STRENGTH OF MATERIALS
AUTOMOBILE ENGINEERING
SEM-3RD

LIST OF PRACTICALS

1. Tensile test on bars of Mild steel and Aluminium.
2. Bending tests on a steel bar or a wooden beam.
3. Impact test on metals

a) Izod test

b) Charpy test

4. Torsion test on specimens of different metals for determining modulus of rigidity.
5. To determine the stiffness of a helical spring and to plot a graph between load and extension.
6. Hardness test on different metals.

BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING
AUTOMOBILE ENGINEERING
SEM-3RD

LIST OF PRACTICALS

1. Connection of a three-phase motor and starter with fuses and reversing of direction of rotation
2. Connection of a single-phase induction motor with supply and reversing of its direction of rotation
3. To test a battery for its charged and discharged condition.
4. Identify the different faults in a domestic wiring system
5. Connection and reading of an electric energy meter with supply and load using ammeter, voltmeter, wattmeter
6. Study of a distribution board for domestic installation
7. Ohm's law verification
8. Verification of law of resistance in series
9. Verification of law of resistance in parallel
10. Draw V-I characteristics of P-N junction diode
11. Draw input and output characters of a transistor
12. Draw reverse break down characteristics of a zener diode

MANUFACTURING TECHNOLOGY – I
AUTOMOBILE ENGINEERING

SEM-3RD

LIST OF PRACTICALS

1. Fitting shop

Bench work and fittings; simple male-female fitting (fitting of pulley, bearings, gears on shafts), scraping, pipe fittings with leak proof joints, checking alignment and centre distance

2. Pattern making and foundry shop

- To prepare pattern of rectangular block, 'V' block, step pulley with core box, split pattern
- Preparation of open floor mould of solid pattern, cope drag mould using split pattern
- Visit to foundry to see castings of cast iron, steel, non-ferrous materials, hand moulding, machine moulding and melting furnaces. Induction heating and gas fired furnaces

3. Lathe

- Introduction to turning machine and allied services like cutting tool grinding, general shop layout including maintenance, oils, tools and gauge stores.
- Different exercises in turning like plain turning, step-turning, facing, chamfering, knurling, parting off and thread cutting, use of compound slide and tailstock, tool grinding, selection of coolant and lubricants and speed and feeds. Use of safety goggles.

AUTOMOBILE ENGINEERING DRAWING
AUTOMOBILE ENGINEERING

SEM-3RD

DETAILED CONTENTS

Assembly Drawings of the following automotive components:

1. Joints and Bearings (04 sheets)
- Universal joint,
- Slip joint
- Bush bearing
- Ball bearing
- Roller bearing

2. Engine Components (06 sheets)
- Four Stroke Petrol Engine Piston
- Four Stroke Diesel Engine Piston
- Connecting rod
- Crank shaft – 4 cylinder Engine
- Spark Plug

3. Gears (03 sheets)
- Nomenclature of gears
- Profile of spur gear by 'Approximate method'
- Profile of spur gear by "Unwin's Method'

4. Cam Profile (03 sheets)
- Different types of cams and followers
- Drawing of cam profile for following motion of follower (without offset)

a. Uniform velocity motion
b. Simple harmonic motion (SHM)
c. Uniformly accelerated and retarded motion.

AUTO WORKSHOP

AUTOMOBILE ENGINEERING

SEM-3RD

DETAILED CONTENTS

1. Identification and sketching of general tools of automobile workshop and practice to use them
2. Identification and sketching of special tools and gauges of automobile workshop and practice to use them
3. Identification and sketching of major components in the layout of chassis of a scooter/motor cycle/3 wheeler
4. Identification and sketching of major components in layout of chassis of a car/jeep, truck/bus
5. Removal and fitting of wheels and tyres of car/jeep and rotation of tyres, tyre pressure, use of gauges
6. Removal and fitting of wheels and tyres of a two wheeler and repairing of punctures.
7. Cleaning, greasing, checking as per maintenance schedule of two wheelers
8. Cleaning, greasing, checking as per maintenance schedule for washing, wiping and polishing of jeep/car
9. Flushing out water jackets, cleaning of radiator and refitting in vehicle, adjustment of fan belt tension.

MATERIALS AND METALLURGY
AUTOMOBILE ENGINEERING
SEM-4TH

LIST OF PRACTICALS

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. Given a set of specimen of metals and alloys (copper, brass, aluminium, cast iron, HSS, Gun metal); identify and indicate the various properties possessed by them.
3. Study of heat treatment furnace.
4. Study of a metallurgical microscope and a specimen polishing machine.
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
6. To anneal a given specimen and find out difference in hardness as a result of annealing.
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7. To normalize a given specimen and to find out the difference in hardness as a result of normalizing.
8. To harden and temper a specimen and to find out the difference in hardness due to tempering.

AUTO ENGINE – I
AUTOMOBILE ENGINEERING
SEM-4TH

LIST OF PRACTICALS

1. Servicing of lubricating system
2. Servicing of fuel systems in petrol engines
3. Servicing of fuel injector
4. Servicing of F.I.P (Fuel Injection Pump)
5. Engine tune up
6. Study of turbocharger
7. Servicing of cooling system
8. Study of engine block
9. Servicing of fuel system in diesel engine
10. Study of M.P.F.I engine

MANUFACTURING TECHNOLOGY – II
AUTOMOBILE ENGINEERING
SEM-4TH

LIST OF PRACTICALS

1. Introduction to drilling and boring machines, an exercise of simple drilling and boring operation, selection of speeds and feeds, use of jigs and fixtures and coolant.
2. Simple exercises on shaper
3. Practice on horizontal and vertical milling machines, work holding devices and types of milling cutters
4. Practice on cylindrical and centreless grinding machine, selection, dressing and storage of grinding machines. Use of lubricants
5. Practice on honing machines with selection of honing sticks, honing and finish pattern in the bore. Bore geometry measurement
6. Observe working of CNC machines including setting of cutting parameters and dimensions and loading of tools, repeatability of operation and adjustment for wear allowances
7. Visit to industry (sheet metal shoos) to observe bending and forming operation and use of dies
8. Use of appropriate coolant and lubricants for all machining operation in the workshop and during Industrial visits.

CHASSIS, BODY AND TRANSMISSION – I
AUTOMOBILE ENGINEERING
SEM-4TH

LIST OF PRACTICALS

1. Study and sketches of Heavy and Light vehicle chassis.
2. Identify and servicing of single plate and multi plate clutch.
3. Study and sketch of centrifugal clutch.
4. Servicing and overhauling of constant mesh and synchromesh gear box
5. Servicing of universal joints, slip joint and propeller shaft
6. Servicing of differential, adjustment of crown and pinion backlash.
7. Checking and adjustment of steering geometry, camber, caster, Toe-in, Toe-out, kingpin inclination.
8. Study of live axles.

COMPUTER AIDED DRAFTING
AUTOMOBILE ENGINEERING
SEM-4TH

PRACTICE WORK

1. Introduction to AutoCAD : Starting up, practice on – how to create a new drawing file, setting drawing limits & saving a file, drawing lines in different ways using absolute coordinates, user co-ordinates, WCS, UCS, drawing circles, drawing arcs, drawing ellipses.
Drawing polygons, drawings splines. Drawing polylines, using window, zoom commands.
2. Practice on Edit commands such as erase, copy, mirror, array, offset, rotate, oops, undo, redo, scale, stretch, trim, break, extend, chamfer, fillet, O snap command
3. Practice on Text commands: editing text, text size, text styles, change properties commands.
4. Practice on Layer Commands: creating layer, freeze, layer on/off colour assigning, current layer, load line type, lock & unlock layer, move from one layer to other.
5. Practice on Hatching, Hatch pattern selection.
6. Practice on Dimensioning, linear dimensioning, angular dimensioning radius/.diameter dimensioning O-snap command, aligned dimensioning, editing of dimensioning, tolerances in dimensioning.
7. Practice on print/plot commands. Export/import commands.
8. Practice on making complete drawings of components by doing following exercises:
a) Detail and assembly drawing of the following using AUTOCAD (2D) (4 sheets)
- Plummer Block
- Wall Bracket
- Stepped pulley, V-belt pulley
- Flanged coupling
- Machine tool Holder (Three views)
- Screw jack or knuckle joint

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b) Isometric Drawing by CAD using Auto CAD (one sheet)
Drawings of following on computer:
- Cone
- Cylinder
- Isometric view of objects

9. Modelling (02 sheets)
3D modelling, Transformations, scaling, rotation, translation
10. Creating Chamfer and Fillet
Practice on surface modeling, create part file, practice on assembly of parts, creating assembly view, orthographic views, section view (Practice on different views, practice on data transfer)
11. Introduction to Other Softwares;
(Pro Engineer/CATIA / Inventor/Unigraphics/Solid Work: Salient features.