

LESSON PLAN

Name of Faculty	Sh. Visiting Faculty
Discipline	Automobile Engineering
Semester	1st
Subject	BAE
Lesson plan Duration	15 Weeks
Work Load per week	Theory(02)

WEEK	THEORY	
	Lecture	TOPIC
	Day	
1 st	1	Introduction Definition of automobile, Applications of automobiles, Classification of automobiles according to purpose, load capacity, fuel used, number of wheels, side of the drive, drive wheels, engine location & transmission;
2 nd	2	Leading manufacturers of scooter, motorcycles, car, bus and truck in India.
3 rd	3	Layout of two wheeler and four wheeler, Name and functions of their major assemblies,
4 th	4	assemblies, Types of drives – rear wheel drive, front wheel drive and four wheel drive.
5 th	5	Their merits and demerits. Chassis frame types - Conventional, semi-integral and integral.
6 th	6	Internal Viva Voce – 1
7 th	7	Automobile body and its types. Requirements of body,
8 th	8	Nomenclature of vehicle according to body. Types of car body, Constructional details of car body,

9 th	9	Body streamlining, Interior fittings -Rear view mirror, floor mats, upholstery, glove box, emergency flasher, air ventilators and Instrument panel.
10 th	10	Internal Viva Voce – 2
11 th	11	Introduction to power system, Various types of fuels, Internal and external combustion engines,
12 th	12	Major components of engine and their functions – cylinder, piston, connecting rod, crank shaft, piston pin, crank shaft pin, cylinder head, valves.
13 th	13	Engine terminology including bore, stroke,dead centres - TDC/BDC & ODC/IDC, engine capacity, Introduction to four stroke SI engine
14 th	14	Need of safety system, Active and passive safety, Various types of safety devices like helmet, seat belt, and air bags,
15 th	15	Definition of road safety, Road signs and signals. Road markings, Traffic light, Traffic police signals, Traffic rules, Tips for safe driving. Internal Viva Voce – 3

LESSON PLAN

Name of Faculty	Sh.VISHRUT / Arun Syan
Discipline	Automobile Engineering
Semester	1st
Subject	ENGINEERING GRAPHICS
Lesson plan Duration	15 Weeks
Work Load per week	Theory(06)

WEEK	THEORY	
	Lecture	TOPIC
	Day	
1 st	1	1. Introduction to Engineering Drawing and Graphics 1.1 Introduction to use and care of drawing instruments, drawing materials, layout and sizes of drawing sheets and drawing boards.
2 nd	2	1.2 Symbols and conventions a) Conventions of Engineering Materials, Sectional Breaks and Conventional lines. b) Civil Engineering Sanitary fitting symbols c) Electrical fitting symbols for domestic interior installations.
3 rd	3	1.3 Geometrical construction-geometrical figures such as triangles, rectangles, circles, ellipses and curves, hexagons, pentagons bisecting a line and arc, division of line and circle with the help of drawing instruments.
4 th	4	2. Technical Lettering of Alphabet and Numerals Definition and classification of lettering, Free hand (of height of 5,8,12 mm) and instrumental lettering (of height 20 to 35 mm) : upper case and lower case, single and double stroke, vertical and inclined (Gothic lettering) at 75 degree to horizontal and with suitable height to width ratio 7:4
5 th	5	3. Dimensioning 3.1 Necessity of dimensioning, method and principles of dimensioning (mainly theoretical instructions). 3.2 Dimensioning of overall sizes, circles, threaded holes, chamfered surfaces, angles, tapered surfaces, holes, equally spaced on P.C.D., countersunk holes, counter bored holes, cylindrical parts, narrow spaces and gaps, radii, curves and arches.
6 th	6	Internal Viva Voce – 1

7 th	7	4. Scales 4.1 Scales –Needs and importance (theoretical instructions), Type of scales, Definition of Representative Fraction (R.F.) and Length of Scale. 4.2 To draw/construct plain and diagonal scales.
8 th	8	UNIT II 1. Orthographic Projections 1.1 Theory of orthographic projections 1.2 Three views of orthographic projections of different objects of given pictorial view of a block in 1st and 3rd angle. 1.3 Projection of Points in different quadrant 1.4 Projection of Straight Line (1st angle) i. Line parallel to both the planes. ii. Line perpendicular to any one of the reference plane and parallel to others iii. Line inclined to any one of the references and parallel to another plane.
9 th	9	1.5 Projection of Plane – Different lamina like square rectangular, triangular, circle and Hexagonal pentagon. Trace of planes (HT and VT). 1.6 Identification of surfaces
10 th	10	2. Sectioning 2.1 Importance and salient features 2.2 Drawing of full section, half section, partial or broken out sections, Offset sections, revolved sections and removed sections (theoretical only). 2.3 Orthographic sectional views of different objects. Internal Viva Voce – 2
11 th	11	UNIT III 1. Introduction of projection of right solids such as prism & pyramid (square, Pentagon, Hexagonal) cube, cone & cylinder (Axes perpendicular to H.P and parallel to V.P.) Introduction of sections of right solids- Section planes, Sections of Hexagonal prism, pentagon pyramid, cylinder and cone (Section plane parallel to anyone reference planes and perpendicular to V.P. and inclined to H.P.)
12 th	12	Development of Surfaces– Development of lateral surfaces of right solids like cone, cylinder, pentagonal prism, pyramid and hexagonal pyramid (Simple problems)
13 th	13	UNIT IV

		1. Fundamentals of isometric projections and isometric scale 2. Isometric views of different laminas like circle, pentagon and hexagon.
14 th	14	Isometric views from given different orthographic projections(front, side and top view)
15 th	15	Introduction to AutoCAD Basic introduction and operational instructions of various commands in AutoCAD. Internal Viva Voce – 3

LESSON PLAN

Name of Faculty	Smt. Vishrut
Discipline	Automobile Engineering
Semester	1st
Subject	FUNDAMENTALS OF IT
Lesson plan Duration	15 Weeks
Work Load per week	Theory(02)

WEEK	THEORY	
	Lecture	TOPIC
	Day	
1 st	1	Brief history of development of computers, Definition of Computer, Block diagram of a
		Computer, Hardware, Software,
2 nd	2	Bootting: Cold and Hot Bootting, Interaction between the CPU
		and Memory with Input/Output devices,
3 rd	3	Function of CPU and major functional parts of CPU.
		Memory, Bit, Nibble, Byte, KB, MB, GB, TB, PB, Functions of memory, Use of storage devices
		in a Computer, List types of memory used in a Computer, Importance of cache memory, CPU
		speed and CPU word length
4 th	4	Understanding browser, Introduction to WWW, efficient use of search engines, awareness about
		Digital India portals (state and national portals) and college portals.
5 th	5	Advantages of Email,
		Various email service providers, Creation of email id, sending and receiving emails, attaching, documents with email and drive.
		Internal Viva Voce – 1

6 th	6	Effective use of Gmail,
7 th	7	G-Drive, Google Calendar, Google Sites, Google Sheets, Online mode of
		communication using Google Meet & WebEx
8 th	8	Introduction to Programming, Steps involved in problem solving, Definition of Algorithm,
		Definition of Flowchart,
9 th	9	Steps involved in algorithm development, differentiate algorithm and
		flowchart, symbols used in flowcharts, algorithms for simple problems, flowcharts for simple
		problems, Practice logic building using flowchart/algorithms
10 th	10	Office Tools like LibreOffice/OpenOffice/MSOffice.
		Internal Viva Voce – 2
11 th	11	OpenOffice Writer – Typesetting Text and Basic Formatting, Inserting Images, Hyperlinks,
		Bookmarks, Tables and Table Properties in Writer
12 th	12	Introducing LibreOffice/OpenOffice Calc, Working with Cells, Sheets, data, tables, using
		formulae and functions, using charts and graphics.
13 th	13	OpenOffice Impress – Creating and Viewing Presentations, Inserting Pictures and Tables, Slide
		Master and Slide Design, Custom Animation.
14 th	14	Introduction to Digital Marketing – Why Digital Marketing, Characteristics of Digital Marketing, Tools for Digital Marketing,
		Effective use of Social Media like LinkedIn, Google+, Facebook, Twitter, etc.:
15 th	15	Features of Social media, Advantages and Disadvantages of Social Media.
		Internal Viva Voce – 3

LESSON PLAN

Name of Faculty	Sh. Visiting Faculty
Discipline	Automobile Engineering
Semester	3rd
Subject	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING
Lesson plan Duration	15 Weeks
Work Load per week	Theory (02)

WEEK	THEORY	
	Lecture	TOPIC
	Day	
1 st	1	Application and Advantage of Electricity
	2	Difference between ac and dc, various applications of electricity, advantages of electrical energy over other types of energy
2 ND	3	Basic Electrical Quantities
	4	Definition of voltage, current, power and energy with their units, name of instruments used for measuring above quantities.
3 RD	5	Connection of these instruments in an electric circuit.
	6	AC Fundamentals, Electromagnetic induction-Faraday's Laws, Lenz's Law; Fleming's rules.
4 TH	7	Principles of a.c. Circuits; Alternating emf, Definition of cycle, frequency, amplitude and time period.
	8	Instantaneous, average, r.m.s and maximum value of sinusoidal wave; form factor and Peak Factor. Concept of phase and phase difference.
5 TH	9	Concept of resistance, inductance and capacitance in simple a.c. circuit. Power factor and improvement of power factor by use of capacitors.
	10	Sessional Test-I
6 TH	11	Concept of three phase system; star and delta connections; voltage and current relationship (no derivation).
	12	Transformers , Working principle and construction of single phase transformer, transformer ratio, emf equation.
7 TH	13	losses and efficiency, cooling of transformers, isolation transformer, CVT, auto transformer (brief idea), applications.
	14	Distribution System

8 TH	15	Difference between high and low voltage distribution system, identification of three-phase wires, neutral wire and earth wire in a low voltage distribution system.
	16	Identification of voltages between phases and between one phase and neutral.
9 TH	17	Difference between three-phase and single-phase supply.
	18	Electric Motor , Changing direction of rotation of a given 3 phase induction motor.
10 TH	19	Description and applications of single-phase and three-phase motors. Connection and starting of three-phase induction motors by star-delta starter.
	20	Sessional Test-II
11 TH	21	Motors used for driving pumps, compressors, centrifuge, dyers etc. Totally enclosed submersible and flame proof motors.
	22	Domestic Installation
12 TH	23	Distinction between light-fan circuit and single phase power circuit, sub-circuits.
	24	Identification of wiring systems. Common safety measures and earthing.
13 TH	25	Electrical Safety
	26	concept of fuses and their classification, selection and application, concept of earthing and various types of earthing, applications of MCBs and ELCBs.
14 TH	27	Basic Electronics , characteristics and applications of stepper motors and servo motors in process control. Basic idea of semiconductors – P and N type; diodes, zener diodes and their applications.
	28	Revision
15 TH	29	Revision
	30	Sessional Test-III

LESSON PLAN

Name of Faculty	Sh. Visiting Faculty
Discipline	Automobile Engineering
Semester	3rd
Subject	BASICS OF THERMODYNAMICS, HYDRAULICS AND PNEUMATICS
Lesson plan Duration	15 Weeks
Work Load per week	Theory (03 Hours+2 Practical)

WEEK	THEORY		Practicals
	Lecture	TOPIC	
	Day		
1st	1	UNIT I- A. Thermodynamics, Introduction, Energy, work and heat, Thermodynamic state and system, boundary, surrounding, universe	Measurement of temperature by thermocouple, pyrometer and infrared thermometer.
	2	Types of thermodynamic systems: closed, open, isolated, adiabatic	
	3	Thermodynamic properties: pressure, volume, temperature, enthalpy, internal energy, entropy	
2nd	4	Gas Laws, Definition of gas, Boyle's law,	Measurement of pressure head by piezometer tube and manometer
	5	Charle's law, Joule's law, Avogadro's law,	
	6	Regnault's law, Ideal and real gas,	
3rd	7	Characteristics equation, gas constant, universal gas constant.	Viva & Copy Check
	8	Specific heat at constant pressure, specific heat at constant volume of gas,	
	9	Vander-Wall's equation	
4th	10	Laws of Thermodynamic, Zeroth law of thermodynamics (concept only),	Verification of Bernoulli's theorem.
	11	First and second law of thermodynamics (concept only),	
	12	Steady flow energy equation,	
5th	13	Various thermodynamic processes - constant volume, constant pressure, isothermal,	To study the hydraulic circuit of an
	14	and free expansion processes; P-V & T-S diagrams (No Derivation)	

	15	Sessional test-I	automobile brake and hydraulic jack.
6th	16	Air Standard Cycle	Demonstration of use of hydraulic press.
	17	Definition of heat engine cycle	
	18	Carnot cycle,	
7th	19	net work done and air standard efficiency of Carnot cycle.	Dismantling and assembling of gear pump.
	20	UNIT III Hydraulics, Introduction	
	21	Fluids and non-fluids,	
8th	22	Liquid, gas and vapour	Viva & Copy Check
	23	Properties of fluids: Mass density,	
	24	specific weight, pressure,	
9th	25	specific volume, specific gravity, viscosity,	Demonstration of working of reciprocating air compressor.
	26	compressibility, vapour pressure,	
	27	Numerical Problems	
10th	28	surface tension, capillarity,	Inflating and deflating of tyre, checking of air pressure in tyre.
	29	Simple Numerical Problems	
	30	SESSIONAL TEST - 2	
11th	31	Fluid statics , Concept of pressure, static pressure and pressure head ,Types of pressure: Atmospheric pressure, gauge pressure, vacuum, absolute pressure, Measurement of pressure: U tube manometer, Bourdon gauge ,Pascal's law and its applications	Viva & Copy Check
	32	UNIT IV,Flow of Fluids,Types of fluid flow: steady and unsteady, uniform and non - uniform, laminar and turbulent	
	33	Rate of flow and its units,Continuity equation of flow	

12th	34	Bernoulli's theorem (without proof) and its applications, Simple problems	Demonstration of layout of a pneumatic system/circuit used in garage.
	35	Hydraulic Devices , Principle of working, Layout of hydraulic system,	
	36	Various components of hydraulic system and function of each component	
13th	37	Types of hydraulic pumps – reciprocating pump, centrifugal pump, gear type pump, screw pump,	Practice on pneumatic tools like pneumatic screw driver & pneumatic wrench
	38	vane type pump and their working, Description,	
	39	operation and application of hydraulic machines – hydraulic jack, hydraulic brake, hydraulic press.	
14th	40	UNIT V PNEUMATICS, Introduction, Basic concept of pneumatics, Layout of pneumatic system, Various components of pneumatic system and their functions,	Viva & Copy Check
	41	Construction and working of reciprocating and rotary air compressor,	
	42	Comparison of hydraulic system and pneumatic system. pneumatic system.	
15th	43	Pneumatic tools, Construction and working of pneumatic gun,	Viva & Copy Check
	44	Application of pneumatic gun as pneumatic screw driver, pneumatic wrench and pneumatic nut runner.	
	45	SESSIONAL TEST-III	

LESSON PLAN

Name of Faculty	Sh. Aakash Godara
Discipline	Automobile Engineering
Semester	3rd
Subject	AUTOMOBILE WORKSHOP PRACTICE
Lesson plan Duration	15 Weeks
Work Load per week	Practical (04 Hours)

WEEK	THEORY	
	Lecture	TOPIC
	Day	
1st	1	General safety procedures to be followed in automobile workshop; and familiarization to safety equipment and their uses.
	2	
	3	
2nd	4	Identification and sketching of general tools of automobile workshop and practice to use them.
	5	
	6	
3rd	7	Identification and sketching of special purpose tools and gauges of automobile workshop.
	8	
	9	
4th	10	Identification of IC engine components and chassis components.
	11	
	12	Cleaning of spark plug and gap adjustment.
5th	13	Removal and fitting of wheels and tyres of a two wheeler and repairing of punctures of Tube.
	14	
	15	SESSIONAL TEST –I
6th	16	Removal and fitting of wheels and tyres of car/jeep, tyre pressure measurement, repair of punctures of tubeless tyres.
	17	
	18	
7th	19	Washing, greasing, wiping and polishing of a vehicle.

	20	
	21	
8th	22	Washing, greasing, wiping and polishing of a vehicle.
	23	
	24	
9th	25	Removal, greasing and refitting of wheel bearing.
	26	
	27	
10th	28	Replacement of clutch wire and brake wire and transmission chain adjustment of a two wheeler.
	29	SESSIONAL TEST - 2
	30	
11th	31	Removal and refitting of radiator and water hoses.
	32	
	33	
12th	34	Removal and refitting of battery.
	35	
	36	
13th	37	Revision & Viva
	38	
	39	
14th	40	Revision & Viva
	41	
	42	SESSIONAL TEST – 3
15th	43	Revision & Viva
	44	Revision & Viva
	45	SESSIONAL TEST – 3

LESSON PLAN

Name of Faculty	Sh. Aakash Godara
Discipline	Automobile Engineering
Semester	3rd
Subject	WORKSHOP TECHNOLOGY-II
Lesson plan Duration	15 Weeks
Work Load per week	Theory (03 Hours)

WEEK	THEORY	
	Lecture	TOPIC
	Day	
1st	1	Resistance welding: Principle, advantages, limitations, working and applications of spot welding and seam welding Other Welding Processes: Principle, advantages, limitations,
	2	
	3	
2nd	4	Working and applications of Shielded metal arc welding, submerged arc welding. Welding defects, methods of controlling welding defects and inspection of welded joints.
	5	
	6	
3rd	7	Modern Welding Methods: Methods, Principle of operation, advantages, disadvantages and applications of, Tungsten inert gas (TIG) welding, Metal inert gas (MIG) welding, Thermit welding, Electro slag welding, Electron beam welding, Ultrasonic welding, Laser beam welding, Robotic welding
	8	
	9	
4th	10	UNIT II, Foundry Techniques, Pattern Making, Types of pattern, Pattern material, Pattern allowances, Pattern codes as per B.I.S., Introduction ,to cores, core boxes and core materials, Core making procedure, Core prints, positioning of cores
	11	Moulding and Casting, Moulding Sand: Properties of moulding sand, their impact and control of properties viz. permeability, refractoriness, adhesiveness, cohesiveness, strength, flowability, collapsibility, Various types of moulding sand, Testing of moulding sand.
	12	
5th	13	Mould Making: Types of moulds, Step involved in making a mould, Molding boxes, hand tools, used for mould making, Molding processes: Bench molding, floor molding, pit molding and machine molding. chamber, Centrifugal casting
	14	Casting Processes: Charging a furnace, melting and pouring both ferrous and non ferrous metals, cleaning of castings, Principle, working and applications of Die casting: hot chamber and cold chamber, Centrifugal casting
	15	SESSIONAL TEST –I

6th	16	Gating and Riser System: Elements of gating system, Pouring basin, sprue, runner, gates, Types of risers, location of risers, Directional solidification.
	17	Melting Furnaces: Construction and working of Pit furnace, Cupola furnace, Crucible furnace – tilting type, Electric furnace
	18	Casting Defects: Different types of casting defects, Non destructive testing (NDT) of castings: die penetration test, radiography, magnetic particle inspection and ultrasonic inspection.
7th	19	UNIT III, Shaping, Slotting and Planing
	20	Working principle and construction of shaper, slotter and planer
	21	Type of shapers and slotters
8th	22	Type of planers
	23	Quick return mechanism applied to shaper and planer machine.
	24	Work holding devices used on shaper and planer
9th	25	Types of tools used and their geometry.
	26	Specification of shaper and planer.
	27	Speeds and feeds in above processes.
10th	28	Broaching, Introduction to broaching
	29	Nomenclature of broach tools, types and material
	30	SESSIONAL TEST - 2
11th	31	Types of broaching machines – single ram and duplex ram horizontal type, vertical type pull up, pull down and push down.
	32	
	33	UNIT IV- Milling, Milling methods - up milling and down milling
12th	34	Specification and working principle of milling machine
	35	Classification, brief description and applications of milling machines Details of column and knee type milling machine
	36	Milling machine accessories and attachment – Arbors, adaptors, collets, vices, circular table, indexing head and tail stock, vertical milling attachment, rotary table.
13th	37	Identification of different milling cutters and work mandrels, Work holding devices
	38	Milling operations – face milling, angular milling, form milling, straddle milling and gang milling, Cutting parameters,
	39	

14th	40	UNIT V- Jigs and Fixtures,
	41	Importance and use of jigs and fixtures, difference between jig and fixture.
	42	Principal of location, Locating and clamping devices, Types of jigs – drilling jig, template jig and plate jig
15th	43	Types of fixtures – Milling and welding fixture
	44	Revision
	45	SESSIONAL TEST – 3

LESSON PLAN

Name of Faculty	Sh. Sh. Arun Syan/ Sh. Didar Singh
Discipline	Automobile Engineering
Semester	3rd
Subject	AUTO ENGINEERING DRAWING
Lesson plan Duration	15 Weeks
Work Load per week	Practical (04 Hours)

WEEK	THEORY	
	Lecture	TOPIC
	Day	
1st	1	UNIT I, Limits and Fits, Limit, tolerance, Geometrical Tolerance,
	2	deviation, allowance, fits: clearance, interference,
	3	Transition fit, Hole and shaft basis system.
2nd	4	Drawings of the following joints and bearings
	5	Universal joint assembly
	6	Bush bearing
3rd	7	Ball bearing and Roller bearing
	8	
	9	
4th	10	UNIT II, Drawing layout of the following Engine components
	11	Four Stroke Petrol Engine Piston
	12	Diesel Engine Piston
5th	13	Connecting rod Fuel injector
	14	Cam shaft and Crank shaft – 4 cylinder Engine
	15	1st Sessional Test
6th	16	UNIT III, Drawing layout of following components/system
	17	Wheel cylinder and Master cylinder
	18	Leaf Spring
7th	19	Lighting circuit of a typical car
	20	Side valve and overhead valve mechanism
	21	Revision

8th	22	UNIT IV, Cam Profile, Different types of cams and followers
	23	Drawing of cam profile for following motion of follower (without offset) : Uniform velocity motion
	24	
9th	25	Simple harmonic motion (SHM)
	26	
	27	Uniformly accelerated and retarded motion.
10th	28	
	29	Revision
	30	SESSIONAL TEST - 2
11th	31	Revision
	32	Uniformly accelerated and retarded motion.
	33	
12th	34	Revision
	35	UNIT V,Gears Nomenclature of gears
	36	
13th	37	Profile of spur gear by 'Approximate method'
	38	
	39	Profile of spur gear by "Unwin's Method'
14th	40	
	41	Revision
	42	Revision
15th	43	Revision
	44	SESSIONAL TEST – 3
	45	Revision

Lesson Plan

Name of the Faculty : Sh. Didar Singh

Discipline : Automobile Engg.

Semester : 3rd

Subject : STRENGTH OF MATERIALS

Lesson Plan Duration : 15 weeks

Work Load (Lecture/ Practical) per week (in hours): 03 HOURS /2 HOURS

	Theory	
Week		
	Lecture day	Topic (including assignment/ test)
1st	1	UNIT I: STRESSES AND STRAINS, Introduction about subject. Stresses and Strains
	2	Basic concept of load, stress and strain
	3	Tensile, compressive and shear stresses, Linear strain, Lateral strain, Shear strain, Volumetric strain.
2nd	4	Concept of Elasticity, Elastic limit and limit of proportionality
	5	Hook's Law and Elastic Constants
	6	Stress-strain curve for ductile and brittle materials, Nominal stress, Yield point, plastic stage
3rd	7	Ultimate stress and breaking stress
	8	Percentage elongation
	9	Proof stress and working stress, Factor of safety, Poisson's Ratio
4th	10	Thermal stress and strain, Longitudinal and circumferential stresses in seamless thin walled cylindrical shells.
	11	Introduction to Principal stresses
	12	UNIT II: RESILIENCE Strain Energy, Resilience, proof resilience and modulus of resilience
5th	13	Strain energy due to direct stresses and Shear Stress
	14	Stresses due to gradual, sudden and falling load.
	15	1st Sessional Test
6th	16	UNIT III: MOMENT OF INERTIA Concept of moment of inertia and second moment of area
	17	Radius of gyration, Theorem of perpendicular axis and parallel axis (with derivation)
	18	Second moment of area of common geometrical sections : Rectangle, Triangle, Circle (without derivation)

7th	19	Second moment of area for L,T and I section
	20	Section modulus
	21	UNIT IV: Bending Moment and Shearing Force, Concept of various types of beams, forms of loading
8th	22	Concept of various form of loading, Concept of end supports-Roller, hinged and fixed
	23	Concept of bending moment and shearing force
	24	B.M. and S.F. Diagram for cantilever subjected to concentrated load and U.D.L.
9th	25	B.M. and S.F. Diagram for simply supported beams with overhang subjected to concentrated and U.D.L.
	26	UNIT V: Bending stresses Theory of simple bending,
	27	Derivation of Bending Equation, Using bending equation
10th	28	Concept of moment of resistance
	29	Bending stress diagram
	30	2nd Sessional Test
11th	31	Section modulus for rectangular section
	32	Section modulus for circular section. Section modulus for symmetrical I section.
	33	Calculation of maximum bending stress in beams of rectangular section.
12th	34	Calculation of maximum bending stress in beams of circular section.
	35	Calculation of maximum bending stress in beams of T section.
	36	UNIT VI: Columns-Concept of column, Types of columns,
13th	37	modes of failure of columns, Buckling load, crushing load Slenderness ratio, Effective length
	38	End restraints, Factors effecting strength of a column, Strength of column by Euler Formula without derivation, Rankine Gordan formula (without derivation)
	39	UNIT VII: TORSION Concept of torsion, Difference between torque and torsion.
14th	40	Derivation of Torsion Equation, use of torsion equation for circular , shaft, (solid and hollow)
	41	Comparison between solid and hollow shaft with regard to their strength and weight. Power transmitted by shaft Concept of mean and maximum torque
	42	UNIT VIII: SPRINGS, Closed coil helical springs subjected to axial load and calculation of: stress deformation Stiffness and angle of twist and strain energy and proof resilience.
15th	43	calculation of: Stiffness and angle of twist and strain energy and proof resilience.
	44	Problems on Helical spring, Determination of number of plates of laminated spring (semi -elliptical type only) Problems on Leaf springs

LESSON PLAN

Name of Faculty **Sh.** Navneet Gupta
Discipline Automobile Engineering
Semester 5th
Subject Chasis Body and Transmission-II
Lesson plan Duration 15 Weeks
Work Load per week Theory (03 Hours)

WEEK	THEORY	
	Lecture	TOPIC
	Day	
1st	1.	UNIT-1 : Suspension System
		Functions of suspension system,
		Definition of sprung weight, unsprung weight, spring rate
	2.	Types of suspension springs – coil spring, leaf spring, torsion bar, air spring
	3.	Constructional details of leaf spring,
2nd	4.	Function and construction of variable rate spring and helper spring
	5.	Spring materials and their characteristics
	6.	Function of shock absorber, Principle, construction and working of telescopic shock absorber, concept of gas filled shock absorber
3rd	7.	Types of suspension systems – Rigid axle & Independent suspension system,
	8.	Independent suspension system – types and advantages Camber grading and nippling spring seats, Stabilizer bar
	9.	Pneumatic suspension system
4th	10.	Diagnosis of common faults and their rectifications
	11.	UNIT-II: Wheels and Tyres- Introduction to wheel assembly, Wheels – function, requirement and types
	12.	Constructional details of various types of wheels;wheel materials
5th	13.	Types of rim, Wheel specification,
	14.	Tyre – purpose & classification of tyres
	15.	Sessional test-I
6th	16.	Constructional details of tubed tyre and tubeless tyre & their comparison
	17.	Types of carcass – Cross ply, Radial ply and Mixed ply;
	18.	Comparison of cross- ply and radial-ply tyres

7th	19	Run flat tyres; Tyre materials, tyre dimension & specification
		Inflation pressure, under – inflation & over – inflation, Factors affecting excessive tyre wear
	20	Concept of balancing; Wheel balancing - Static and dynamic
	21	Tyre care & maintenance, Retreading of tyres.
8th	22	Hand brake or parking brake – Purpose, layout & working
		UNIT III: Braking System – I
	23	Purpose of Brakes; Principle of braking; stopping time & stopping distance
		Requirements of good braking system; Classification of brakes
	24	Drum brakes - Construction & working, leading & trailing shoes
9th	25	Disc brakes – Construction & working; Materials of brake shoe, brake drum, brake pad & brake lining
	26	Mechanical braking system – Layout & working, Hydraulic brakes – Principle, layout & working;
	27	Constructional details of master cylinder and wheel cylinder; Tandem master cylinder
10th	28	Brake fluid – specification and characteristics, Bleeding of brakes,
	29	Pedal travel; Heat generation and dissipation; brake fade
	30	SESSIONAL TEST - 2
11th	31	UNIT IV: Braking System – II Power brakes – definition, requirement & classification Vacuum Brakes – Principle, layout & working, Air Brakes – layout, components & working
	32	Air Hydraulic brakes – Layout, components & working
		Anti-skid & anti-lock devices; Brake tests
	33	Common braking system faults, their causes & rectification
12th	34	UNIT V: Automotive Safety
	35	Meaning of automotive safety; Active safety systems - Preventive design,
	36	Antilock Brake System, Electronic brake force distribution
13th	37	Electronic vehicle stability (EVS),
	38	Traction Control System
	39	Smart cruise control, Rear detection system
14th	40	Night vision system, Pedestrian protection system
	41	Rear detection system, Night vision system
	42	Passive safety systems – Design of vehicle for minimum injury, Seat belts
15th	43	Air bag; Crash test for safety, Burglar alarm & Immobilizer system for vehicle theft control
	44	Revision
	45	SESSIONAL TEST-III

LESSON PLAN

Name of Faculty	:	Sh. Navneet Gupta
Discipline	:	Automobile Engineering
Semester	:	5th
Subject	:	Chasis Body and Transmission-II
Lesson plan Duration	:	15 Weeks
Work Load per week	:	Practical (03)

WEEK	Lecture	Practicals
	Day	
1st	1	1. Study and sketching of independent suspension system. 2. Checking and servicing of telescopic shock absorber.
	2	
	3	
2nd	4	3. Removal, dismantling, servicing, assembling and refitting of leaf spring assembly
	5	
	6	
3rd	7	4. Wheel balancing using computerized wheel balancing machine and tyre rotation
	8	
	9	
4th	10	5. Replacement of brake shoe and adjustment of brake shoe clearance
	11	
	12	
5th	13	1st Sessional Test
	14	
	15	
6th	16	6. Servicing of mechanical brakes, adjustment of brake pedal free play.
	17	
	18	
7th	19	7. Servicing and repair of hydraulic brake system, bleeding of brakes.
	20	
	21	
8th	22	8. Study of mechanical hand brake system and required adjustments.
	23	
	24	
9th	25	Viva & Copy Check
	26	
	27	
10th	28	2nd Sessional Test
	29	

	30	
11th	31	9. Visit to local motor market to learn retreading of tyres
	32	
	33	
12th	34	10. Study of various safety systems i.e. seat belt, air bag etc. of a vehicle.
	35	
	36	
13th	37	Viva & Copy Check
	38	
	39	
14th	40	
	41	
	42	
15th	43	3rd Sessional Test
	44	
	45	

LESSON PLAN

Name of Faculty : Sh. Aakash Godara
Discipline : Automobile Engineering
Semester : 5th
Subject : AUTO ENGINE - II
Lesson plan Duration : 15Weeks
Work Load per week : Theory (03 Hours+ 02 Practicals)

WEEK	THEORY		Practical's
	Lecture	TOPIC	
	Day		
1st	1	UNIT-1. Combustion in I.C. Engines	Study & servicing of fuel feed system of diesel engine
		Phenomenon of combustion in S.I. engine:	
	2	Phases of combustion – Ignition lag, flame propagation and after burning;	
	3	Turbulence, Abnormal combustion,	
2nd	4	Pre ignition and Detonation;	Replacing fuel filter, inspection of fuel feed pump
	5	Octane rating	
	6	Phenomenon of combustion in C.I. engines:	
3rd	7	C.I. engines: phases of combustion;	Revision & Evaluation, Viva-Voce
	8	Ignition delay, uncontrolled combustion,	
	9	controlled combustion, after burning	
4th	10	Methods of producing air movements namely squish and swirl	Study & sketching of common rail direct injection (CRDI) fuel system
	11	Various types of combustion chambers for diesel engine	
		Diesel knock, cetane rating	
	12	UNIT-II: Fuel Supply System in Diesel Engine	
5th	13	Layout of fuel supply system in diesel engine and their types	Phasing and calibration of fuel injection pump
	14	Modern common rail direct injection (CRDI) system and individual pump system	
	15	Sessional Test-I	
6th	16	Fuel filters – primary and secondary,	Revision & Evaluation, Viva-Voce
	17	Fuel feed pumps; priming	
	18	Fuel injection pumps – plunger and barrel type, distributor type	
7th	19	Fuel injectors and their working	

	20	Governing and types of governors	Cleaning and testing fuel injectors used in petrol engines
	21	Supercharging of engines – function, advantages and disadvantages; types and location of superchargers	
8th	22	Turbochargers – types, function, working and advantages	Servicing of air cleaner – wet type and dry type
	23		
	24	UNIT III: Specialized Types of Engine , Wankel engine, Opposed piston opposed cylinder (OPOC) engine;	
9th	25	Fuel cell engine/ hydrogen engine;	Revision & Evaluation, Viva-Voce
	26	Homogeneous Charge Compression Ignition (HCCI) engine; Camless engine; CNG/LPG engine	
	27	Electrical / hybrid system/plug-in hybrid system,	
10th	28	Electric vehicle battery thermal Management system; Electric wheel motor;	Study of turbochargers
	29	Alternative automotive fuels (bio fuels) - fundamentals and future.	
	30	Sessional Test-II	
11th	31	Unit -IV . Engine faults and their rectifications Causes and rectification of: High oil consumption,	Analysis of exhaust gases of diesel engine using smoke meter Exhaust gas analyser.
	32	Causes and rectification of: Engine starting troubles, Causes and rectification of Engine overheating, engine misfiring	
	33	UNIT V: Emission Control ,Exhaust pollutants from petrol engines, Exhaust pollutants from diesel engines	
12th	34	Pollutants' effects on human beings and other materials, Sources of automotive emission	Revision & Evaluation, Viva-Voce
	35	Methods of emission control : improvement in engine design, exhaust gas treatment,	
	36	positive crankcase ventilation, exhaust gas recirculation, catalytic converters for petrol and diesel engines	
13th	37	Particulate filter, selective catalytic reduction technique, NOX absorbers, Emission norms (Bharat Stage).	Analysis of exhaust gases of petrol engine using exhaust gas analyser
	38		
	39		
14th	40	UNIT VI: Miscellaneous Topics	Evaluation, Viva-Voce
	41	Technologies to improve engine economy and output	
	42	Alternative automotive fuels; Engine specifications of an Indian car	
15th	43	Camless engine, Opposed piston opposed cylinder (OPOC) engine	Evaluation, Viva-Voce
	44	Revision	
	45	Sessional Test-III	

LESSON PLAN

Name of Faculty : Sh. Ravinder Sai
Discipline :Automobile Engineering
Semester :5th
Subject :AUTO ELECTRICAL SYSTEMS & ELECTRICAL VEHICLES
Lesson plan Duration :15 Weeks
Work Load per week : Theory (03 Hours)

WEEK	THEORY	
	Lecture	TOPIC
	Day	
1	1	Unit-I Introduction- Various Electrical and Electronics equipment components/systems in automobile, their functions and demands
	2	
	3	Earth return system, types of earthing, 6V, 12V and 48 V systems
2	4	Batteries - Lead Acid Batteries: construction working; elements, materials used
	5	
	6	Electrolyte and its strength, Effect of added plate area and temperature, rating,
3	7	Battery capacity, battery efficiency, temperature characteristics, terminal voltages charging and discharging
	8	Battery Testing: Electrolyte testing by hydrometer, voltage test, high rate discharge and cadmium test
	9	Battery Charging: Constant potential and constant current, initial charging, normal charging
4	10	trickle charging, intermittent charging, boost charging
	11	Battery Defects, Alkaline Batteries: Basic description, types, merits and demerits.
	12	Lithium ion battery: Construction and working
5	13	Concept of less maintenance and maintenance-free batteries
	14	Fuel cells- Principle of working and types of fuel cell
	15	Sessional Test-I
6	16	Unit-II Charging System, Circuits, function and various components- Types, construction, working, advantages and disadvantages of dynamo and alternators; cut out relay
	17	
	18	Types, construction, working, advantages and disadvantages of alternators, Charging system drives, cut out relay
7	19	Regulation: Need of regulation; working of regulators for dynamo and alternator.
	20	Starting System, Function of various components, torque terms- Principle and constructional details of starter motor, Switch types, Starter to engine drive and their types, Integrated starter generator.
	21	
8	22	Unit-III Lighting System, Various lighting circuits- head lamp: types and constructional details; sealed beam,

	23	
	24	double filament head lamps; Vertical and side control of lamps;
9	25	Fog light, side light, brake light, instrument light, indicator lights,
	26	reversing light, warning light, interior lights, LED lights.
	27	Wiring: HT and LT, their specifications,
10	28	Cable colour codes, wiring Harness, Cable connections,
	29	Wiring diagrams of cars Wiring diagrams of two-wheeler
	30	Sessional Test-II
11	31	Unit-IV Electrical & Electronics Accessories Working and functions of:- Speedometer - digital and analog, tachometer, front and rear Wind screen and rear wipers and washers,
	32	defogger and defroster, Electric door locks key less entry,
	33	Electric adjustable & foldable ORVM, parking sensor, follow me home headlamps, rain sensor.cruise control
12	34	Electronic Control Devices, Familiarization with automobile electronic devices,
	35	Working of ECU, Sensoring units
	36	Rectifiers, Analog and digital devices, immobilizer
13	37	Microprocessor and microcontroller – their applications, advance driver assistant systems (ADAS) and their levels; concept of regenerative braking system
	38	Unit-V Introduction to Electrical Vehicles
	39	Introduction to electric vehicle; Government policies for E-vehicles; types of EV- pure electrical, hybrid
14	40	plug-in hybrid; working principle of EV, motor controller; working of electric motor to wheel
	41	transmission system and its components; various drive modes in EV; types of batteries used in EV's;
	42	Lithium ion battery & Nickel Metal Hydride battery – their construction and working; Fuel cells -
15	43	Principle of working and types of fuel cell; Charging station layout.
	44	Revision
	45	Sessional Test-III

LESSON PLAN

Name of Faculty	Sh. Navneet Gupta
Discipline	Automobile Engineering
Semester	5th
Subject	AUTO PROFESSIONAL PRACTICES – I
Lesson plan Duration	15 Weeks
Work Load per week	Practical (04 Hours)

WEEK	THEORY	
	Lecture	TOPIC
	Day	
1st	1	Study of service manual of a new vehicle (Maruti/Tata/Hyundai etc.) as per manufacturer's recommendation.
2nd	2	Removal, inspection and refitting of steering wheel, steering box, pitman arm, tie rod and knuckle joint
3rd	3	Removal and refitting of various auto body assemblies
4th	4	Demonstration of body repair techniques.
5th	5	Sessional Test-I
6th	6	Testing of battery - specific gravity test using hydrometer, voltage test, high rate discharge test;Charging of battery using battery charger
7th	7	Testing of field winding of alternator and armature of starter motor for open circuit, short circuit and earthing.
8th	8	Testing and setting of Ignition timing, measurement and adjustment of spark plug gap.
9th	9	Engine testing and finding out fuel consumption
10th	10	Sessional Test-II
11th	11	Setting of valve timing and adjustment of tappet clearance.
12th	12	Removal and refitting of propeller shaft and universal joints.
13th	13	Service and repair of starter motor drive.
14th	14	Replacement of drive axles. Demonstration of Electric Vehicle working
15th	15	Sessional Test-III

LESSON PLAN

Name of Faculty	Sh. Rohtash Nehra
Discipline	Automobile Engineering
Semester	5th
Subject	DRIVING PRACTICE – I
Lesson plan Duration	15 Weeks
Work Load per week	Practical (04 Hours)

WEEK	THEORY	
	Lecture	TOPIC
	Day	
1st	1	Knowledge of general road safety and personal safety
2nd	2	Knowledge of Traffic rules, road signs and signals.
3rd	3	Knowledge of penal traffic offences
4th	4	Study of owner's manual of a vehicle
5th	5	Sessional Test-I
6th	6	Introducing the driving simulator & describe its features, such as steering wheel, pedals, dashboard display and screen.
7th	7	Driving practice on simulator
8th	8	• Identification of various controls of vehicle.
9th	9	Pre- Driving Daily inspection like engine oil, brake oil, coolant, tyre Pressure, light, horn, and any leakage.
10th	10	Sessional Test-II
11th	11	Starting the engine and warming up.
12th	12	• Operation of engaging and disengaging the clutch; Gear changing from low to high and high to low.
13th	13	Braking and use of brakes on the road, stopping distance and following distance.
14th	14	• Driving practice on road for steering control.
15th	15	Sessional Test-III

