

Syllabus for JT- Workshop

Section-1 (70% weightage)

Engineering Materials: Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials.

Casting, Forming and Joining Processes: Different types of castings, design of patterns, moulds and cores; solidification and cooling. Fundamentals of hot and cold working processes; forging, rolling, extrusion, drawing and sheet metal forming processes. Principles of welding, brazing and soldering.

Machining and Machine Tool Operations: Basic machine tools; single and multi-point cutting tools, tool geometry and materials, tool life and wear; principles of non-traditional machining processes; principles of jigs and fixtures.

Metrology and Inspection: Limits, fits and tolerances; linear and angular measurements; comparators; gauge design; surface finish measurement; alignment and testing methods.

CAD & CAM: Basic concepts of CAD/CAM and their integration tools.

Section-2 (30% weightage)

Strength of Materials and Design: Stress and strain, elastic constants, Poisson's ratio; shear force and bending moment diagrams; bending and shear stresses; deflection of beams; testing of materials with universal testing machine; testing of hardness and impact strength. Principles of the design of machine elements such as bolted, riveted and welded joints; shafts, gears.

Fluids and Thermal Engineering: Fluid properties; fluid statics, manometry, Bernoulli's equation; dimensional analysis; flow through pipes, head losses in pipes, bends and fittings. Modes of heat transfer; conduction, free and forced convective heat transfer; radiative heat transfer. Thermodynamic systems and processes; laws of thermodynamics, calculation of work and heat in various processes. Air and gas compressors; vapour and gas power cycles, I.C. Engines: Air-standard Otto, Diesel and dual cycles. Refrigeration and air-conditioning: Vapour and gas refrigeration.

Mathematics: Geometry, Trigonometry, Matrices, Analytical geometry, Algebra.