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

COMPETENCY BASED CURRICULUM

OPERATOR ADVANCED MACHINE TOOL

(Duration: Two Years)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 5

SECTOR – CAPITAL GOODS AND MANUFACTURING

Directorate General of Training

OPERATOR ADVANCED MACHINE TOOL

(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-year 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 content broadly covers manufacturing of different components by operating different conventional and CNC machines. The broad components covered under Professional Skill subject are as below:

FIRST YEAR: - In this year, the contents covered are from safety aspect related to the trade, basic fitting operations viz., making, filing, sawing, chiseling, drilling, tapping, grinding and sheet metal work. The practical also involves producing components by different turning and milling operations along with basic maintenance of machines. The practical training, it starts with operation of grinding machine and broad information on different special machines is provided. Followed by different advanced turning and milling machines operation with extensive coverage of different operations & manufacturing components viz., taper turning, eccentric turning, boring, screw thread, multi start thread, gang milling, splines & different gears. Further inspections of components using different instruments & gauges and testing geometrical accuracy of machines are conducted.

SECOND YEAR: - In this year, all aspect of CNC turning covered starting from machine operations, programming and producing components on actual machine. The CNC milling operation is covered in all aspect of CNC milling covered starting from machine operations, programming and producing components on actual machine. Finally, different basic maintenance of machines is carried out so that trainees get acquainted with a different machine maintenance required in day to day operation.

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 – marking, Hack sawing, Chiselling, Filing, Drilling, Taping and Grinding etc. Accuracy: ± 0.25mm]
2. Plan & perform simple repair, maintenance of different machines and check for functionality. [Different Machines – Drill Machine, Power Saw and Bench Grinder]
3. 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, knurling.]
4. 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, face, angular, form, gang, straddle milling]
5. Produce components of high accuracy by different operations using grinding. [Different operations – surface grinding, cylindrical grinding with an accuracy of ± 0.01 mm]
6. Set different components of machine & parameters to produce taper/ angular components and ensure proper assembly of the components. [Different component of machine: Form tool, Compound slide, tail stock offset; Different machine parameters- Feed, speed, depth of cut.]
7. Set the different machining parameters to produce screw & multi start threaded components applying method/ technique and test for proper assembly of the components
8. Set the different machining parameters and cutters to prepare components by performing different milling operation and indexing. [Different machining parameters – feed, speed and depth of cut. Different components – Rack, Spur Gear, External Spline, bevel gear, Helical Gear, worm & work wheel.]
9. Measure components using different instrument/ gauge and test machine tool accuracy. [Different instrument/ gauges- limit gauges, Sine Bar, snip gauges, tool maker's microscope and profile projector; Simple Machines – Drill Machine, Power Saw and Lathe]

SECOND YEAR

10. Set (both job and tool) CNC turning centre and produce components as per drawing by preparing part programme.
11. Set (both job and tool) CNC machining centre and produce components as per drawing by preparing part programme.
12. Plan and perform simple repair and maintenance of different machines and check for functionality. [Different Machines – Drilling Machine, milling machine and Lathe]