	Rope Brake	Working & applications	Diagram	CO4
43	Numerical Practice	Mixed problems	Tutorial session	All
44	Conceptual Review	Unit-wise recap	Discussion	All
45	Test / Viva	Internal assessment	Question paper	All

A Babu
22/12/25
Signature of Faculty


Signature of H.O.D.

LESSON PLAN 2025-26

NAME OF THE TEACHER : SAMBIT KUMAR SAHOO, LECT. (STAGE-I, AUTOMOBILE)

Subject: Automobile Engines - I (AEPC204 / Th2)

Program: Diploma in Automobile Engineering

Semester: 4th

Total Contact Hours: 45

Total Marks: 100

Assessment: Progressive - 30, End Term - 70

Credits: 3

COURSE OUTCOMES:

CO1: Discuss various types of auto engines and their specifications

CO2: List various types of automotive fuels.

CO3: Explain the working principle of petrol and diesel engines

CO4: Describe the fuel injection equipment and turbo charging of diesel engines

CO5: Identify the issues related to automobile emission and its control

Class No.	Topic	Subtopic	Teaching Aids / Activities	Course Objective
1	Introduction to Automobile	Indian automobiles, types of automobiles, layout of automobile	PPT, blackboard, automobile charts	CO1
2	Automobile Components	Major components and their functions	Engine model, charts	CO1
3	Classification of Engines	Classification based on use, fuel, cylinders	PPT, discussion	CO1
4	Engine Orientation	Vertical & horizontal engines – merits & demerits	Charts, video	CO1
5	Engine Terminology	TDC, BDC, bore, stroke	Blackboard, diagrams	CO1
6	Engine Performance Terms	IP, BHP, torque, MEP, fuel efficiency	Numerical examples	CO1
7	Two Stroke Petrol Engine	Construction & working principle	Cut-section model, animation	CO3
8	Four Stroke Petrol Engine	Construction & working principle	Engine model, PPT	CO3
9	Two Stroke Diesel Engine	Construction & working principle	Charts, video	CO3
10	Four Stroke Diesel Engine	Construction & working principle	PPT, diagrams	CO3
11	Engine Selection	Two-stroke vs four-stroke engines	Comparative charts	CO1
12	Engine Applications	Single cylinder engines for two-wheelers	Case study	CO1
13	Multi-cylinder Engines	Use in commercial vehicles	Discussion, PPT	CO1
14	Automotive Fuels	Types of fuels & origin	Samples, charts	CO2
15	Fuel Properties	Properties & constituents of fuels	Blackboard, PPT	CO2

16	Fuel Standards	IS specifications & importance	PPT, handout	CO2
17	Octane Number	Octane rating & significance	Numerical examples	CO2
18	Unleaded Petrol	Necessity & identification	Video, discussion	CO2
19	Alternative Fuels	Alcohol, benzole, vegetable oils	PPT, case study	CO2
20	Fuel Additives	Types and functions	Charts, discussion	CO2
21	Petrol Fuel System	Introduction & components	Engine model	CO3
22	Gravity Feed System	Construction & working	Diagrams, PPT	CO3
23	Fuel Pumps	Types & working	Cut model, video	CO3
24	Air-Fuel Mixture	Properties & engine requirements	Blackboard	CO3
25	Carburetors	Throttle valve carburetor	Charts, discussion	CO3
26	Petrol Injection System	Types & classification	PPT	CO3
27	MPFI System	Advantages & applications	Video, discussion	CO3
28	Diesel Combustion	Properties of diesel fuel	Blackboard	CO4
29	Combustion Process	CI engine combustion stages	PPT, diagrams	CO4
30	Diesel Knock	Causes & effects	Video, discussion	CO4
31	Combustion Chambers	Types of CI combustion chambers	Charts	CO4
32	Open Chamber	Construction & working	Diagrams	CO4
33	Pre & Turbulence Chamber	Construction & working	PPT	CO4
34	Fuel Injection System	Introduction & layout	Model, charts	CO4
35	Injection Pumps	Types & working	Cut model	CO4
36	Diesel Injectors	Construction & operation	PPT, diagrams	CO4
37	Governor	Function & types	Blackboard, model	CO4
38	Turbocharging	Location, construction & working	Animation video	CO4
39	Supercharging	Construction & working	PPT	CO4
40	Turbo vs Supercharger	Comparison	Comparative chart	CO4
41	Emission Issues	Engine emissions & effects	PPT, discussion	CO5
42	Emission Control	Control techniques	Video	CO5
43	Revision	Units I-III	Question-answer session	All COs
44	Revision	Units IV-VI	Problem solving	All COs
45	Evaluation	Class test / viva	Test papers	All COs

Alahud
22/12/25

Signature of Faculty

[Handwritten Signature]

Signature of H.O.D.

LESSON PLAN 2025-26

NAME OF THE TEACHER : KUMAR GYANADEEP, LECT. (STAGE-II, AUTOMOBILE)

Subject: Automotive Transmission (AEPC206 / Th3)

Program: Diploma in Automobile Engineering

Semester: 4th

Total Contact Hours: 45

Total Marks: 100

Assessment: Progressive - 30, End Term -70

Credits: 3

COURSE OUTCOMES:

At the end of the course, the student will be able to know :

CO1:Functions, types, requirements & adjustment of clutch.

CO2:Function, types & operation of gearbox.

CO3:Functions of propeller shaft & types of joints

CO4:Functions & types of differentials.

CO5:Types & operation of real axel.

CO6:Transmission of power in two-wheelers.

Class No.	Topic	Subtopic	Teaching Aids / Activities	Course Objective
1	Introduction to Clutch	Need & functions of clutch	PPT, chalk & board, real clutch images	Understand purpose and necessity of clutch
2	Requirements of Clutch	Clutch requirements & characteristics	PPT, discussion	Identify design requirements of clutch
3	Types of Clutch	Single plate, multi-plate, centrifugal clutch	Charts, videos	Explain various clutch types
4	Clutch Construction	Components, clutch facing	Cut section diagrams, models	Understand constructional details
5	Clutch Operation	Working principle of clutch	Animation/video	Explain working of clutch
6	Clutch Problems	Common faults, adjustment, fluid flywheel & coupling	Case study, Q&A	Diagnose clutch problems and adjustments
7	Gearbox Introduction	Functions & types of transmission	PPT, diagrams	Understand gearbox functions
8	Sliding Mesh Gearbox	Construction & working	Charts, animations	Explain sliding mesh gearbox
9	Constant Mesh Gearbox	Construction & working	PPT, cut section diagrams	Understand constant mesh gearbox
10	Epicyclic Gearbox	Overdrive & free-wheel drive	Video, models	Explain epicyclic gearbox
11	Selector Mechanism	Gear selection methods	Chalk & board	Understand gear selection
12	Fluid Torque Converter	Construction & working	Animation, video	Understand fluid coupling operation
13	Propeller Shaft	Definition & functions	PPT, diagrams	Understand role of propeller shaft
14	Types of Propeller Shaft	Single, two-piece shaft	Charts	Identify types of propeller shaft
15	Universal Joints	Types & working	Models, video	Explain universal joint operation

16	Sliding Joint	Construction & need	PPT	Understand sliding joint
17	Applications	Practical applications	Discussion	Apply concept in vehicles
18	Review & Test	Unit review	Short test	Reinforce learning
19	Differential	Function & necessity	PPT, diagrams	Understand need of differential
20	Types of Differential	Open, limited slip, etc.	Charts	Identify differential types
21	Construction	Differential components	Cut section diagrams	Understand construction
22	Working Principle	Power distribution	Animation	Explain working
23	Inspection	Study & inspection procedure	Practical discussion	Understand inspection methods
24	Unit Test	Differential	Test & discussion	Assess understanding
25	Rear Axle	Definition & functions	PPT	Understand rear axle
26	Supporting of Rear Axle	Semi-floating, full-floating	Charts	Explain axle support types
27	Rear Axle Drives	Hotchkiss, torque tube	Diagrams	Understand drive mechanisms
28	Types of Rear Axle	Live & dead axle	PPT	Identify axle types
29	Rear Axle Casing	Construction	Charts	Understand casing design
30	Review	Unit discussion	Q&A	Reinforce concepts
31	Moped Transmission	Power flow	PPT	Understand moped transmission
32	Scooter Transmission	CVT system	Video	Explain scooter transmission
33	Motorcycle Transmission	Gear & chain drive	Diagrams	Understand motorcycle transmission
34	Bullet Transmission	Power transmission system	PPT	Explain bullet transmission
35	Comparison	Two-wheeler systems	Discussion	Compare systems
36	Unit Test	Two-wheeler	Test	Evaluate learning
37	Vehicle Performance	Propulsion power	PPT	Understand vehicle performance
38	Resistances	Rolling, air resistance	Chalk & board	Identify resistances
39	Traction	Tractive effort	Numerical problems	Calculate traction
40	Road Performance Curves	Interpretation	Graphs	Analyze performance curves
41	Acceleration	Gradability & drawbar pull	PPT	Understand acceleration
42	Equivalent Weight	Concept & formula	Problem solving	Apply equivalent weight
43	Tractive Effort	Maximum tractive effort	Numerical	Calculate tractive effort
44	Numerical Practice	Problems	Tutorial	Improve problem-solving
45	Final Review	Entire syllabus	Discussion	Achieve course outcomes


Signature of Faculty


Signature of H.O.D.

LESSON PLAN 2025-26

NAME OF THE TEACHER : SAMBIT KUMAR SAHOO, LECT. (STAGE-I, AUTOMOBILE)

Subject: Automotive Thermodynamics (AEPE202C / Th4(c))

Program: Diploma in Automobile Engineering

Semester: 4th

Total Contact Hours: 45

Total Marks: 100

Assessment: Progressive - 30, End Term -70

Credits: 3

COURSE OUTCOMES:

CO1: Analyze thermodynamic systems using the first and second laws, including concepts of entropy, availability, irreversibility, and reversible work.

CO2: Evaluate the performance of gas and vapor power cycles including Otto, Diesel, Dual Combustion, Brayton, Rankine, and their modifications for enhanced efficiency.

CO3: Understand the types, properties, and combustion characteristics of different fuels, and assess the efficiency and limitations of combustion processes in automotive applications.

CO4: Explain the principles and performance of refrigeration and air conditioning systems, and analyze their role in vehicle climate control.

CO5: Examine the principles and applications of gas dynamics in nozzles and analyze the working of various types of air compressors including reciprocating, centrifugal, and axial flow types.

CO6: Apply thermodynamic principles in designing and optimizing automotive systems, including compressors, propulsion systems, and alternative energy systems.

Class No.	Topic	Sub-Topics	Teaching Aids / Activities	Course Outcome
1	Introduction to Thermodynamics	System, surroundings, properties, state	PPT, Blackboard, Q&A	CO1
2	First Law of Thermodynamics	Energy, heat, work, applications	PPT, Numerical examples	CO1
3	First Law for Closed System	Cyclic & non-cyclic processes	Blackboard, Problems	CO1
4	Unsteady Flow Process	Filling & emptying of tanks	Diagram, PPT	CO1
5	Entropy	Concept, entropy change	PPT, Examples	CO1
6	Availability & Irreversibility	Reversible work, losses	Blackboard, Discussion	CO1
7	Unit-I Revision & Test	All Unit-I topics	Written test	CO1
8	Otto Cycle	Working, p-v & T-s diagrams	PPT, Charts	CO2
9	Diesel Cycle	Working, efficiency	Blackboard, Problems	CO2
10	Dual Combustion Cycle	Comparison with Otto & Diesel	PPT, Chart	CO2
11	Brayton Cycle	Gas turbine cycle	PPT, Diagram	CO2
12	Brayton Cycle Modifications	Regeneration, reheating	PPT, Case study	CO2
13	Jet Propulsion Cycle	Ideal jet cycle	Animation, PPT	CO2
14	Carnot Vapour Cycle	Limitations	Blackboard	CO2
15	Rankine Cycle	Working & efficiency	PPT, Diagram	CO2

16	Rankine Cycle Improvements	Superheating, reheating	PPT	CO2
17	Binary & Coupled Cycles	Cogeneration basics	PPT, Discussion	CO2
18	Unit-II Revision	All power cycles	Q&A, Test	CO2
19	Fuels – Introduction	Solid, liquid, gaseous fuels	Samples, PPT	CO3
20	Fuel Properties	CV, calorific value	Blackboard, Problems	CO3
21	Combustion Chemistry	Chemical equations	Blackboard	CO3
22	First Law in Combustion	Energy balance	PPT, Problems	CO3
23	Combustion Efficiency	Losses & limits	PPT, Discussion	CO3
24	Alternative Fuels	CNG, LPG, biofuels	PPT, Video	CO3
25	Unit-III Revision	Fuels & combustion	Test	CO3
26	Refrigeration Basics	Need & principles	PPT, Examples	CO4
27	Vapour Compression System	Components, cycle	Model, PPT	CO4
28	Vapour Absorption System	Working, comparison	PPT	CO4
29	COP & Refrigerants	Properties & uses	Blackboard	CO4
30	Psychrometry	Psychrometric chart	Chart, Problems	CO4
31	Air Conditioning Systems	Types & applications	PPT, Case study	CO4
32	Unit-IV Revision	RAC systems	Test	CO4
33	Gas Dynamics Basics	Flow parameters	PPT	CO5
34	Nozzles	Isentropic flow	Blackboard, Problems	CO5
35	Air Compressors – Intro	Uses of compressed air	PPT	CO5
36	Reciprocating Compressor	Single-stage cycle	Diagram, PPT	CO5
37	Volumetric Efficiency	Clearance effect	Blackboard	CO5
38	Multistage Compression	Intercooling	PPT, Problems	CO5
39	Optimum Intercooler Pressure	Calculations	Blackboard	CO5
40	Performance Calculations	Compressor numericals	Tutorial	CO5
41	Air Motors	Working & uses	PPT	CO5
42	Centrifugal Compressor	Construction & working	PPT, Video	CO5
43	Axial Flow Compressor	Working & applications	PPT	CO5
44	Blowers & Fans	Comparison & uses	Chart, Discussion	CO5
45	Unit-V Revision & Overall Test	Entire syllabus	Test, Viva	CO6

Subaloo
22/12/25

Signature of Faculty

Subaloo

Signature of H.O.D.

LESSON PLAN 2025-26

NAME OF THE TEACHER : LOKESH PATTNAIK, Sr. Lect.(Automobile)

Subject:Automotive Pollution Control (AEPE204A / Th5(a))

Program: Diploma in Automobile Engineering

Semester: 4th

Total Contact Hours: 45

Total Marks: 100

Assessment: Progressive - 30, End Term -70

Credits: 3

COURSE OUTCOMES:

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

CO1 Understand emission formation mechanism.

CO2 Interpret emission standards and fuel effect.

CO3 Apply emission testing method

CO4 Implement emission control technologies.

CO5: Analyze and control noise pollution.

CO6: Measure and control vibrations.

Class No.	Topic	Sub-Topics	Teaching Aids / Activities	Course Outcome
1	Introduction to Automotive Pollution	Types of pollution, need for control	PPT, Discussion	CO1
2	Emissions from SI Engines	CO, HC, NOx formation	PPT, Engine diagrams	CO1
3	Emissions from CI Engines	Smoke, particulates, NOx	PPT, Charts	CO1
4	Factors Affecting Emissions	A/F ratio, speed, load	Blackboard, Q&A	CO1
5	Effects of Pollution	Environmental & health effects	PPT, Video	CO1
6	Emission Norms	Euro norms overview	PPT, Table	CO2
7	Bharat Stage Norms	BS-I to BS-VI	PPT, Comparison chart	CO2
8	Fuel Properties & Additives	Effect on emissions	PPT, Discussion	CO2
9	Alternate Fuels	CNG, LPG, ethanol, biodiesel	PPT, Case study	CO2
10	Unit-I Revision	Complete Unit-I	Test, Viva	CO1, CO2
11	Emission Testing – Introduction	Purpose & importance	PPT	CO3
12	Emission Test Cycles	IDC, WLTC basics	PPT, Charts	CO3
13	CVS Method	Constant volume sampling	Diagram, PPT	CO3
14	NDIR Analyzer	Working & application	PPT, Instrument images	CO3
15	Flame Ionization Detector (FID)	HC measurement	PPT	CO3
16	Chemiluminescence Analyzer	NOx measurement	PPT	CO3
17	Smoke Meters	Opacity & Bosch smoke meter	PPT, Video	CO3

18	Gas Chromatograph	Principle & uses	PPT	C03
19	Unit-II Revision	Emission testing	Test	C03
20	Emission Control – Introduction	Need & methods	PPT	C04
21	A/F Ratio Control	Carburetion & EFI basics	PPT, Diagram	C04
22	Crankcase Emission Control	PCV system	PPT	C04
23	Fuel Evaporation Control	Evaporative loss & control	PPT	C04
24	EGR System	Working & advantages	PPT, Diagram	C04
25	Catalytic Converter	Two-way & three-way	PPT, Cut-section images	C04
26	SCR System	NOx reduction	PPT, Video	C04
27	Particulate Traps	DPF working	PPT	C04
28	LNT & DOC	Lean NOx trap, diesel oxidation catalyst	PPT	C04
29	Combustion Modification	Injection timing, pressure	Blackboard, Discussion	C04
30	Unit-III Revision	Emission control techniques	Test	C04
31	Introduction to Noise	Sound vs noise, dB scale	PPT	C05
32	Noise Measurement	Sound level meter	PPT, Demonstration	C05
33	Air-borne Noise Control	Absorbers & barriers	PPT	C05
34	Structure-borne Noise Control	Isolation & damping	PPT	C05
35	Engine Noise	Sources & control	PPT	C05
36	Brake & Tyre Noise	Causes & remedies	PPT, Discussion	C05
37	Gear & Clutch Noise	Noise sources	PPT	C05
38	Silencers	Reactive & absorptive	PPT, Diagrams	C05
39	Anechoic Chamber	Purpose & working	PPT, Video	C05
40	Unit-IV Revision	Noise & control	Test	C05
41	Introduction to Vibration	Basics & terminology	PPT	C06
42	Types & Sources of Vibration	Engine & drivetrain	PPT	C06
43	Vibration Measurement	FFT analyzer	PPT, Instrument images	C06
44	Vibration Control Methods	Passive, active, semi-active	PPT	C06
45	Quarter Car Model & Revision	Model analysis, overall revision	Blackboard, Test	C06


Signature of Faculty


Signature of H.O.D.