LESSON PLAN 2025-26

NAME OF THE TEACHER : LOKESH PATTNAIK, Sr. Lect.(Automobile)
Subject:Industrial Engineering & Management (Th1)
Program: Diploma in Automobile Engineering
Semester: 6th
Total Contact Hours: 60
Total Marks: 100
Assessment: Internal Assesment - 20, End Semester -80

COURSE OBJECTIVES:
After undergoing this course, the students will be able to:
1. Identify the place for a new plant set up and systematic arrangement of machinery and shop for smooth production.
2. Take right decisions to optimize resources utilizations by improving productivity of the lands, buildings, people, material, machines, money, methods and management effectively.
3. Understanding of stock management and maintenance to reduce plant ideal time.
4. To use the charts to record the quality of products.
5. To eliminate unproductive activities under the control of the management, supervisor, worker and the design of products and processes.

Class No.	Topic	Subtopic	Teaching Aids / Activities	Course Objective
1	Plant Engineering	Introduction, selection of site	Chalk & board, PPT	CO1
2	Plant Engineering	Factors affecting site selection	PPT, discussion	CO1
3	Plant Layout	Definition & objectives	Charts, PPT	CO1
4	Plant Layout	Principles of plant layout	Layout diagrams	CO1
5	Plant Layout	Process layout	Diagrams, examples	CO1
6	Plant Layout	Product layout	PPT, case study	CO1
7	Plant Layout	Combination layout & improvement techniques	Flow charts	CO1
8	Material Handling	Principles & equipment	Videos, charts	CO1
9	Plant Maintenance	Importance of maintenance	PPT	CO1
10	Plant Maintenance	Breakdown, preventive & scheduled maintenance	Case study	CO1
11	Operations Research	Introduction & applications	PPT, examples	CO2
12	Operations Research	Advantages & limitations	Discussion	CO2
13	LPP	Definition & formulation	Chalk & board	CO2
14	LPP	Graphical method – basics	Numerical problems	CO2
15	LPP	Graphical solution (maximization)	Problem solving	CO2
16	LPP	Graphical solution (minimization)	Practice problems	CO2
17	CPM	Introduction & terminology	Network diagrams	CO2
18	CPM	Numerical problems	Problem solving	CO2
19	PERT	Introduction & simple problems	Charts	CO2

20	CPM vs PERT	Comparison & applications	Discussion	CO2
21	Inventory Control	Introduction & classification	PPT	CO3
22	Inventory Control	Objectives & functions	Discussion	CO3
23	Inventory Control	Benefits of inventory control	Case study	CO3
24	Inventory Control	Inventory costs	Chalk & board	CO3
25	Inventory Control	Inventory terminology	Examples	CO3
26	EOQ	EOQ model – derivation	Mathematical steps	CO3
27	EOQ	EOQ numerical problems	Problem solving	CO3
28	EOQ	EOQ applications	Practice problems	CO3
29	ABC Analysis	Concept & classification	Charts	CO3
30	ABC Analysis	Industrial application	Case study	CO3
31	Quality Control	Inspection & QC – definition	PPT	CO4
32	Quality Control	Planning of inspection	Flow charts	CO4
33	Quality Control	Types of inspection	Charts	CO4
34	Quality Control	Advantages & disadvantages	Discussion	CO4
35	Quality Control	Factors affecting quality	Case study	CO4
36	SQC	Introduction to SQC	PPT	CO4
37	Control Charts	Variables & attributes	Charts	CO4
38	Control Charts	$\bar{X}$ & R charts	Numerical problems	CO4
39	Control Charts	P chart	Problem solving	CO4
40	Control Charts	C chart	Examples	CO4
41	ISO	ISO 9001 concept	PPT	CO4
42	ISO	Quality Management System	Discussion	CO4
43	ISO	Certification procedure	Case study	CO4
44	ISO	Benefits of ISO	PPT	CO4
45	Modern Quality Tools	JIT, Six Sigma, 7S, Lean manufacturing	Videos	CO4
46	PPC	Introduction to PPC	PPT	CO5
47	PPC	Functions of PPC	Discussion	CO5
48	Forecasting	Methods of forecasting	Charts	CO5
49	Routing	Concept & procedure	Flow charts	CO5
50	Routing	Examples	Case study	CO5
51	Scheduling	Principles of scheduling	PPT	CO5
52	Scheduling	Gantt charts	Charts	CO5
53	Dispatching	Meaning & functions	Discussion	CO5
54	Dispatching	Procedures	Examples	CO5
55	Controlling	Production control techniques	PPT	CO5
56	Production Types	Mass production	Charts	CO5
57	Production Types	Batch production	Examples	CO5
58	Production Types	Job order production	Case study	CO5
59	Planning	Product planning principles	Discussion	CO5
60	Planning	Process planning principles	PPT	CO5

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LESSON PLAN 2025-26

NAME OF THE TEACHER : KUMAR GYANADEEP (STAGE-II, AUTOMOBILE)
Subject:Automotive System & Heavy Equipments (Th2)
Program: Diploma in Automobile Engineering
Semester: 6th
Total Contact Hours: 60
Total Marks: 100
Assessment: Internal Assesment - 20, End Semester -80

COURSE OBJECTIVES:
On completion of the subject a student will be able to understand and explain.
1. Able to know about the function & assembly
2. Able to know about the Steering mechanism & steering geometry
3. Able to know about the suspension system
4. Able to know about working Principle, types & Functioning of brake
5. Able to know about the function of wheels ,Tyres & designation ,dimensions
6. Able to know about the chassis of vehicle and various heavy equipments

Class No.	Topic	Subtopic	Teaching Aids / Activities	Course Objective
1	Front Axle	Introduction to front axle, functions	Blackboard, PPT, diagrams	CO1
2	Front Axle	Construction of front axle	Charts, cut section model	CO1
3	Front Axle	Types of front axle & stub axle	Models, video	CO1
4	Front Axle	Front wheel assembly	Wheel hub model, discussion	CO1
5	Front Axle	Numerical & revision	Question–answer	CO1
6	Steering System	Introduction & function of steering	PPT, steering layout	CO2
7	Steering System	Principle of correct steering	Diagrams, animation	CO2
8	Steering System	Components of steering system	Steering gear models	CO2
9	Steering Gear	Types of steering gear	Charts, videos	CO2
10	Steering Geometry	Introduction to steering geometry	Blackboard, PPT	CO2
11	Steering Geometry	Camber, caster, king pin inclination	Diagrams, wheel alignment chart	CO2
12	Steering Geometry	Toe-in, toe-out & combined angle	Practical demo	CO2
13	Steering Geometry	Understeer & oversteer	Videos, discussion	CO2
14	Steering Geometry	Wheel alignment & effects of misalignment	Alignment machine demo	CO2
15	Steering Geometry	Turning radius & revision	Numerical problems	CO2
16	Suspension System	Introduction & function	PPT, vehicle model	CO3
17	Suspension System	Requirements of suspension	Blackboard	CO3
18	Suspension Springs	Leaf spring – construction & working	Leaf spring model	CO3
19	Suspension Springs	Coil spring, torsion bar	Charts, videos	CO3
20	Suspension Springs	Rubber torsion unit	PPT	CO3
21	Suspension System	Independent suspension system	Vehicle layout diagram	CO3

22	Suspension System	Rigid axle suspension	Charts	CO3
23	Suspension System	Advantages & disadvantages	Discussion	CO3
24	Suspension System	Shock absorber	Cut section model	CO3
25	Suspension System	Stabilizer bar	PPT	CO3
26	Suspension System	Comparison & revision	Question–answer	CO3
27	Brake System	Introduction & principles	PPT, diagrams	CO4
28	Brake System	Requirements of braking	Blackboard	CO4
29	Drum Brake	Construction & working	Drum brake model	CO4
30	Drum Brake	Leading & trailing shoe	Animation	CO4
31	Disc Brake	Construction & working	Disc brake model	CO4
32	Brake System	Brake fade	PPT, discussion	CO4
33	Hydraulic Brake	Principle & components	Hydraulic brake model	CO4
34	Hydraulic Brake	Master cylinder	Cut section	CO4
35	Hydraulic Brake	Tandem master cylinder	PPT	CO4
36	Hydraulic Brake	Wheel cylinder	Diagram	CO4
37	Brake Fluid	Types & grades	Samples, chart	CO4
38	Hydraulic Brake	Advantages & disadvantages	Discussion	CO4
39	Power Brake	Types of power brakes	PPT	CO4
40	Air Brake	Construction & working	Air brake layout	CO4
41	Hand Brake	Construction & working	Vehicle demo	CO4
42	Brake Maintenance	Adjustment of brakes	Practical demo	CO4
43	Brake Maintenance	Bleeding of brakes	Workshop demo	CO4
44	Brake System	Common brake problems	Case study	CO4
45	Brake System	ABS – working principle	Animation	CO4
46	Brake System	Revision & numericals	Q&A	CO4
47	Wheels & Tyres	Introduction & tyre construction	Tyre cut model	CO5
48	Wheels & Tyres	Tyre dimensions	Blackboard	CO5
49	Wheels & Tyres	Tyre classification	Charts	CO5
50	Wheels & Tyres	Radial vs cross ply	PPT	CO5
51	Wheels & Tyres	Tyre size designation	Tyre samples	CO5
52	Wheels & Tyres	Tyre damages	Pictures	CO5
53	Wheels	Types of wheels	Wheel models	CO5
54	Wheels	Wheel dimensions & designation	Blackboard	CO5
55	Chassis	Introduction & layout	Chassis diagram	CO6
56	Chassis	Types of chassis & frames	PPT	CO6
57	Tractor	Construction & classification	Videos	CO6
58	Heavy Equipment	Dump truck, grader	PPT	CO6
59	Heavy Equipment	Road roller, dozer, loader	Charts	CO6
60	Heavy Equipment	Crane, scraper & revision	Discussion	CO6

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LESSON PLAN 2025-26

NAME OF THE TEACHER : KUMAR GYANADEEP (STAGE-II, AUTOMOBILE)
Subject:Vehicle Maintenance & Motor Vehicle Act (Th3)
Program: Diploma in Automobile Engineering
Semester: 6th
Total Contact Hours: 60
Total Marks: 100
Assessment: Internal Assesment - 20, End Semester -80

COURSE OBJECTIVES:
On completion of subject, students will be able to
1. Compare and understand types of maintenance systems.
2. Knowledge about various types of service station and layout of workshop.
3. Understand use of tools and equipments.
4. Execute services, repairs and overhauling processes of different systems of vehicle.
5. Knowledge about different motor vehicle acts.

Class No.	Topic	Subtopic	Teaching Aids / Activities	Course Objective
1	Vehicle Maintenance	Introduction to vehicle maintenance	PPT, Blackboard	CO1
2	Vehicle Maintenance	Need of vehicle maintenance	Discussion, examples	CO1
3	Maintenance Systems	Types of maintenance systems	PPT, chart	CO1
4	Maintenance Systems	Breakdown maintenance	Case study	CO1
5	Maintenance Systems	Preventive maintenance	Maintenance schedule	CO1
6	Maintenance Systems	Predictive maintenance	Video, discussion	CO1
7	Maintenance Systems	Total productive maintenance (TPM)	PPT	CO1
8	Vehicle Maintenance	Revision & numerical / Q&A	Question–answer	CO1
9	Service Station	Introduction & types of service station	PPT	CO2
10	Service Station	Private service station	Discussion	CO2
11	Service Station	Authorized service station	Charts	CO2
12	Service Station	Criteria for service station	Blackboard	CO2
13	Workshop Layout	Introduction to workshop layout	Layout diagrams	CO2
14	Workshop Layout	Elements of workshop layout	Charts	CO2
15	Workshop Records	Workshop documents & records	Sample formats	CO2
16	Job Card	Job card & its importance	Job card sample	CO2
17	Service Station	Revision	Q&A	CO2
18	Tools & Equipments	Introduction & classification	PPT	CO3
19	Hand Tools	Spanners & types	Tool kit demo	CO3
20	Hand Tools	Screwdrivers & screws	Demonstration	CO3
21	Hand Tools	Torque wrench, pliers, Allen keys	Tools demo	CO3
22	Hand Tools	Hammers, chisels, files	Workshop demo	CO3
23	Hand Tools	Hacksaw, wire brush, scraper	Practical demo	CO3

24	Cutting Tools	Taps, dies, drill bits, reamers	Tool samples	CO3
25	Measuring Tools	Measuring instruments	Demonstration	CO3
26	Special Tools	Valve spring & piston ring compressor	Tool demo	CO3
27	Special Tools	Oil filter wrench, puller, C-clamp	Workshop demo	CO3
28	Tyre Tools	Tyre levers, tool box	Practical demo	CO3
29	Pneumatic Tools	Pneumatic tools	PPT, video	CO3
30	Garage Equipments	Drilling machine & grinder	Machine demo	CO3
31	Lifting Equipments	Mechanical & hydraulic jack	Practical demo	CO3
32	Garage Equipments	Lubrication equipments	Demo	CO3
33	Garage Equipments	Tyre changer & wheel balancer	Video	CO3
34	Garage Equipments	Wheel aligner & brake bleeding unit	PPT	CO3
35	Garage Equipments	Air compressor & car wash machine	Demo	CO3
36	Testing Equipments	Engine analyser	PPT	CO3
37	Testing Equipments	Hydraulic press	Demo	CO3
38	Testing Equipments	Spark plug tester & injector tester	Video	CO3
39	Testing Equipments	Battery charging & testing machine	Demo	CO3
40	Tools & Equipments	Revision	Q&A	CO3
41	Service & Repair	Engine troubles – causes & remedies	Charts	CO4
42	Service & Repair	Fuel system troubles	Discussion	CO4
43	Service & Repair	Cooling system troubles	PPT	CO4
44	Service & Repair	Lubrication system troubles	Blackboard	CO4
45	Service & Repair	MPFI engine troubles	Video	CO4
46	Overhauling	Engine servicing & overhauling	PPT	CO4
47	Overhauling	Chassis servicing	Diagrams	CO4
48	Overhauling	Body repair & maintenance	Discussion	CO4
49	Service & Repair	Revision	Q&A	CO4
50	Motor Vehicle Act	Introduction to M.V. Act	PPT	CO5
51	M.V. Act Sections	Sections 3, 4, 5	Blackboard	CO5
52	M.V. Act Sections	Sections 19, 39	PPT	CO5
53	M.V. Act Sections	Sections 49, 50, 51	Discussion	CO5
54	M.V. Act Sections	Sections 128, 129, 130, 133	PPT	CO5
55	Driving License	Necessity & types	Charts	CO5
56	Driving License	Grant of permanent DL	Blackboard	CO5
57	Driving License	Documents required for DL	Sample forms	CO5
58	Vehicle Registration	Necessity & procedure	PPT	CO5
59	Registration	Temporary & permanent registration	Discussion	CO5
60	Registration	Renewal & revision	Q&A	CO5

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LESSON PLAN 2025-26

NAME OF THE TEACHER : SAMBIT KUMAR SAHOO, LECT. (STAGE-I, AUTOMOBILE)
Subject:Electric & Hybrid Vehicle AND Emission Control (Th4)
Program: Diploma in Automobile Engineering
Semester: 6th
Total Contact Hours: 60
Total Marks: 100
Assessment: Internal Assesment - 20, End Semester -80

COURSE OBJECTIVES:
At the end of the course the students will be able to:
1. Have brief idea on vehicle development
2. Understand the basic operation of battery electric vehicles.
3. Understand the basic operation of fuel cell electric vehicles.
4. Understand the concepts of hybrid electric vehicles.
5. Have knowledge on modern vehicle emission control technologies.

Class No.	Topic	Subtopic	Teaching Aids / Activities	Course Objective
1	Electric Vehicle	Introduction to Electric Vehicles	PPT, Blackboard	CO1
2	Electric Vehicle	Need for Electric Vehicles	PPT, Discussion	CO1
3	Electric Vehicle	Problems of Electric Vehicles	Charts, Q&A	CO1
4	Electric Vehicle	Advantages of Electric Vehicles	PPT	CO1
5	Electric Vehicle	Disadvantages of Electric Vehicles	Blackboard	CO1
6	Electric Vehicle	Major Components of EV	Block Diagram, PPT	CO2
7	Classification of EVs	Types of Electric Vehicles	PPT	CO2
8	BEV	BEV – Advantages & Applications	PPT	CO2
9	BEV	BEV – Disadvantages	Discussion	CO2
10	HEV	HEV – Advantages & Applications	PPT	CO4
11	HEV	HEV – Disadvantages	Blackboard	CO4
12	PHEV	Plug-in Hybrid Electric Vehicle	PPT	CO4
13	Energy Sources	Battery, UC, Flywheel, Fuel Cell	PPT	CO2
14	Energy Sources	Requirements of EV Energy Source	Blackboard	CO2
15	Batteries	EV Battery Requirements	PPT	CO2
16	Batteries	Battery Selection Criteria	Discussion	CO2
17	Batteries	Lead Acid Battery	Charts	CO2
18	Batteries	Lithium-ion Battery	PPT	CO2
19	Batteries	Battery Comparison	Table, Q&A	CO2
20	Batteries	Deep Cycle Battery	PPT	CO2
21	Electric Motor	Introduction & Working	PPT	CO2
22	EV Motor	Requirements of EV Motor	Blackboard	CO2

23	DC Motor	Brushed DC Motor	Diagram	CO2
24	DC Motor	Brushless DC Motor	PPT	CO2
25	SRM	Switched Reluctance Motor	PPT	CO2
26	AC Motor	AC Induction Motor	PPT	CO2
27	Motors	Comparison of EV Motors	Table	CO2
28	Indian EVs	2-Wheeler Electric Vehicles	PPT	CO2
29	Indian EVs	3-Wheeler Electric Vehicles	PPT	CO2
30	Indian EVs	4-Wheeler Electric Vehicles	PPT	CO2
31	Revision	Unit-3 Revision	Discussion	CO2
32	Assessment	Unit-3 Test	Written Test	CO2
33	Hybrid Vehicle	Introduction to Hybrid Vehicles	PPT	CO4
34	HEV	Advantages & Disadvantages	Discussion	CO4
35	HEV	Components of Hybrid Vehicle	Diagram	CO4
36	HEV	Working Principle	PPT	CO4
37	Hybridization	Micro Hybrid	PPT	CO4
38	Hybridization	Mild Hybrid	PPT	CO4
39	Hybridization	Full Hybrid	PPT	CO4
40	Hybridization	Comparison of Hybrid Types	Table	CO4
41	FCEV	Introduction to FCEV	PPT	CO3
42	FCEV	Working Principle of FCEV	Diagram	CO3
43	FCEV	Advantages of FCEV	Discussion	CO3
44	FCEV	Disadvantages of FCEV	Blackboard	CO3
45	Revision	Unit-4 Revision	Q&A	CO4
46	Emission Control	Introduction to Emission Control	PPT	CO5
47	Engine Design	Advanced Engine Design	PPT	CO5
48	VVT	Variable Valve Timing	Video	CO5
49	Turbocharging	Turbo Charging System	PPT	CO5
50	Catalytic Converter	Introduction	Diagram	CO5
51	Catalyst	Two-Way Catalyst	PPT	CO5
52	Catalyst	Three-Way Catalyst	PPT	CO5
53	DOC	Diesel Oxidation Catalyst	PPT	CO5
54	SCR	Selective Catalytic Reduction	PPT	CO5
55	NOx Control	NOx Adsorber Catalyst	PPT	CO5
56	DPF	Diesel Particulate Filter	Diagram	CO5
57	EGR	Exhaust Gas Recirculation	PPT	CO5
58	Crankcase	Crankcase Emission Control	Blackboard	CO5
59	Revision	Unit-5 Revision	Discussion	CO5
60	Assessment	End Semester Revision/Test	Written Test	CO5

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