GOVERNMENT POLYTECHNIC TALWAR

Department of Automotive Engineering | 5th Semester Lesson Plans

Subject: EDMOV

Teacher: Gaurav Puwari | Class: 5th Semester Automobile Engg.

Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
August	Week 1 Week 2 Week 3	1,3,4,5,6 10,11,12,13 17,18,19,20,22	Unit-I: Introduction	Design considerations, design procedure, Basic requirements, classifications of design and principles of good economic design Standardization, interchangeability of Automobile parts with reference to ISspecifications.	
Aug/Sept	Week 4 Week 1	24,25,26,27,29, 31 1,2,3,5		Limits, fits and tolerances. Concept of Sunk Keys, Rectangular Keys, Square, Parallel, Crosshead.	
September	Week 2 Week 3	14,15,16,19 21,22,23,24,26	Unit-II: Design of keys, couplings and Engine Parts	Woodruff Key Design of rectangular key, Coupling: Flange coupling, Muff coupling, Clamp coupling, Engine Parts: Cylinder liner and cylinder head, Piston, Connecting Rod, Clutch- Single Plate and Multi plate Clutch, Brakes- Internal Expanding shoe brake.	
Sept/Oct	Week 4 Week 1 Week 2 Week 3	28,29,30 1,3 5,6,7,8 12,13,14,15,17	Unit-III: Simple Mechanism	Definition of link, kinematic pair, kinematic chain, Mechanism, inversions and machines. Simple examples of mechanism with: Lower pairs, Four bar chain, Slider crank chain. Double slider crank chain, Higher pairs. Displacement, velocity and acceleration of piston. Angular velocity and acceleration of connecting rod.	
October	Week 4 Week 5	19,21,22,24 27,28,29,31	Unit-IV: Motion and Turning Moment	Calculations of piston effort and crank effort at different angles, Fly wheel: types, weight and moment of inertia. Fluctuation of energy for fly wheel, Turning moment diagrams with reference to internal combustion engines.	
November	Week 1 Week 2 Week 3 Week 4	 9,10,11,12 16,17,18,19,21 23,24,26,28	Unit-V: Power Transmission	**House Test (Week 1)** Flat belt, V-belt and chain drives. Horse power transmitted and condition for max power transmitted. Ratio of tension of two sides of the belt with and without centrifugal tension. Velocity ratios transmitted by Belts, Simple, compound and Epicyclic gear box.	

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GOVERNMENT POLYTECHNIC TALWAR

Department of Automotive Engineering | 5th Semester Lesson Plans

Subject: AEEE

Teacher: Rishu Dhiman | **Class:** 5th Semester Automobile Engg.

Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
August	Week 1 to 4	5,6 10,11,12,13 17,18,19,20 24,25,26,27	Unit-I: Introduction & Batteries	Various Electrical components/systems in Automobile. earths return system, earthing types, 6V, 12V & 24V system. Batteries: Construction, working, elements, types, rating, capacity. Battery Testing: hydrometer, voltage test. Battery Charging: Constant potential/current. Defects: Sulphation, decay, short circuits.	
September	Week 1 to 3	1,2,3 7,8,9,10 14,15,16,17	Unit-II: Charging System & Starting system	Circuits, alternator components, types, construction, working. Starter motor principle, switches, starter to engine drive types, Starter alternators.	Class Test 1 (Week 2)
Sept/Oct	Week 4 Week 1 Week 2	21,22,23,24,28, 29,30 1 5,6,7,8	Unit-III: Ignition System	Coil, distributor, condenser, cam angle, ignition timing, advancing mechanisms (centrifugal/vacuum), transistorized ignition, magneto ignition. Spark plugs: classification, care and maintenance.	Class Test 2 (Week 2)
October	Week 3 to 5	12,13,14,15 19,21,22 27,28,29	Unit-IV: Lighting System	Lighting circuits, head lamp, sealed beam, brake light, indicator lights. HT and LT cables, colour codes, wiring harness diagrams. Fuses, faults. Fuel/Air/Temp gauges, wipers, horns, electric fuel pump.	
November	Week 1 to 4	9,10,11,12 16,17,18,19 23,25,26	Unit-V: Electrical Accessories	**House Test (Week 1)** Impulse Speedometer, tachometer, heaters, defrosters. Electric door locks, window actuation. Sensors in engine management: Air flow, manifold pressure, speed, throttle position, oxygen, temperature.	PT Meeting (Week 2)

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GOVERNMENT POLYTECHNIC TALWAR

Department of Automotive Engineering | 5th Semester Lesson Plans

Subject: Two and Three Wheeler

Teacher: Rishu Dhiman | **Class:** 5th Semester Automobile Engg.

Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
August	Week 1 Week 2	7 11,14	Unit-I: Power Unit	Two stroke and four stroke SI engine, merits and demerits. Symmetrical and unsymmetrical port timing diagrams. Types of scavenging process, efficiency. Rotary valve engine.	
August	Week 3 Week 4	18,21,22 25,28,29	Unit-II: Various System	Fuel system. Lubrication system. Magneto coil and battery Electronic Ignition system. Starting system. Kick starter system.	
September	Week 1 to 4	1,5 8,11 15,18,19 22,25,26,29	Unit-III: Chassis and Sub-Systems	Mainframe, types. Chassis and shaft drive. Single, multiple plates and centrifugal clutches. Gear box and controls. Front and rear suspension- systems. Shock absorbers. Panel meters and controls.	Class Test 1 (Week 2)
October	Week 1 to 5	3 6,9 13,16,17 23,24 27,30,31	Unit-IV: Brake and Wheels	Drum brakes, Disc brakes, front and rear brake links layouts. Spoked wheel, Cast wheel. Disc types. Tyres & tubes. Case study of Major Indian models: Bajaj, Vespa, Lambretta scooters. Enfield, TVSSuzuki, Hero-Honda, Yamaha RX100.	Class Test 2 (Week 2)
November	Week 1 to 4	10,13 17,20,21 27,28	Unit-V: Two Wheelers	**House Test (Week 1)** Kawasaki Bajaj Motor cycle. Kinetic Spark, Hero Majestic, TVS mopeds. Servicing and maintenance. Three Wheelers: Case study of Indian Models. Front engine and rear engine. Auto rickshaws. Pickup van, Delivery Van and Trailer.	PT Meeting (Week 2)

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GOVERNMENT POLYTECHNIC TALWAR

Department of Automotive Engineering | 5th Semester Lesson Plans

Subject: Mechatronics & Microprocessors

Teacher: Jitender Kumar | Class: 5th Semester Automobile Engg.

Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
August	Week 1 to 4	7 11,14 18,21,22 25,28,29	Unit-I: Introduction	Introduction to Mechatronics, Measurement systems, Control system- open Loop, Close loop and sequential, Microprocessor based controllers. Sensors and transducers, Displacement, position and motion sensors, Force sensors, Liquid flow sensors.	
September	Week 1 Week 2	1,5 8,11	Unit-II: Sensors and Transducers	Temperature sensors, Light sensors, Selection of sensors, Simple problems.	Class Test 1 (Week 2)
Sept/Oct	Week 3 Week 4 Week 1 Week 2	15,18,19 22,25,26,29 3 6,9	Unit-III: Data Presentation Systems	Displays, Data presentation elements, Magnetic recording, Data acquisition systems. Measurement systems, Testing and calibration, Simple problems. Actuation systems, Pneumatic and hydraulic systems, Directional/Pressure control valves, Cylinders, Rotary actuators.	Class Test 2 (Week 2)
October	Week 3 to 5	13,16,17 23,24 27,30,31	Unit-IV: Mechanical Actuation Systems	Mechanical systems, Cams, Gear trains, Ratchet and pawl, Belt and chain drive. Electrical systems, Mechanical switches, Solenoids, D.C. motors, A.C. motors, Stepper motors.	
November	Week 1 to 4	10,13 17,20,21 27,28	Unit-V: Microprocessors & PLC	**House Test (Week 1)** Microcomputer structure, Microcontrollers Applications, Programmable logic control. applications, Basic structure, input/ output processing.	PT Meeting (Week 2)

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Subject: Auto Electrical and Electronics

GOVERNMENT POLYTECHNIC TALWAR

Department of Automotive Engineering | 5th Semester Lesson Plans

Teacher: Vikram Chand | Class: 5th sem/Automobile Engg. (Group 1)

Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
		12	Job 1	Testing of Battery with hydrometer and high rate discharge tester, charging of Batteries.	
August		19	Job 2	Testing and measurement of ignition timing and dwell angle with timing light and cam angle tester.	
		26	Job 3	Testing, cleaning and setting of spark plug on spark plug cleaning and testing machine.	
		2	Job 4	Testing of alternator rotor and stator winding for short circuit, ground and broken circuit using alternator test bench.	
		9	Job 5	Testing and setting of horn and relay.	
September		16	Job 6	Testing and fault tracing of field winding, armature and magnetic switch for short circuit, grounding of a starter using starter test bench.	
		23	Job 7	Identification of colour codes for continuity test in a wiring harness.	
		30	Job 8	Study and sketching of complete wiring circuit of an Indian vehicle.	
October		7	Job 9	Fault tracing and diagnosis of electronic ignition system through engine car scanner.	
		14	Job 10	Study and demonstration of MPFI and CRDI system.	
		21,28	Job 11	Layout of temperature sensor circuit.	
November		11,18	Job 12	Study and layout circuit of D.C. Shunt motor and stepper motor	
		25	Job 13	PLC basic circuits and control	

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Subject: Auto Electrical and Electronics

GOVERNMENT POLYTECHNIC TALWAR

Department of Automotive Engineering | 5th Semester Lesson Plans

Teacher: Vikram Chand | **Class: 5th sem/Automobile Engg. (Group II)**

Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
		10	Job 1	Testing of Battery with hydrometer and high rate discharge tester.	
August		17	Job 2	Testing and measurement of ignition timing and dwell angle with timing	
		24	Job 3	Testing, cleaning and setting of spark plug on spark plug cleaning and	
		7	Job 4	Testing of alternator rotor and stator winding for short circuit, ground	
		14	Job 5	Testing and setting of horn and relay.	
September		21	Job 6	Testing and fault tracing of field winding, armature and magnetic switch	
		28	Job 7	Identification of colour codes for continuity test in a wiring harness.	
		5	Job 8	Study and sketching of complete wiring circuit of an Indian vehicle.	
October		12	Job 9	Fault tracing and diagnosis of electronic ignition system through engine	
		19	Job 10	Study and demonstration of MPFI and CRDI system.	
		9	Job 11	Layout of temperature sensor circuit.	
November		16	Job 12	Study and layout circuit of D.C. Shunt motor and stepper motor	
		23	Job 13	PLC basic circuits and control	

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Subject: Driving Practice II

GOVERNMENT POLYTECHNIC TALWAR

Department of Automotive Engineering | 5th Semester Lesson Plans

Teacher: Jitender Kumar | Class: 5th sem/Automobile Engg. (Group -1)

Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
		10,17	Job 1	Driving Techniques	
		22,24	Job 2	Revision	
August		29	Job 3	Maneuver in: Passing, Merging, Diverging, Overtaking, Crossing, Turning,	
		31	Job 4	Use of bye pass, sub way, over bridge and fly over	
		5,7	Job 5	Difficult driving- Night driving, Hill driving, Driving under special	
September		14,19	Job 6	Driving on highways: lane selection & lane discipline	
		21,26	Job 7	Public relations and dealing with police	
		28	Job 8	Fire Hazards	
		3,5	Job 9	First Aid	
October		12,17	Job 10	Vehicle Repair & Maintenance: Break down recovery	
		19,24,31	Job 11	Recovery from police: accident cases	
		9,16	Job 12	Record keeping	
November		21,23	Job 13	Accounting	
		28	Job 14	Practice on road up to 60 K.M. during the semester for each student.	

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Subject: Driving Practice II

GOVERNMENT POLYTECHNIC TALWAR

Department of Automotive Engineering | 5th Semester Lesson Plans

Teacher: Rishu Dhiman | Class: 5th sem/Automobile Engg. (Group II)

Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
		13	Job 1	Driving Techniques	
		20,22	Job 2	Revision	
August		27	Job 3	Maneuver In: Passing, Merging, Diverging, Overtaking, Crossing, Turning,	
		29	Job 4	Use of bye pass, sub way, over bridge and fly over	
		3,5	Job 5	Difficult driving- Night driving, Hill driving, Driving under special	
September		10,17	Job 6	Driving on highways: lane selection & lane discipline	
		19,24	Job 7	Public relations and dealing with police	
		26	Job 8	Fire Hazards	
		1,3,8	Job 9	First Aid	
October		15,17,22	Job 10	Vehicle Repair & Maintenance: Break down recovery	
		24,29,31	Job 11	Recovery from police: accident cases	
		12,19	Job 12	Record keeping	
November		21,26	Job 13	Accounting	
		28	Job 14	Practice on road up to 60 K.M. during the semester for each student.	

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Subject: Auto Workshop Practice -III

GOVERNMENT POLYTECHNIC TALWAR

Department of Automotive Engineering | 5th Semester Lesson Plans

Teacher: Jitender Kumar | Class: 5th sem/Automobile Engg. (Group-1)

Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
		7,13	Job 1	Study of safety equipment's for electrical vehicles.	
August		14,20	Job 2	Study of electric vehicle components (Drive chain, PDU, On board charger, BCM) and fault findings	
		21,27	Job 3	Study of Electric Vehicle battery system, rating and drive train system in Electric Vehicle.	
		28	Job 4	Job on making the electric vehicle voltage free on two wheeler and electric vehicle.	
September		3,10	Job 5	Job on measurement and diagnosis on electric drive motor in electric vehicle on trainer.	
		11,17	Job 6	Job on Removal of windows, replacement of window glass, fender and window motor mechanism.	
		18,24,25	Job 7	Diagnosis and installation of center locking connected car system and standard accessories.	
		1,8	Job 8	Job on removal of complete dashboard and installation	
		9,15	Job 9	Decarburizing of Engines: removing carbon deposits from engine combustion chamber, piston crown, and valve parts manually and by using engine de-	
		16	Job 10	Overhauling of Diesel engine.	
October		22	Job 11	Surfacing of cylinder heads, cylinder blocks and manifolds with cylinder head re-facing machine.	
		23	Job 12	Practice in cylinder boring machine, measuring ovality and taperness of cylinder bore, using cylinder dial gauge, inside micrometer, telescopic gauge, and use of direct reading micrometer.	
		29	Job 13	Practice in honing cylinder blocks, keeping allowance of cylinder clearances.	
		30	Job 14	Inspection and practice of crankshaft, crankpin, journal grinding, main journal grinding on crankshaft grinding machine.	
		12	Job 15	Practice of cam shaft journals on line boring machine.	
		13	Job 16	Servicing of valve and valve mechanism, replacement of valves.	
November		19	Job 17	Testing of fuel injector in fuel injection tester.	
		20	Job 18	Calibrations of fuel injection pump on fuel calibration machine.	
		26	Job 19	Practice on brake drum lathe, measuring ovality, skimming the brake drum.	
		27	Job 20	Practice in nozzle grinding and lapping, setting of injection pressure and nature of spray.	

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Subject: Auto Workshop Practice -III

GOVERNMENT POLYTECHNIC TALWAR

Department of Automotive Engineering | 5th Semester Lesson Plans

Teacher: Jitender Kumar | Class: 5th sem/Automobile Engg. (Group -II)

Month	Week	Date	Name of Chapter	Contents to be taught	Remarks
		12,14	Job 1	Study of safety equipment's for electrical vehicles.	
August		19,21	Job 2	Study of electric vehicle components (Drive chain, PDU, On board charger, BCM) and fault findings	
		26,28	Job 3	Study of Electric Vehicle battery system, rating and drive train system in Electric Vehicle.	
		2	Job 4	Job on making the electric vehicle voltage free on two wheeler and electric vehicle.	
		9	Job 5	Job on measurement and diagnosis on electric drive motor in electric vehicle on trainer.	
September		11,16	Job 6	Job on Removal of windows, replacement of window glass, fender and window motor mechanism.	
		18	Job 7	Diagnosis and installation of center locking connected car system and standard laccessories.	
		23,25	Job 8	Job on removal of complete dashboard and installation	
		7,9	Job 9	Decarburizing of Engines: removing carbon deposits from engine combustion chamber, piston crown, and valve parts manually and by using engine de-	
		14	Job 10	Overhauling of Diesel engine.	
October		16	Job 11	Surfacing of cylinder heads, cylinder blocks and manifolds with cylinder head re-facing machine.	
		21	Job 12	Practice in cylinder boring machine, measuring ovality and taperness of cylinder bore, using cylinder dial gauge, inside micrometer, telescopic gauge, and use of direct reading micrometer.	
		23	Job 13	Practice in honing cylinder blocks, keeping allowance of cylinder clearances.	
		28	Job 14	Inspection and practice of crankshaft, crankpin, journal grinding, main journal grinding on crankshaft grinding machine.	
		30	Job 15	Practice of cam shaft journals on line boring machine.	
November		11,13	Job 16	Servicing of valve and valve mechanism, replacement of valves.	
		18	Job 17	Testing of fuel injector in fuel injection tester.	
		20	Job 18	Calibrations of fuel injection pump on fuel calibration machine.	
		25	Job 19	Practice on brake drum lathe, measuring ovality, skimming the brake drum.	
		27	Job 20	Practice in nozzle grinding and lapping, setting of injection pressure and nature of spray.	

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