

LESSON PLAN

NAME OF FACULTY: SUBASH CHANDER

DISCIPLINE: MECHANICAL ENGINEERING - G.P. AMBALA

SEMESTER: VI

SUBJECT: AUTOMOBILE ENGINEERING

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: (3 lectures /2 Practical's)

WEEK	THEORY		PRACTICALS
	LECTURE NO.	TOPIC	TOPIC
1 st	1	UNIT-1. Introduction 1.1 Automobile and its development.	1. Fault and their remedies in (i) Battery Ignition system (ii) magnetic Ignition system.
	2	1.2 Various types of automobiles manufactured in India.	
	3	1.3 Layout of chassis.	
2 nd	4	UNIT-2. Power System 2.1 Fuel systems for petrol and diesel engines	2. Demonstration of (i) Head Light Model (ii) Wiper and Indicators.
	5	Multi point fuel injection (MPFI), common rail direct injection (CRDI).	
	6	Fuel injectors and nozzles.	
3 rd	7	2.2 Comparison of MPFI with carburetor system.	3 Demonstration of (i) AC Pump (ii) SU Pump (iii) Master Cylinders.
	8	2.3 Concept of double overhead cam, single overhead cam.	
	9	Twin cam 16 valve technology in 4 cylinder engine.	
4 th	10	SESSIONAL TEST -I	4 Demonstration of (i) rear axle (ii) differential (Iii) Steering system.
	11	UNIT-3. Transmission System 3.1 Clutch - Function, Constructional details of single plate clutch.	
	12	Constructional details of multi plate friction clutches.	
5 th	13	Centrifugal and semi centrifugal clutch, Hydraulic clutch.	5 Fault finding practices on an automobile - four wheelers (petrol/diesel vehicles).
	14	3.2 Gear Box - Function, Concept of sliding mesh, constant mesh, and synchromesh gear box.	
	15	Torque converter and overdrive, 3.3 Types of drives – Front wheel, Rear wheel, Four Wheel.	
6 th	16	3.4 Function of Propeller shaft, Universal joint, Differential and Different types of Rear axles and Front Axles.	6 Tuning of an automobile engine.
	17	3.5 Wheels and Tyres - Types of wheels, Types and specifications of tyres used in Indian vehicles, Wheel balancing.	
	18	UNIT-4. Steering System Function and principle of Ackerman steering mechanism.	
7 th	19	Function and principle of Davis steering mechanism.	7 Driving practice on

	20	Types of steering gear boxes – Worm and nut, worm and wheel <small>cont.</small>	a 4-wheeler.
	21	Worm and roller, rack and opinion.	
8 th	22	Power steering system.	8 Charging of an automobile battery and measuring cell voltage and specific gravity of Electrolyte.
	23	Alignment of wheels – Toe in, toe out, camber, caster, kingpin inclination.	
	24	SESSIONAL TEST -II	
9 th	25	UNIT-5. Braking system Constructional details and working of mechanical brake. <small>cont.</small>	9 Changing of wheels and inflation of tyres, balancing of wheels.
	26	Constructional details and working of hydraulic brake. <small>cont.</small>	
	27	Concept of air and vacuum brake.	
10 th	28	Brake adjustment.	10 Checking spark gap and valve clearance.
	29	Introduction to Anti lock brake system and its working.	
	30	UNIT-6. Suspension System Function, Types of coil spring. <small>cont.</small>	
11 th	31	Working of coil spring.	11 Cleaning and adjusting a carburetor.
	32	Function, Types of leaf spring <small>cont.</small>	
	33	Working of leaf spring.	
12 th	34	Concept of Air suspension	Copy Checking / revision
	35	Shock absorber.	
	36	UNIT-7. Auto Electrical System Constructional details of lead acid cell battery.	
13 th	37	Maintenance of batteries.	Viva- voice
	38	Checking of batteries for voltage and specific gravity.	
	39	Magneto and Battery coil ignition system.	
14 th	40	Concept of Dynamo.	Viva- voice
	41	Alternator - Construction and working.	
	42	Charging of battery by Alternator and Regulator.	
15 th	43	SESSIONAL TEST -III	

LESSON PLAN

NAME OF FACULTY: ANEESH GUPTA/ HITESH CHAWLA

DISCIPLINE: MECHANICAL ENGINEERING – G.P. AMBALA

SEMESTER: VI

SUBJECT: INDUSTRIAL ENGINEERING

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: 4 PERIODS

WEEK	THEORY	
	LECTURE NO.	TOPIC
1 st	1	UNIT 1: Productivity: Introduction to productivity.
	2	Measurement of productivity.
	3	Introduction to productivity, factors affecting productivity.
	4	Causes of low productivity.
2 nd	5	Methods to improve productivity.
	6	Revision, Checking of class work and home assignment.
	7	UNIT 2: Work Study: Definition and scope of work study.
	8	Human aspects of work study.
3 rd	9	Method study and work measurement.
	10	Role of work study in improving productivity.
	11	Revision, Checking of class work and home assignment.
	12	UNIT 3: Method Study : Objectives of Method Analysis.
4 th	13	Procedure for Method analysis.
	14	Recording techniques.
	15	Information collection.
	16	SESSIONAL TEST -I
5 th	17	UNIT 4 :Motion Analysis
	18	Principles of Motion analysis.
	19	Therbligs and SIMO charts.
	20	Ergonomics
6 th	21	Revision, Checking of class work and home assignment.
	22	Normal work area and design of work places.
	23	UNIT 5 : Work measurement
	24	Objectives; work measurement techniques,
7 th	25	Stop watch, time study; principle
	26	Equipment used and procedure;

	27	Systems of performance rating;
	28	Calculation of basic times;
8 th	29	Various allowances.
	30	Calculation of standard time.
	31	Data and its usage.
	32	Work sampling.
9 th	33	Revision, Checking of class work and home assignment
	34	UNIT 6 : Wages and Incentive Schemes
	35	Introduction to wages.
	36	Wage payment for direct and indirect labor.
10 th	37	Wage payment plans and incentives.
	38	Various incentive plans.
	39	Incentives for indirect labor <i>continued</i>
	40	Incentives for indirect labor.
11 th	41	Revision, Checking of class work and home assignment
	42	SESSIONAL TEST -II
	43	UNIT 7 : Production Planning and Control
	44	Introduction,
12 th	45	Objectives and components (functions) of P.P.
	46	Objectives and components (functions) of P.P.C. <i>contd.</i>
	47	Advantages of production planning Production Control,
	48	Advantages of production planning Production Control <i>contd.</i>
13 th	49	Stages of P.P.C,
	50	Stages of P.P.C. <i>contd.</i>
	51	Process planning.
	52	Scheduling.
14 th	53	Routing.
	54	Route Sheets.
	55	Routing purpose.
	56	Dispatching and follow up.
15 th	57	Revision, Checking of class work and home assignment
	58	Revision, Checking of class work and home assignment
	59	VIVA- VOICE
	60	SESSIONAL TEST -II

LESSON PLAN

Name of Faculty: SH F. U. REHMAN/ SH. DALBIR SINGH

Discipline: MECHANICAL ENGINEERING – G.P. AMBALA

Semester: VI

Subject: EMPLOYABILITY SKILLS - II

Lesson plan Duration: 15 WEEKS

Work Load (Practical) per week: 2

WEEK	PRACTICAL	
	PRACTICAL DAY	TOPIC
1 st	1	Mock Interview concept, benefits
2 nd	2	Holding Mock interview
3 rd	3	How to face interview
4 th	4	Preparing for meeting, agenda preparation
5 th	5	Holding meeting, preparing minute of meeting
6 th	6	Preparation for group discussion, Taking turns
7 th	7	Group discussion – concept, types of group discussion
8 th	8	Holding group discussion
9 th	9	Seminar preparation
10 th	10	Holding seminars
11 th	11	Presentation : Elements of good presentation
12 th	12	Structure and tools of presentation
13 th	13	Paper reading
14 th	14	Power point presentation
15 th	15	Viva voce and evaluation

LESSON PLAN

NAME OF FACULTY: SH. F. U. REHMAN/ SH.J. S.NARANG

DISCIPLINE: MECHANICAL ENGINEERING – G.P. AMBALA

SEMESTER: VI

SUBJECT: EDM

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: 3 PERIODS

WEEK	THEORY	
	LECTURE NO.	TOPIC
1 st	1	UNIT-1. Introduction to EDM
	2	Concept /Meaning and its need
	3	Qualities and functions of entrepreneur and barriers in entrepreneurship
2 nd	4	Sole proprietorship and partnership forms of business organizations
	5	Schemes of assistance by entrepreneurial support agencies at National, State
	6	SFC's TCO, KVIB, DIC, Technology Business Incubator (TBI)
3 rd	7	Science and Technology Entrepreneur Parks (STEP).
	8	District level: NSIC, NRDC, DC:MSME, SIDBI
	9	NABARD, Commercial Banks
4 th	10	Assessment of demand and supply in potential areas of growth
	11	UNIT-2. Market Survey and Opportunity Identification
	12	Scanning of business environment
5 th	13	Salient features of National and State industrial policies and resultant business opportunities
	14	Considerations in product selection Types and conduct of market survey
	15	Identifying business opportunity
6 th	16	Types of market survey
	17	Conduct of market survey
	18	SESSIONAL TEST -I
7 th	19	UNIT-3. Preliminary project report
	20	Project report Preparation
	21	Detailed project report including technical, economic and market feasibility
8 th	22	Common errors in project report preparations
	23	Exercises on preparation of project report
	24	UNIT-4. Introduction to Management Definitions and importance of management.

9 th	25	Functions of management: Importance and Process of planning, organising, staffing, directing and controlling
	26	Types of industrial organizations: Line organization, Line and staff organization, Functional Organisation
	27	Principles of management (Henri Fayol, F.W. Taylor) Concept and structure of an organisation
10 th	28	UNIT-5: Leadership and Motivation Leadership: Definition and Need
	29	Qualities and functions of a leader, Motivation: Definitions and characteristics
	30	Factors affecting motivation
11 th	31	Manager Vs leader
	32	Types of leadership
	33	Theories of motivation (Maslow, Herzberg, McGregor)
12 th	34	SESSIONAL TEST -II
	35	UNIT-6: Management Scope in Different Areas Human Resource Management : Introduction and objective, Introduction to Man power planning, recruitment and selection Introduction to performance appraisal methods
	36	Material and Store Management: Introduction functions, and objectives,
13 th	37	ABC Analysis and EOQ
	38	Marketing and sales: Introduction, importance, and its functions
	39	Physical distribution, Introduction to promotion mix, Sales promotion
14 th	40	Financial Management :Introductions, importance and its functions
	41	Elementary knowledge of income tax, sales tax, excise duty, custom duty and VAT
	42	UNIT-7: Miscellaneous Topics Customer Relation Management (CRM), Definition and need,Types of CRM
15 th	43	Total Quality Management (TQM) :Statistical process control, Total employees Involvement, Just in time (JIT)
	44	Intellectual Property Right (IPR) :Introductions, definition and its importance, Infringement related to patents, copy right, trade mark
	45	SESSIONAL TEST -III

LESSON PLAN

NAME OF FACULTY: SH. BHARAT BHUSHAN

DISCIPLINE: MECHANICAL ENGINEERING – G.P. AMBALA

SEMESTER: VI

SUBJECT: INSPECTION AND QUALITY CONTROL

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: (4 THEORIES /2 PRACTICAL)

WEEK	THEORY		PRACTICALS
	LECTURE NO.	TOPIC	TOPIC
1 st	1	1. Inspection Introduction, units of measurement,	1 Use of dial indicator for measuring taper.
	2	Standards for measurement and Inspection interchangeability	
	3	International, national and company standard, inspection.	
	4	Line and wavelength standards.	
2 nd	5	Planning of inspection: what to inspect? When to inspect?	2 Use of combination set, bevel protector and sine bar for measuring taper.
	6	Who should inspect? Where to inspect?	
	7	Types of inspection: remedial, preventive	
	8	Operative inspection, incoming, in-process and final inspection	
3 rd	9	Study of factors influencing the quality of manufacture.	Copy Checking / revision
	10	2. Measurement and Gauging Measurement and Gauging: Basic principles used in measurement	
	11	Gauging, mechanical, optical,	
	12	Electrical and electronic.	
4 th	13	Study of various measuring instruments like: calipers, micrometers	3 Measurement of thread characteristic using vernier and gauges.
	14	Dial indicators, surface plate	
	15	Straight edge, try square	
	16	Protectors	
5 th	17	Sine bar, clinometers,	Copy Checking / revision
	18	Comparators – mechanical	
	19	Electrical	
	20	Pneumatic.	
6 th	21	Slip gauges	4 Use of slip gauge in measurement of center distance between two pins.
	22	Tool room microscope	
	23	Profile projector	
	24	Limit gauges: plug, ring, snap, taper	

7 th	25	Thread, height, depth, form,	Copy Checking / revision
	26	Feeler, wire and their applications for linear, angular, surface, thread and gear measurements.	
	27	Gauge tolerances	
	28	SESSIONAL TEST -I	
8 th	29	Geometrical parameters and errors. Errors & their effect on quality, concept of errors	5 Use of tool maker's microscope and comparator.
	30	Measurement of geometrical parameter such as straightness, flatness and parallelism.	
	31	Study of procedure for alignment tests on lathes, drilling and milling machines.	
	32	Testing and maintenance of measuring instruments.	
9 th	33	3. Statistical Quality Control Statistical Quality Control Basic statistical concepts	Copy Checking / revision
	34	Empirical distribution and histograms	
	35	Frequency, mean, mode	
	36	Standard deviation, normal distribution	
10 th	37	Binomial and Poisson, Simple- examples.	6 Plot frequency distribution for 50 turned
	38	Introduction to control charts, namely X, R	
	39	P and C charts and their applications.	
	40	Sampling plans, selection of sample size.	
11 th	41	Method of taking samples	Copy Checking / revision
	42	Frequency of samples.	
	43	Inspection plan format and test reports	
	44	SESSIONAL TEST -II	
12 th	45	4. Modern Quality Concepts: Modern Quality Concepts	7 With the help of given data, plot X, R, P and C charts
	46	Concept of total quality management (TQM)	
	47	National and International Codes.	
	48	National and International Codes.	
13 th	49	ISO-9000, concept and its evolution	7 With the help of given data, plot X, R, P and C charts
	50	ISO-9000, concept and its evolution	
	51	QC tools	
	52	QC tools	
14 th	53	(Introduction to Kaizen, 5S	Viva-voice,
	54	(Introduction to Kaizen, 5S	
	55	5. Instrumentation: Measurement of mechanical quantities such as displacement	
	56	Vibration, frequency	
15 th	57	Pressure	Viva-voice
	58	Temperature	
	59	By electro mechanical transducers of resistance, capacitance & inductance type.	
	60	SESSIONAL TEST -III	

LESSON PLAN

NAME OF FACULTY: SH. DEVSUMAN VERMA

DISCIPLINE: MECHANICAL ENGINEERING – G.P. AMBALA

SEMESTER: IV

SUBJECT: MATERIAL AND METALLURGY

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: THEORY- (3 PERIODS/ 2PERIODS)

WEEK	THEORY		PRACTICALS
	LECTURE NO.	TOPIC	TOPIC
1 st	1	1. Introduction Material, History of Material Origin, Scope of Material Science.	1. Classification of about 25 specimens of materials/machine parts into (i) Metals and non metals (ii) Metals and alloys (iii) Ferrous and non ferrous metals (iv) Ferrous and non ferrous alloys
	2	Overview of different engineering materials and applications.	
	3	Classification of materials, Thermal, Chemical and Electrical properties of various materials.	
2 nd	4	Mechanical properties of various materials, Present and future needs of materials.	2. Given a set of specimen of metals and alloys (copper, brass, aluminum, cast iron, HSS, Gun metal); identify and indicate the various properties possessed by them.
	5	Overview of Biomaterials and semi- conducting materials.	
	6	Various issues of Material Usage-Economical, Environment and Social.	
3 rd	7	2.Crystallography Fundamentals of Crystal, Unit Cell, Space Lattice,	Copy Checking/revision
	8	Arrangement of atoms in Simple Cubic Crystals, BCC, FCC and HCP Crystals,	
	9	Number of atoms per unit Cell, Atomic Packing Factor	
4 th	10	Deformation: Overview of deformation behavior and its mechanisms,	3. Study of heat treatment furnace.
	11	Behavior of material under load and stress-strain.	
	12	Failure Mechanisms: Overview of failure modes, fracture, fatigue and creep.	
5 th	13	SESSIONAL TEST-I	4. Study of a metallurgical microscope and a specimen polishing
	14	3. Metals And Alloys Introduction: History and development of iron and steel.	

	15	Different iron ores, Raw Materials in Production of Iron and Steel.	machine.
6th	16	Basic Process of iron-making and steel-making,	Copy Checking/revision
	17	Classification of iron and steel.	
	18	Cast Iron: Different types of Cast Iron, manufacture and their usage.	
7th	19	Steels: Steels and alloy steel,	5. To prepare specimens of following materials for microscopic examination and to Examine the microstructure of the specimens of following materials: i) Brass ii)Copper iii)Grey iv)Malleable v)Low carbon steel vi)High carbon steel vii) HSS
	20	Classification of plain carbon steels,	
	21	Availability, Properties and usage of different types of Plain Carbon Steels,	
8th	22	Effect of various alloys on properties of steel,	6. To anneal a given specimen and find out difference in hardness as a result of annealing.
	23	alloy steels (high speed steel, stainless steel,	
	24	Uses of spring steel, silicon steel	
9th	25	Non Ferrous Materials: Properties and uses of Light Metals and their alloys,	Copy Checking/revision
	26	properties and uses of White Metals and their alloys.	
	27	4. Theory of Heat Treatment Purpose of heat treatment,	
10th	28	Solid solutions and its types,	7. To normalize a given specimen and to find out the difference in hardness as a result of normalizing.
	29	Iron Carbon diagram,	
	30	Formation and decomposition of Austenite, Martensitic Transformation – Simplified Transformation Cooling Curves	
11th	31	SESSIONAL TEST-II	8. To harden and temper a specimen and to find out the difference in hardness due to tempering.
	32	various heat treatment processes- hardening, tempering, annealing, normalizing, Case hardening and surface hardening	
	33	Types of heat treatment furnaces required for above operations (only basic idea)	
12th	34	5. Engineering Plastics Important sources of plastics,	Copy Checking/revision
	35	Classification-thermoplastic and thermo set and their uses.	
	36	Various Trade names of Engg. Plastics, Plastic Coatings.	
13th	37	6. Advanced Materials	Copy Checking/revision

		Composites-Classification, properties, applications	
	38	Ceramics-Classification, properties.	
	39	applications Heat insulating materials	
14th	40	7. Miscellaneous Materials Asbestos, Glass wool,	Viva-voice
	41	Properties and uses of thermocole, cork, mica.	
	42	Overview of tool and die materials,	
15th	43	Materials for bearing metals, Spring materials,	Viva-voice
	44	Materials for Nuclear Energy, Refractory materials.	
	45	SESSIONAL TEST-III	

LESSON PLAN

NAME OF FACULTY: RAM NIWAS

DISCIPLINE: MECHANICAL ENGINEERING – G.P. AMBALA

SEMESTER: IV

SUBJECT: HYDRAULICS AND HYDRAULIC MACHINES

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: THEORY-

WEEK	THEORY		PRACTICALS
	LECTURE NO	TOPIC	TOPIC
1 st	1	1. Introduction Fluid, types of fluid; properties of fluid viz mass density, weight density (specific weight),	1. Measurement of pressure head by employing. i) Piezometer tube ii) Single and double column manometer
	2	specific volume, capillarity, specific gravity, viscosity,	
	3	compressibility, surface tension, kinematic viscosity and dynamic viscosity and their units.	
2 nd	4	2. Pressure and its Measurement 2.1 Concept of pressure (Atmospheric Pressure, gauge pressure, absolute pressure).	2. To find out the value of coefficient of discharge for a venturimeter.
	5	Pascal's Law, Static Pressure 2.2 Pressure measuring devices: peizometer tube manometers - simple U-tube	
	6	Pressure measuring devices: Differential single column including simple problems	
3 rd	7	Pressure measuring devices: Inverted U-tube including simple problems	Copy Checking/revision
	8	Pressure measuring devices: micro manometer including simple problems	
	9	2.3 Bourdon pressure gauge, Diaphragm pressure gauge,	
4 th	10	Dead weight pressure gauge	3. Measurement of flow by using venturimeter.
	11	SESSIONAL TEST-I	
	12	3. Flow of Fluids Types of fluid flow – steady and unsteady, uniform and non-uniform, laminar and turbulent;	
5 th	13	rate of flow and their units; continuity equation of flow;	4. Verification of Bernoulli's theorem.
	14	potential energy of a flowing fluid; total head;	
	15	Bernoulli's theorem (statement and proof) and its applications	
6 th	16	Discharge measurement with the help of venturi-meter	Copy Checking/revision
	17	Discharge measurement with the help of orifice meter.	

	18	Discharge measurement with the help of pitot-tube, limitations of Bernoulli's theorem simple problems.	
7 th	19	4.Flow through Pipes 4.1 Definition of pipe flow, wetted perimeter,	5. To find coefficient of friction for a pipe (Darcy's friction).
	20	hydraulic mean depth, hydraulic gradient; loss of head due to friction;	
	21	Chezy's equation and Darcy's equation of head loss (without proof), Reynold's number and its effect on pipe friction; siphon,	
8 th	22	Nozzle - definition, velocity of liquid flowing through the nozzle, power developed.	6. To study hydraulic circuit of an automobile brake and hydraulic ram.
	23	Water hammer, anchor block, syphon, surge tank (concept only).	
	24	4.2 Loss of head in pipes due to sudden enlargement, sudden contraction, obstruction on flow path, change of direction and pipe fittings (without proof)	
9 th	25	SESSIONAL TEST-II	Copy Checking/revision
	26	5. Flow through Orifices : Cc, Cv, Cd,	
	27	flow through drowned orifices	
10 th	28	flow through partially drowned orifices	7. Study the working of a Pelton wheel and Francis turbine.
	29	time for emptying a tank through a circular orifice. Simple problems	
	30	6. Hydraulic Machines: Description, operation and application of hydraulic systems –	
11 th	31	Description, operation and application of hydraulic ram, hydraulic jack,.	8. To study a single stage centrifugal pump for constructional details and its operation to find out its normal head and discharge.
	32	Description, operation and application of hydraulic brake	
	33	hydraulic accumulator, hydraulic door closer, hydraulic press,	
12 th	34	selection of specification of above systems for different applications	Copy Checking/revision
	35	7. Water Turbines and Pumps 7.1 Concept of a turbine, types of turbines – impulse and reaction type, difference between them.	
	36	Construction and working of pelton wheel, Francis turbine.	
13 th	37	Construction and working of Propeller and Kaplan turbines.	Copy Checking/revision
	38	Unit speed, unit power, unit discharge, specific speed of turbines, selection of turbines based on specific speed.	
	39	7.2 Concept of hydraulic pump, single acting reciprocating pump (construction and operation only)	
14 th	40	vane, screw and gear pumps.	VIVA - VOICE
	41	7.3 Construction, working and operation of centrifugal pump.	
	42	Performance, efficiencies and specifications of a centrifugal pump.	

15th	43	Trouble shooting and problems in centrifugal pumps and remedial measures, pitting, cavitations, priming	VIVA - VOICE
	44	VIVA - VOICE	
	45	SESSIONAL TEST-III	

LESSON PLAN

NAME OF FACULTY: ANEESH KUMAR GUPTA HITESH CHAWLA

DISCIPLINE: MECHANICAL ENGINEERING – G.P. AMBALA

SEMESTER: IV

SUBJECT: MACHINE DESIGN AND DRAWING

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: THEORY- (2 PERIOD/6 PERIODS)

WEEK	THEORY		PRACTICAL
	LECTURE NO.	TOPIC	TOPIC
1st	1	1. Introduction 1.1 Design – Definition, Type of design, necessity of design 1.1.1 Comparison of designed and undersigned work	1.1.2 Design procedure
	2	1.1.3 Characteristics of a good designer 1.2 Design terminology: stress, strain, factor of safety, factors affecting factor of safety, stress concentration	Methods to reduce stress concentration
2nd	3	1.2.1 General design consideration 1.2.2. Codes and Standards (BIS standards)	1.3 Engineering materials and their mechanical properties : 1.3.1 Properties of engineering materials: elasticity, plasticity, malleability, ductility, toughness, hardness and resilience,
	4	Fatigue, creep, tenacity, strength.	Design related problems related to stress, strain, factor of safety
3rd	5	1.3.2 Selection of materials, criterion of material selection	2. Design Failure 2.1 Various design failures- maximum stress theory,
	6	Maximum strain theory, maximum strain energy theory	Maximum strain theory, maximum strain energy theory
4th	7	2.2 Classification of loads	2.3 Design under tensile, compressive and torsional loads.
	8	SESSIONAL TEST-I	Numerical on design for various types of loads
5th	9	3. Design of Shaft 3.1 Type of shaft, shaft materials, Type of loading on shaft, standard sizes of shaft available	3.2 Shaft subjected to torsion only, determination of shaft diameter (hollow and solid shaft) on the basis of :

			- Strength criterion - Rigidity criterion.
5 th	10	3.3 Determination of shaft dia (hollow and solid shaft) subjected to bending	Problems related to determination of shaft dia (hollow and solid shaft) subjected to bending
6 th	11	3.3 Determination of shaft dia (hollow and solid shaft) subjected to bending	Problems related to determination of shaft dia (hollow and solid shaft) subjected to bending.
	12	3.4 Determination of shaft dia (hollow and solid shaft) subjected to combined torsion and bending	Problems related to determination of shaft dia (hollow and solid shaft) subjected to combined torsion and bending
7 th	13	4. Design of Key 4.1 Types of key, materials of key, functions of key	Drawing of different types of Keys
	14	4.2 Failure of key (by Shearing and Crushing).	Problems related to failure of key (by Shearing and Crushing).
8 th	15	4.3 Design of key (Determination of key dimension)	Problems related to design of key (Determination of key dimension)
	16	4.4 Effect of keyway on shaft strength. (Figures and problems).	Problems related to Effect of keyway on shaft strength. (Figures and problems).
9 th	17	5. Design of Screwed Joints 5.1 Introduction, Advantages and Disadvantages of screw joints, location of screw joints.	Drawing sheet on threads
	18	5.2 Important terms used in screw threads, designation of screw threads	5.3 Initial stresses due to screw up forces, stresses due to combined forces
10 th	19	5.3 Initial stresses due to screw up forces, stresses due to combined forces	5.4 Design of power screws (Press, screw jack, screw clamp)
	20	5.4 Design of power screws (Press, screw jack, screw clamp)	Problem related to power screws
11 th	21	SESSIONAL TEST-II	Problems on shafts, keys, screws
	22	6. Cams (03) 6.1 Types of cams and followers (theoretical)	Drawing sheet on cams and followers
12 th	23	6.2 Profile of cams for imparting following motion with knife edge and roller followers □□Uniform motion □□Simple harmonic motion _{cont..}	Drawing sheet on cams
	24	6.2 Profile of cams for imparting following motion with knife edge and roller followers *Uniform motion *Simple harmonic motion	Drawing sheet on cams
13 th	25	Profile of cams for imparting following motion with knife edge and roller followers *Uniformity accelerated and retarded motion _{cont..}	Drawing sheet on cams
13 th	26	Profile of cams for imparting following motion with knife edge and roller	Drawing sheet on cams

		followers *Uniformity accelerated and retarded motion	
14th	27	7. Gears (02 hrs) 7.1 Nomenclature of gears and conventional representation	Drawing sheet on Nomenclature and conventional representation of gears.
	28	7.2 Drawing the actual profile of involute teeth gear by different methods cont..	7.2 Drawing the actual profile of involute teeth gear by different methods
15th	29	7.2 Drawing the actual profile of involute teeth gear by different methods	7.2 Drawing the actual profile of involute teeth gear by different methods
	30	SESSIONAL TEST-II	Viva-voice

LESSON PLAN

NAME OF FACULTY: SANJEEV KUMAR

DISCIPLINE: MECHANICAL ENGINEERING – G.P. AMBALA

SEMESTER: IV

SUBJECT: WORKSHOP TECHNOLOGY

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: THEORY- (3 PERIODS)

WEEK	THEORY	
	LECTURE NO.	TOPIC
1 st	1	1. Cutting Tools and Cutting Materials 1.1. Cutting Tools - Various types of single point cutting tools and their uses.
	2	Single point cutting tool geometry, tool signature and its effect
	3	Heat produced during cutting and its effect, Cutting speed, feed and depth of cut and their effect.
2 nd	4	1.2 Cutting Tool Materials - Properties of cutting tool material, Study of various cutting tool materials viz. High-speed steel, tungsten carbide, cobalt steel cemented carbides, stellite, ceramics and diamond.
	5	2. Lathe 2.1 Principle of turning
	6	2.2 Function of various parts of a lathe
3 rd	7	2.3 Classification and specification of various types of lathe
	8	2.4 Work holding devices
	9	2.5 Lathe tools and operations :- Plain and step turning, facing, parting off, taper turning, eccentric turning, drilling, reaming, boring, threading and knurling, form turning, spinning.
4 th	10	2.6 Cutting parameters – Speed, feed and depth of cut for various materials and for various operations, machining time.
	11	2.7 Speed ratio, preferred numbers of speed selection.
	12	2.8 Lathe accessories:- Centers, dogs, different types of chucks, collets, face plate, angle plate, mandrel, steady rest, follower rest cont..
5 th	13	2.8 Lathe accessories:- Centers, dogs, different types of chucks, collets, face plate, angle plate, mandrel, steady rest, follower rest,
	14	Taper turning attachment, tool post grinder, milling attachment, Quick change device for tools. Cont..
	15	Taper turning attachment, tool post grinder, milling attachment, Quick change device for tools.
6 th	16	2.9 Introduction to capstan and turret lathe
	17	SESSIONAL TEST-I
	18	3. Drilling 3.1 Principle of drilling. 3.2 Classification of drilling machines and their description.

7 th	19	3.2 Classification of drilling machines and their description.
	20	3.3 Various operation performed on drilling machine – drilling, spot facing, reaming, boring, counter boring, counter sinking, hole milling, tapping.
	21	3.4 Speeds and feeds during drilling, impact of these parameters on drilling, machining time.
8 th	22	3.5 Types of drills and their features, nomenclature of a drill
	23	3.6 Drill holding devices.
	24	4. Boring 4.1 Principle of boring 4.2 Classification of boring machines and their brief description.
9 th	25	4.2 Classification of boring machines and their brief description.
	26	4.3 Boring tools, boring bars and boring heads.
	27	5. Shaping, Planing and Slotting 5.1 Working principle of shaper, planer and slotter.
10 th	28	5.2 Type of shapers 5.3 Type of planers
	29	5.4 Types of tools used and their geometry.
	30	5.5 Speeds and feeds in above processes.
11 th	31	SESSIONAL TEST-II
	32	6. Broaching 6.1 Introduction 6.2 Types of broaching machines – Single ram and duplex ram horizontal type, vertical type pull up, pull down, push down.
	33	6.2 Types of broaching machines – Single ram and duplex ram horizontal type, vertical type pull up, pull down, push down.
12 th	34	6.3 Elements of broach tool, broach tooth details – nomenclature, types, and tool material.
	35	7. Jigs and Fixtures 7.1 Importance and use of jigs and fixture
	36	7.2 Principle of location
13 th	37	7.3 Locating devices
	38	7.4 Clamping devices 7.5 Advantages of jigs and fixtures
	39	8. Cutting Fluids and Lubricants (08 hrs) 8.1 Function of cutting fluid 8.2 Types of cutting fluids
14 th	40	8.2 Types of cutting fluids
	41	8.3 Difference between cutting fluid and lubricant 8.4 Selection of cutting fluids for different materials and operations
	42	8.4 Selection of cutting fluids for different materials and operations
15 th	43	8.5 Common methods of lubrication of machine tools.
	44	VIVA - VOICE
	45	SESSIONAL TEST-III

LESSON PLAN

NAME OF FACULTY: ASHWANI KUMAR

DISCIPLINE: MECHANICAL ENGINEERING – G.P. AMBALA

SEMESTER: IV

SUBJECT: I.C. ENGINES

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (LECTURE/PRACTICAL) PER WEEK: THEORY- (3 PERIODS)

WEEK	THEORY		PRACTICAS
	LECTURE NO.	TOPIC	TOPIC
1 st	1	1. IC Engines (09 hrs) 1.1 Introduction 1.2 Working principle of two stroke and four stroke cycle	1. Study of a two stroke engine using cut section model, note the function and material of each part.
	2	SI engines and CI engines,	
	3	Otto cycle,	
2 nd	4	diesel cycle	2. Study of a four stroke engine using cut section model. Note the function of each part.
	5	and dual cycle	
	6	1.3 Location and functions of various parts of IC engines and materials used for them	
3 rd	7	1.4 Concept of IC engine terms: bore, stroke, dead centre, crank throw,	Copy Checking/revision
	8	compression ratio, piston displacement, piston speed	
	9	2. Fuel Supply in Petrol Engine (08 hrs) 2.1 Concept of carburetion	
4 th	10	2.2 Air fuel ratio	3. Study of battery ignition system of a multi-cylinder petrol engine stressing ignition timings, setting, fixing order and contact breaker; gap adjustment.
	11	2.3 Simple carburetor and its application	
	12	MPFI,	
5 th	13	Common rail system,	4. Study of cooling of IC engine.
	14	super charging and turbo charger	
	15	Proben soving	
6 th	16	SESSIONAL TEST-I	Copy Checking/revision
	17	3. Fuel System of Diesel Engine (06 hrs) 3.1 Components of fuel system	
	18	3.2 Description and working of fuel feed pump	
7 th	19	3.2 Description and working of fuel feed pump	5. Study of lubricating

	20	3.3 Fuel injection pump	system of IC engine.
	21	3.4 Injectors	
8th	22	4. Ignition System of IC Engines (06 hrs) 4.1 Description of battery coil and magnet ignition system	6. Determination of BHP by dynamometer.
	23	4.1 Description of battery coil and magnet ignition system	
	24	4.2 Electronic ignition system	
9th	25	4.3 Fault finding in ignition system and remedial action	Copy Checking/revision
	26	SESSIONAL TEST-II	
	27	5. Cooling and Lubrication (10 hrs) 5.1 Function of cooling system in IC engine	
10th	28	5.2 Air cooling and water cooling system, use of thermostat, radiator and forced circulation in water cooling (description with line diagram)	7. Morse test on multi-cylinder petrol engine.
	29	5.2 Air cooling and water cooling system, use of thermostat, radiator and forced circulation in water cooling (description with line diagram)	
	30	5.2 Air cooling and water cooling system, use of thermostat, radiator and forced circulation in water cooling (description with line diagram)	
11th	31	5.3 Function of lubrication	8. Local visit to roadways or private automobile workshops.
	32	5.4 Types and properties of lubricant	
	33	5.5 Lubrication system of engine	
12th	34	5.6 Fault finding in cooling and lubrication and remedial action	Copy Checking/revision
	35	5.6 Fault finding in cooling and lubrication and remedial action	
	36	6. Testing of IC Engines (09 hrs) 6.1 Engine power - indicated and brake power	
13th	37	6.2 Efficiency - mechanical, thermal. relative and volumetric	Viva-Voice
	38	6.3 Methods of finding indicated and brake power	
	39	6.4 Morse test for petrol engine	
14th	40	6.5 Heat balance sheet	Viva-Voice
	41	6.6 Concept of pollutants in SI and CI engines, pollution control, norms for twoor four wheelers – BIS – I, II, III and IV methods of reducing pollution in IC engines,	
	42	6.6 Concept of pollutants in SI and CI engines, pollution control, norms for twoor four wheelers – BIS – I, II, III and IV methods of reducing pollution in IC engines,	
15th	43	alternative fuels like CNG and LPG	Comiplation
	44	Viva-voice	
	45	SESSIONAL TEST-III	

LESSON PLAN

NAME OF FACULTY: J S NARANG

DISCIPLINE: MECHANICAL ENGINEERING – G.P. AMBALA

SEMESTER: 2nd

SUBJECT: ENGINEERING DRAWING – II

LESSON PLAN DURATION: 15 WEEKS

WORK LOAD (PRACTICAL) PER WEEK: PRACTICAL-6(3+3)

WEEK	PRACTICAL	
	PRACTICAL DAY	TOPIC
1 st	1	Unit 1 Detail and Assembly Drawing (2 sheets) Principle and utility of detail and assembly drawings Wooden joints i.e. corner mortice and tenon joint, Tee halving joint, Mitre faced corner joint.
	2	Tee bridle joint, Crossed wooden joint, Cogged joint, Dovetail joint, Through Mortise and Tenon joint, furniture drawing - freehand and with the help of drawing instruments
2 nd	3	Unit 2 Screw threads and threaded fasteners (8 sheets) Thread Terms and Nomenclature Types of threads-External and Internal threads, Right and Left hand threads (Actual and Conventional representation), single and multiple start threads.
	4	Different Forms of screw threads-V threads (B.S.W threads, B.A thread, American National and Metric thread), Square threads (square, Acme, Buttress and Knuckle thread)
3 rd	5	Nuts and Bolts Different views of hexagonal and square nuts and hexagonal headed bolt
	6	Assembly of Hexagonal headed bolt and Hexagonal nut with washer. Assembly of square headed bolt with hexagonal and with washer.
4 th	7	Locking Devices Different types of locking devices-Lock nut, castle nut, split pin nut, locking plate, slotted nut and spring washer.
	8	Foundations bolts-Rag bolt, Lewis bolt, curved bolt and eye bolt.
5 th	9	Drawing of various types of machine screw, set screw,
	10	studs and washer
6 th	11	Unit 3 Keys and Cotters (3 sheets) Various types of keys and cotters and their practical application
	12	Preparation of drawing of various keys and cotters showing keys and cotters in position
7 th	13	Various types of joints (3 sheets) Spigot and socket joint
	14	Gib and cotter joint
8 th	15	Knuckle joint

	16	Unit4 Rivets and Riveted Joints (4 sheets) Types of general purpose-rivets heads Caulking and fullering of riveted joints
9th	17	Types of riveted joints
	18	Lap joint-Single riveted, double riveted (chain and zig-zag type)
10th	19	Single riveted, Single cover plate butt joint (chain type)
	20	Single riveted, double cover plate butt joint (chain type)
11th	21	Double riveted, double cover plate butt joint(chain and zig-zag type)
	22	Unit 5 Couplings (2 sheets) Flange coupling (Protected and non-protected),
12th	23	muff coupling
	24	half-lap muff coupling
13th	25	Unit 6 Symbols and Conventions (2 sheets) Civil engineering sanitary fitting symbols
	26	Electrical fitting symbols for domestic interior installations
14th	27	Unit 7 AUTO CAD (for practical and viva-voce only) Concept of AutoCAD, Tool bars in AutoCAD, coordinate system, snap, grid, and ortho mode
	28	Drawing commands – point, line, arc, circle, ellipse
15th	29	Editing commands – scale, erase, copy, stretch, lengthen and explode
	30	Viva voce and final evaluation