

Course Code	Course Name	Hours per Week			Total	Total
		L	T	P	Hrs.	Credits
EN3ES08	Engineering Workshop	0	0	2	2	1

Unit-1 Carpentry Shop

Introduction to various carpentry tools and equipments like Cutting Tools-rip saw, tenon saw, firmer chisel, mortise chisel, iron jack plane, wooden jack plane, Tools-braces, drill bits , Striking Tools-hammers, mallet etc., Holding Tools-bench vice, G-cramp , Miscellaneous Tools- rasps, files, screw driver, pincer etc., Timber : Type, Qualities of timber disease, Timber grains, Structure of timber, Timber seasoning, Timber preservation .Wood Working tools: joints & joinery. Wood sizing exercise in planning, marking, sawing, chiseling and grooving to make half lap joint and cross lap joint

Unit –II Fitting Shop

Study and use of Measuring instruments, Engineer steel rule, Surface gauges caliper, Height gauges, feeler gauges, micro meter. Different types of files, File cuts, File grades, Use of surface plate, Surface gauges drilling tapping Fitting operations: Chipping filling, Drilling and tapping.

Unit–III Foundry, Forging and Smithy

Pattern Making: Study of Pattern materials, pattern allowances and types of patterns. Core box and core print, .Use and care of tools used for making wooden patterns.

Moulding: Properties of good mould & Core sand, Composition of Green, Dry and Loam sand.

Black Smithy Shop: Use of various smithy tools. Forging operations: Upsetting, Drawing down, Fullering, Swaging and Cutting down, Methods used to prepare simple green and bench and pit mould dry sand bench mould using single piece and split patterns.

Unit– IV Welding

Study and use of tools used for Brazing, Soldering, Gas & Arc welding. Preparing Lap & Butt joints using gas and arc welding methods, Study of TIG & MIG welding processes. Safety precautions.

Unit–V Machine Shop

Study of machine tools in particular Lathe machine (different parts, different operations, study of cutting tools).Demonstration of different operations on Lathe machine Practice of Facing, Plane Turning, step turning, taper turning, knurling and parting. Study of Quick return mechanism of Soks haper.

Text Books

1. B.S. Raghuwanshi, Workshop Technology Vol. I & II, Dhanpath Rai & Sons.
2. K.C. John, Mechanical Workshop Practice. 2nd Edn. PHI.
3. Hajra Choudhury, Hajra Choudhary and Nirjhar Roy, Elements of Workshop Technology, vol. I Media promoters and Publishers Pvt. Ltd.
4. J.P. Kaushish., Manufacturing Processes, Prentice Hall India.

References Books:

1. W. A.J. Chapman, Workshop Technology, 1998, Part -1, 1st South Asian Edition, Viva Book Pvt. Ltd.
2. P.N. Rao, 2009, Manufacturing Technology, Vol.1, 3rd Ed., Tata McGraw Hill Publishing Company.

List of Practicals

1. **General:** Studies of mechanical tools, components and their applications:
 - i. Tools: Screw drivers, spanners, Allen keys, Cutting pliers etc. And accessories
 - ii. Components: Bearings, seals, O-rings, circlips, keys etc.
2. **Carpentry:** Any one model from the following:
 - i. T-Lap joint
 - ii. Cross lap joint
 - iii. Dovetail joint
 - iv. Mortise joint
3. **Smithy:**
 - i. Demonstrating the forgability of different materials (MS, Al, Alloy steel and Cast steel) in cold and hot states.
 - ii. Observing the qualitative differences in the hardness of these materials
 - iii. Determining the shape and dimensional variations of Al test specimen due to forging under different states by visual inspection and measurements
4. **Foundry:** Any one exercise from the following
 - i. Bench moulding
 - ii. Floor moulding
 - iii. Core making
5. **Sheet metal:** Any one exercise from the following Making
 - i. Cylindrical
 - ii. Conical
 - iii. Prismatic shaped jobs from sheet metal
6. **Welding:** Any one exercise from the following Making joints using Electric arc welding. Bead formation in horizontal, vertical and overhead positions
7. **Fitting and Assembly:** Filing exercise and any one of the following exercises Disassembling and reassembling of
 - i. cylinder piston assembly
 - ii. Tail stock assembly
 - iii. Time piece/clock
 - iv. Bicycle or any machine.
8. **Machines:** Demonstration and applications of Drilling machine, Grinding machine, Shaping machine, Milling machine and lathe.