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

COMPETENCY BASED CURRICULUM

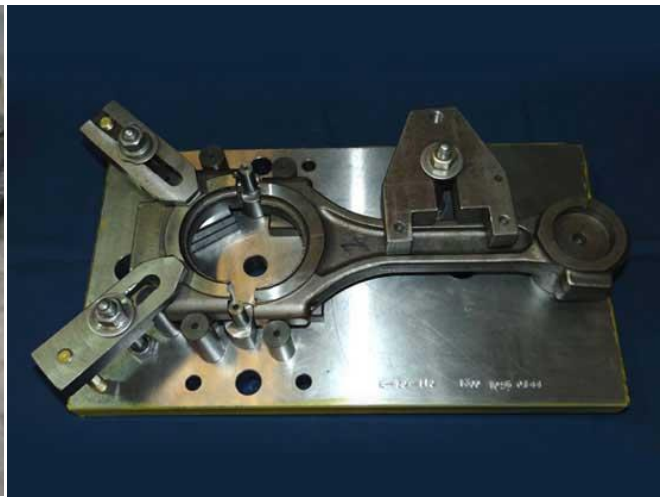
TOOL & DIE MAKER

(PRESS TOOLS, JIGS & FIXTURES)

(Duration: Two Years)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 5



SECTOR –CAPITAL GOODS AND MANUFACTURING

Directorate General of Training

TOOL & DIE MAKER

(Press Tools, Jigs & Fixture)

(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

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1. COURSE INFORMATION

During the two years duration, a candidate is trained on subjects- Professional Skill, Professional Knowledge, Engineering Drawing, 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 course covers the detail aspect of mould making& testing. The broad components covered under Professional Skill subject are as below:

FIRST YEAR: The practical part starts with basic fitting covering components like filing, sawing, drilling, tapping, chipping, grinding and different fits. The accuracy proposed is of ±0.05mm and angular accuracy of 1°. Different turning operations on lathe viz., plain, facing, boring, grooving, step turning, parting, chamfering, knurling and different thread cutting by setting the different parameter, are covered in the practical part.

Different milling operations (plain, stepped, angular, dovetail, T-slot, contour, gear) along with surface & cylindrical grinding to an accuracy of ±0.02mm are covered. In addition, solid modeling of mould in CAD & Pro E taught setting and execution of welding is also a component in this year.

SECOND YEAR: Setting, operation and programming of CNC turn centre and CNC machining center to produce components are performed. 2D & 3D machining with CAM software is also performed. Manufacture drill jig and fixture is also part of the practical. EDM & wire EDM operation to produce components with an accuracy of ±0.02mm is covered. Construction of blanking and piercing tool is done and testing of same is also performed.

Basic construction of Hydraulic & Pneumatic circuits and basic functioning of electrical circuit and sensors are covered. Construction of compound and progressive tools is done testing of same is executed. Simple repair and overhauling of different machines viz., drill, milling & lathe is covered. Making of 'V' bending tool and draw tool are carried out and testing is also undertaken.

5. LEARNING OUTCOME

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. Plan and organize the work to make job as per specification applying different types of basic fitting operation and check for dimensional accuracy following safety precautions. [Basic fitting operation – Filing, Marking, Hack sawing, Drilling, Taping, chipping and Grinding etc. Accuracy: ± 0.1mm]
2. Make different fit of components for assembling as per required tolerance observing principle of interchangeability and check for functionality. [Different Fit –Open, Angular, & Square Fit; Required tolerance: ±0.05 mm, angular tolerance: 1 degree.]
3. Set different shaped jobs on different chuck and demonstrate conventional lathe machine operation observing standard operation practice. [Different chucks:3 jaws & 4 jaws, different shaped jobs: round, square, hexagonal]
4. Prepare different cutting tool to produce jobs to appropriate accuracy by performing different turning operations. *Different cutting tool – V tool, side cutting, parting, thread cutting (both LH & RH),Appropriate accuracy: ±0.06mm, Different turning operation – Plain, facing, drilling, boring (counter & stepped), grooving, Parallel Turning, Step Turning, parting, chamfering, U -cut, Reaming, internal recess, knurling.*
5. Set the different machining parameters to produce threaded components applying method/ technique and test for proper assembly of the components with an accuracy of ± 0.05 mm. *[Different threads viz., metric/ BSW/ Square]*
6. Set the different machining parameters and cutters to prepare job by performing different milling operation and indexing. *[Different machining parameters – feed, speed and depth of cut. Different milling operations – plain, stepped, angular, dovetail, T-slot, contour, gear milling]*
7. Produce components of high accuracy by surface grinding operation.*[Accuracy of +/- 0.02 mm]*
8. Produce components of high accuracy by cylindrical grinding operations. *[Accuracy of +/- 0.02mm.]*
9. Sharpen different cutter or multipoint cutting tool. *[Different cutters – end mill cutter, side & face milling cutter, single angle cutter, Reamer]*
10. Develop isometric drawing and solid modelling of mould using CAD & Pro-E.

11. Set the welding plant with appropriate parameters & perform different welding operations. *[Appropriate parameter- electrode size, voltage, current, position, travel speed, torch angle.]*

SECOND YEAR:

12. Manufacturing of drill Jig and produce component on drill machine by using Jigs and check for correctness. (Simple template & Plate Jig)
13. Manufacturing of fixtures (milling, turning and grinding) & test.
14. Set (both job and tool) CNC turning centre and produce components as per drawing by preparing part programme.
15. Set (both job and tool) CNC machining centre vertical and produce components as per drawing by preparing part programme.
16. Perform 2D & 3D machining with CAM software.
17. Produce components using Electric Discharge Machine (EDM) and Wire EDM as per drawing by preparing part programme with accuracy of ± 0.02mm.
18. Manufacturing of blanking(simple) die set for square/ round/ rectangular/elliptical component and verify the component.
19. Construct a Piercing & Blanking tool & test and verify the component.
20. Construct circuit of pneumatics and hydraulics observing standard operating procedure and safety aspect.
21. Demonstrate function of basic electrical circuit and sensors.
22. Construct a Compound Tool & test and verify the component.
23. Construct a Progressive tool & test and verify the component.
24. Plan and perform simple repair, overhauling of different machines and check for functionality. [Different Machines – Drilling Machine, milling machine and Lathe]
25. Manufacture “V” bending tool & test.
26. Construct a draw tool (single stage) and test to verify the component.