



GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

DRAUGHTSMAN MECHANICAL

(Duration: Two Years)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 5



SECTOR – CAPITAL GOODS AND MANUFACTURING



Directorate General of Training

DRAUGHTSMAN MECHANICAL

(Engineering Trade)

(Revised in 2019)

Version: 1.2

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL - 5

Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE

EN-81, Sector-V, Salt Lake City,

Kolkata – 700 091

www.cstaricalcutta.gov.in

1. COURSE INFORMATION

During the two-year duration, a candidate is trained on subjects- Professional Skill, Professional Knowledge, Workshop Science & Calculation and Employability Skills related to job role. In addition to this, a candidate is entrusted to make/do project work and extra curricular activities to build up confidence. The practical skills are imparted in simple to complex manner & simultaneously theory subject is taught in the same fashion to apply cognitive knowledge while executing task. The practical part starts with basic freehand sketches and conventional drawing using instruments. At the end of the course, skill is developed with computer aided production drawing and detailing. The broad components covered under Professional Skill subject are as follows:

FIRST YEAR: This year includes construction of geometrical figures using drawing instruments, freehand drawing of machine components in correct proportions, procedure to prepare a drawing sheet as per BIS standard. After becoming familiar with basic drafting terminology, students begin to develop multi-view drawings and learning about projection methods, auxiliary views and section views. Lettering, tolerance, metric construction, technical sketching and orthographic projection, isometric drawing, oblique and perspective projection are also covered. Introduction of drawing of different fasteners, welds, and locking devices as per specification mentioned in SP-46:2003 and use of CAD technology in 2D environment. The candidate also imparted training on allied trades viz. Fitter, Turner, Machinist, Sheet Metal Worker, Welder, Foundryman, Electrician and Maintenance Motor Vehicles. The safety aspects covers components like OSH&E, PPE, Fire extinguisher, First Aid and in addition 5S being taught.

SECOND YEAR: To develop skill in CAD application practical assignments are given by using commands in various methods. Detail and assembly drawing of machine parts viz., Pulleys, Pipe fittings, Gears and Cams applying range of cognitive and practical skills. Construct production drawing applying quality concept in CAD. Creation of objects in 3D Modeling Space and generate views, print preview to plot in drawing and pdf format. Individual skill is developed by preparing production drawing of machine parts applying conventional sign and symbol by taking measurement. Impart knowledge to draw workshop layout of a production industry considering process path and human ergonomics. In SolidWorks/AutoCAD Inventor/ 3D modeling environment the assignment is to create and plot assembly and detailed views of machine parts with dimensions, annotations, title block and bill of materials.

Professional Knowledge subject is simultaneously taught in the same fashion to apply cognitive knowledge while executing task. In addition components like physical properties of engineering materials, interchangeability, method of expressing tolerance as per BIS Fits, different types of iron, properties and uses, special files, honing, metallurgical and metal working processes such as heat treatment, the various coatings used to protect metals, different

bearing, working material with finished surface as aluminium, duralumin and stainless steel, topics related to non-ferrous metals, method of lubrication are also covered under theory part.

At the end part of each year, the trainees should express their skills by presenting project works. In addition to above components the core skills components viz., workshop calculation & science, employability skills are also covered. These core skills are essential skills which are necessary to perform the job in any given situation.

Learning outcomes are a reflection of total competencies of a trainee and assessment will be carried out as per the assessment criteria.

5.1 LEARNING OUTCOMES (TRADE SPECIFIC)

FIRST YEAR:

1. Construct different Geometrical figures using drawing Instruments following safety precautions.
2. Draw orthographic Projections giving proper dimensioning with title block and heading using appropriate line type and scale.
3. Construct free hand sketches of simple machine parts with correct proportions.
4. Construct plain scale, comparative scale, diagonal scale and vernier scale.
5. Draw Sectional views showing orthographic projections.
6. Develop surface and interpenetration of solid in orthographic projection.
7. Draw isometric projection from orthographic views (and vice-versa) and draw oblique projection from orthographic views.
8. Draw and indicate the specification of different types of fasteners, welds and locking devices as per SP-46:2003
9. Acquire basic knowledge on tools and equipment of Allied trades viz. Fitter, Turner, Machinist, Sheet Metal Worker, Welder, Foundry man, Electrician and Maintenance Motor Vehicles.
10. Construct different types of gears, couplings and bearings with tolerance dimension and indicating surface finish symbol.
11. Perform computer application and Create 2D objects on CAD drawing space using commands from ribbon, menu bar, toolbars and by typing in command prompt.

SECOND YEAR:

12. Construct projection views of geometrical figures with dimension and annotation on CAD in model space and viewport in layout space.
13. Draw in CAD detail and assembly drawing of machine parts viz., Pulleys, Pipe fittings, Gears and Cams applying range of cognitive and practical skills.
14. Construct drawing of engine parts with detailed and assembly in template layout applying quality concept in CAD.
15. Create 3D solid by switching to 3D modeling workspace in CAD, generate views, Print Preview and Plotting.

16. Construct detailed and assembled drawing applying conventional sign & symbols using CAD.
17. Prepare drawing of machine part by measuring with gauges and measuring instruments.
18. Draw a machine shop layout considering process path and ergonomics (human factor).
19. Create and plot assembly and detail views of machine part with Dimensions, Annotations, Title Block and Bill of materials in Solid Works/AutoCAD Inventor/ 3D Modeling.
20. Create production drawing of machine part.