



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

**COMPETENCY BASED CURRICULUM**

**CERTIFICATE COURSE ON**

# **ENGINEERING DRAWING**



**Applicable for all Engineering trades**

# ENGINEERING DRAWING

**Duration: 240 Hours**

**NSQF LEVEL- 4**  
**(Version: 1.0)**

**Designed in 2023**

**Developed By**

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

**&**

**CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE**

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## 1. COURSE INFORMATION

### 1.1 GENERAL

During the 240 hours duration of Engineering Drawing course, a candidate is trained on professional skills & knowledge related to job role. In addition to this a candidate is entrusted to undertake project work and extracurricular activities to build up confidence. The Broad components covered during the course are given below:

During the course, the trainee will learn about the emerging trends in drawing, construct engineering drawing and dimensions techniques using drawing instruments. Draw orthographic projection and isometric projection from orthographic views giving dimensions in same scale & reduced scale. Trainees will learn skills to draw and indicate the different types of sign and symbols used for fasteners, joints, fitting including electrical elements. Create 2D objects on CAD drawing space using commands from ribbon, menu bar, toolbars and by typing in command prompt.

### 1.2 PROGRESSION PATHWAYS

- Progression for this up-skilling programme will remain same as that of base trades for which this course is designed.
- Can join industry as Technician and will progress further as Senior Technician, Supervisor and can rise up to the level of Manager.
- Can become Entrepreneur in the related field.

### 1.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of 6 weeks: -

S No.	Course Element	Notional Training Hours
1.	Professional Skill (Trade Practical)	180
2.	Professional Knowledge (Trade Theory)	60
	<b>Total</b>	<b>240</b>

### 1.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of course through formative assessment and at the end of the training programme through summative assessment as notified by the DGT from time to time.

a) The Continuous Assessment (Internal) during the period of training will be done by Formative Assessment Method by testing for assessment criteria listed against learning outcomes. The training institute has to maintain an individual trainee portfolio as detailed in assessment guideline.

b) The pattern and marking structure is being notified by DGT from time to time. The learning outcome and assessment criteria will be the basis for setting question papers for final assessment.

c) Assessment will be evidence based comprising the following:

- Job carried out in labs/workshop/Field
- Answer sheet of assessment
- Viva-voce
- Participation and punctuality

Evidences of internal assessments are to be preserved until forthcoming Block examination for audit and verification by examining body.

d) The minimum pass percentage for skill test is 60%.

## 2. JOB ROLE

**Engineering Drawing;** This course is designed for Trainees to draft and prepare drawings of components and devices, produce draft design and diagrams according to the given specification. Trainees who interested in prepares drawings of machines, plant layout, mechanical components, equipment etc. from sketches, notes, data or sample for purposes of manufacture or repairs. Takes instructions from Engineer and calculates dimensions as required, from available materials (notes, data etc.) or sample. Draws to scale detailed drawings, assembly drawings, showing plan, elevations, sectional views etc. according to nature of work and operations required. Prints(writes)dimensions, tolerances, material to be used and other details to give clear picture and facilitate understanding. As on today create 2D objects on CAD drawing space using commands from ribbon, menu bar, toolbars in CAD application software.

**Draughtsperson, Mechanical;** prepares drawings of machines, plants, mechanical components, equipment, etc. from sketches, notes, data or sample for purposes of manufacture or repairs. Takes instructions from Mechanical Engineer and calculates dimensions as required, from available materials (notes, data etc.) or sample. Draws to scale detailed drawings, assembly drawings, showing plan, elevations, sectional views etc. according to nature of work and operations required. Prints (writes) dimensions, tolerances, material to be used and other details to gives clear picture and facilitate understanding. Maintains copies of drawings and makes blue prints. May trace drawings. May design simple mechanical parts. May prepare estimates for materials and labour required. May specialize in making drawings of jigs and tools and be designated accordingly.

**Draftsman;** is also called, 'Design Developer', the Draftsman makes/modifies electrical system drawings of control panels with application in various sectors. The individual at work develops electrical system drawings based on panel requirements of the customer, as communicated by the Design Engineer. This drawing is then verified by the Design Engineer and used by the production team in order to assemble the control panel

This course enables Trainee to understand in depth about the drawing. This ADD ON Courses includes drawing and drafting of mechanical component & equipments. After the completion of course Trainees becomes an Engineering Drawing specialist.

**Reference NCO-2015:**

3118.0401 – Draughts-person, Mechanical

3118.0301 - Draftsman

**Mapped NOS:**

- I. CSC/N9401
- II. PSS/9401
- III. G&J/N2307

### 3. GENERAL INFORMATION

<b>Name of the Trade</b>	<b>ENGINEERING DRAWING</b>	
<b>Trade Code</b>	DGT/8024	
<b>Reference NCO - 2015</b>	3118.0301, 3118.0401	
<b>NOS Covered</b>	CSC/N9401, PSS/9401, G&J/N2307	
<b>NSQF Level</b>	Level 4	
<b>Duration of Craftsmen Training</b>	240 Hours	
<b>Entry Qualification</b>	Passed 10th Class Examination with completion of initial 1200 hrs. of CTS training in any engineering trade.	
<b>Unit Strength (No. of Student)</b>	20	
<b>Space Norms</b>	64 Sq. m	
<b>Power Norms</b>	3.7 KW	
<b>Instructors Qualification</b>	<p>B.Voc/Degree in Engineering from AICTE/UGC recognized Engineering College/University with one year Experience in the relevant field.</p> <p style="text-align: center;"><b>OR</b></p> <p>03 years Diploma in Engineering from AICTE/ recognized Board of Technical Education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field.</p> <p style="text-align: center;"><b>OR</b></p> <p>NTC/ NAC in any one of the relevant engineering group of trades categorized under Engineering Drawing / D'man (Mech. / Civil) with three years' experience.</p> <p><b>Essential Qualification:</b> National Craft Instructor Certificate(NCIC)in relevant trade</p> <p style="text-align: center;"><b>OR</b></p> <p>NCIC in RoDA/D'man (Mech./Civil)or any of its variants under DGT.</p>	
<b>List of Tools and Equipment</b>	As per Annexure – I	
<b>Distribution of training on hourly basis: (Indicative only)</b>		
<b>Total hours/ Week</b>	<b>Trade practical</b>	<b>Trade theory</b>
40	30	10

## 4. LEARNING OUTCOME

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

### 4.1 LEARNING OUTCOMES

1. Construct free hand sketches of simple tools and fastener with correct proportions. (Mapped NOS:CSC/N9401)
2. Construct engineering drawing using drawing instruments. (Mapped NOS: CSC/N9401)
3. Construct different Geometrical figures using drawing Instruments. (Mapped NOS: CSC/N9401)
4. Construct lettering and numbering. (Mapped NOS: CSC/N9401)
5. Indicate the dimensions and text on the geometrical figures as per convention. (Mapped NOS: CSC/N9401)
6. Construct the layout of drawing sheet as per SP:46-2003. (Mapped NOS: CSC/N9401)
7. Draw orthographic Projections and draw isometric projection from orthographic views (and vice-versa) giving proper dimensioning. (Mapped NOS:CSC/N9401)
8. Draw and indicate the different types of sign and symbols used for fasteners, joints, fittings and electrical elements as per SP46:2003. (Mapped NOS:CSC/N9401, PSS/9401)
9. Create 2D objects on CAD drawing space using commands from ribbon, menu bar, toolbars and by typing in command prompt. (Mapped NOS: G&J/N2307)
10. Construct projection views of geometrical figures with dimension and annotation on CAD in different layers. (Mapped NOS: G&J/N2307)
11. Construction orthographic sectional view of machine blocks with dimension and annotation on CAD in model space and viewport in layout space and save for print. (Mapped NOS: G&J/N2307)



SYLLABUS – ENGINEERING DRAWING			
Duration: 240 Hours			
Duration Weeks	Reference Learning outcome	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
Professional Skills 15 Hrs.  Professional knowledge 05 Hrs.	Construct free hand sketches of simple tools and fastener with correct proportions. (Mapped NOS: CSC/N9401)	<b>Freehand drawing of–</b> <ol style="list-style-type: none"> <li>1. Lines, polygons, ellipse etc.</li> <li>2. Geometrical figures and blocks with dimension</li> <li>3. Transferring measurement from the given object to the free hand sketches.</li> <li>4. Solid objects–Cube, Cuboids, Cone, Prism, Pyramid, Frustum of Cone with dimensions.</li> <li>5. Hand tools and measuring tools used in common trades.</li> <li>6. Simple fasteners bolts, nuts, rivets, screw thread, different types of locking devices (e.g. Double nut, Castle nut, Pin, etc.)</li> <li>7. Different types of Keys, splined shaft, circlips and pins as per convention.</li> </ol>	<b>Introduction:</b> <ul style="list-style-type: none"> <li>• Introduction to engineering drawing Conventions</li> <li>• Views of engineering drawing sheets</li> <li>• Method of folding of printed drawing sheets as per BIS SP: 46-2003</li> </ul> <b>Drawing Instrument :</b> <ul style="list-style-type: none"> <li>• Drawing board, T-square, Drafter (Drafting M/c), Set squares, Protector, Drawing Instrument Box (Compass, Dividers, Scale, Diagonal Scales etc.), pencils of different grades, Drawing pins/ Clips.</li> </ul>
Professional Skills 05 Hrs.  Professional knowledge 02 Hrs.	Construct engineering drawing using drawing instruments. (Mapped NOS: CSC/N9401)	<b>Perform assignment using drawing instruments::</b> <ol style="list-style-type: none"> <li>8. Draw different types of lines as per SP: 46-2003</li> <li>9. Draw lines of given length (straight, curved), drawing of parallel lines, perpendicular line and methods of division of line segment.</li> </ol>	<ul style="list-style-type: none"> <li>• Nomenclature, description and use of drawing instruments &amp; various equipment, their care and maintenance.</li> <li>• Lines - Definition, types and applications in drawing as per BIS: 46-2003 and classification of lines</li> <li>• Lines - Drawing lines (straight, curved),</li> </ul>

			drawing of parallel lines, perpendicular line and methods of division of line segment
Professional Skills 14 Hrs.  Professional knowledge 03 Hrs.	Construct different Geometrical figures using drawing Instruments. (Mapped NOS: CSC/N9401)	<b>Drawing of Geometrical figures:</b> 10. Draw geometrical figures - angle, measurement and draw different types of angle and triangles 11. Draw bisecting practice of angles and triangles 12. Draw Square, rectangle, rhombus, parallelogram, circle and its elements 13. Draw different polygons and measure their included angles. Inscribed and circumscribed polygons	<ul style="list-style-type: none"> <li>• Definition, nomenclature of angles and measurement and types of angle and triangle</li> <li>• Definition, nomenclature of Square, rectangle, polygons, rhombus, parallelogram, circle and its elements</li> </ul>
Professional Skills 04 Hrs.  Professional knowledge 01 Hrs.	Construct lettering and numbering (Mapped NOS: CSC/N9401)	14. Lettering and numbering – write Block letters & numerals in single, double stroke and inclined of ratio 7:4 and 5:4 in drawing sheet.	<ul style="list-style-type: none"> <li>• Type of lettering proportion and spacing of letters and words.</li> </ul>
Professional Skills 05 Hrs.  Professional knowledge 02 Hrs.	Indicate the dimensions and text on the geometrical figures as per convention. (Mapped NOS: CSC/N9401)	<b>Dimensioning and its Practice</b> 15. Dimensioning and its practice - Methods of dimensions and position of dimensioning (aligned, unidirectional) 16. Creating Symbols preceding the value of dimension and dimensional tolerance.	<ul style="list-style-type: none"> <li>• Dimensioning - Definition, and its types, types of arrow heads and leader line with text</li> <li>• Basic idea of scales</li> </ul>
Professional Skills 04 Hrs.  Professional knowledge 02 Hrs.	Construct the layout of drawing sheet as per SP:46-2003 (Mapped NOS: CSC/N9401)	<b>Sizes and layout of drawing sheets :</b> 17. Layout a A3 drawing sheet as per SP -46: 2003 with margin and name plate. 18. Draw a sample title block providing details as:	<ul style="list-style-type: none"> <li>• Lay out and designation of a drawing sheet as per Sp - 46 :2003</li> <li>• Recommended scale of engineering drawing as per Sp-46 : 2003</li> <li>• Types of Lines and their</li> </ul>

		<p>(i) Title of the drawing  (ii) Sheet number  (iii) Scale  (iv) Symbol, denoting the method of projection  (v) Revision with sign  (vi) Name of the firm  (vii) Initials of staff drawn, checked and approved.</p>	<p>application.</p> <ul style="list-style-type: none"> <li>Folding of prints for filing Cabinets or binding as per SP:46-2003.</li> </ul>
<p>Professional Skills 30 Hrs.  Professional knowledge 10 Hrs.</p>	<p>Draw orthographic Projections and draw isometric projection from orthographic views (and vice-versa) giving proper dimensioning (Mapped NOS: CSC/N9401)</p>	<p>19. Draw orthographic projection of points and lines.  20. Draw projection of plane figures (lamina)  21. Draw Orthographic drawing of solids (viz., cube, prisms, cone and pyramids) finding out the true shape surfaces cut by oblique planes.  22. Draw orthographic sectional view of solid objects.  23. Construct the isometric view of Polygons and circular lamina.  24. Draw isometric view of solid geometrical figures from orthographic views with dimension.</p>	<ul style="list-style-type: none"> <li>Methods of obtaining orthographic view. Position of the object, selection of the views, three views of drawing. Planes and their normal projections.</li> <li>Method of 1st angle and 3rd angle projections</li> <li>Symbol of 1st angle and 3rd angle projection as per IS specification</li> <li>Principle of isometric projection and Isometric drawing. Methods of isometric projection and dimensioning. Isometric scale. Difference between Isometric drawing &amp; Isometric projection.</li> </ul>
<p>Professional Skills 08 Hrs.  Professional knowledge 03 Hrs.</p>	<p>Draw and indicate the different types of sign and symbols used for fasteners, joints, fittings and electrical elements as per SP46:2003 (Mapped NOS: CSC/N9401, PSS/9401)</p>	<p>25. Sketch Conventional signs and symbols in the trades - Fastener (bolts, nuts and rivets), bars and profile sections, weld, brazed and soldered joints, electrical and electronic elements, piping joints and fittings.  26. Sketch different types of section lines and abbreviations for different materials as per SP-</p>	<ul style="list-style-type: none"> <li>Conventional signs, symbols, abbreviations &amp; hatching for different materials.</li> <li>Electrical and electronic circuits.</li> </ul>

		46:2003. 27. Draw simple electrical & electronic circuits.	
<b>Drawing in AutoCAD</b>			
Professional Skills 37 Hrs.  Professional knowledge 14 Hrs.	Create 2D objects on CAD drawing space using commands from ribbon, menu bar, toolbars and by typing in command prompt. (Mapped NOS: G&J/N2307)	<p><b>Perform application in CAD:</b></p> <p>28. Open file from Start-up palette.</p> <p>29. Change the Workspace dropdown menu in CAD screen and follow the ribbon and toolbar settings.</p> <p>30. Locate origin and the graphical limit of drawing space from co-ordinate display.</p> <p>31. Use of drafting setting and display commands.</p> <p>32. Use buttons of mouse for pan, zoom in and zoom out.</p> <p>33. Use functional keys to access certain commands.</p> <p>34. Use commands from icons in the ribbon, from menu bar and from floating toolbar.</p> <p>35. Drag and drop figures from tool palettes.</p> <p>36. Type the command at the command prompt and invoke.</p> <p>37. Open existing drawings</p> <p>38. Create of drawing Sheet layout</p> <p>39. Open drawing sheet layout from template.</p>	<ul style="list-style-type: none"> <li>• Introduction to CAD Advantages of using CAD, CAD main Menu, screen menu, command line, model space and layout space.</li> <li>• Drawing layouts, Tool bars, File creation, Save, Open existing drawings, creation of Drawing Sheet as per ISO.</li> </ul>
Professional Skills 33 Hrs.	Construct projection views of geometrical figures with dimension and	40. Create 2D objects using Absolute Co-ordinate system, Polar Co-ordinate System and Relative Co-	<ul style="list-style-type: none"> <li>• Absolute Co-ordinate system, Polar Co-ordinate System and Relative Co-ordinate System, Create</li> </ul>

<p>Professional knowledge 10 Hrs.</p>	<p>annotation on CAD indifferent layers (Mapped NOS: G&amp;J/N2307)</p>	<p>ordinate System. 41. Draw 2D object using line, polyline, ray, polygon, circle, rectangle, arc, ellipse commands. 42. Modify 2D objects using Break, Erase, Trim, Offset, Fillet, Chamfer Commands. 43. Manage 2D objects using Move, Copy, Array, Insert Block, Make Block, Scale, Rotate, Hatch Commands.</p>	<p>Line, Break, Erase, Undo.</p> <ul style="list-style-type: none"> <li>• Drawing of Line, polyline, ray, polygon, circle, rectangle, arc, ellipse using different options.</li> <li>• Trim, Offset, Fillet, Chamfer, Arc and Circle under modify commands.</li> <li>• Move, Copy, Array, Insert Block, Make Block, Scale, Rotate, Hatch Commands.</li> </ul>
		<p>44. Create templates, Insert drawings. Create objects in different Layers and Modify Layer properties. 45. Make layer visible or hide. 46. Provide dimension on object. 47. Create dimension by customizing dimension styles (lines, arrows, text, unit and alignment) 48. Put dimension with scale factor.</p>	<ul style="list-style-type: none"> <li>• Creating templates, Inserting drawings, Layers, Modify Layers.</li> <li>• Format dimension style, creating new dimension style, modifying styles in dimensioning.</li> <li>• Writing text on dimension line and on leader.</li> <li>• Edit text dimension</li> </ul>
<p>Professional Skills 25 Hrs.  Professional knowledge 08 Hrs.</p>	<p>Construction orthographic sectional view of machine blocks with dimension and annotation on CAD in model space and view port in layout space and save for print. (Mapped NOS: G&amp;J/N2307)</p>	<p>49. Construct orthographic sectional view of a steel bracket with dimension using shortcut keyboard command. 50. Construct isometric view of simple machine block. 51. Construct detailed drawing of two mating blocks. 52. Construct drawing of simple work holding device 53. Create view ports in layout</p>	<ul style="list-style-type: none"> <li>• Knowledge of short cut keyboard command.</li> <li>• Customization of key board command.</li> <li>• Customization of drafting settings, changing orthographic snap to isometric snap.</li> <li>• Procedure to create viewport in layout space in zooming scale.</li> <li>• Exporting of drawings to</li> </ul>

		space and place views for model space indifferent scale.	other sources
		54. Create, save and print a document, worksheet and pdf (portable document format)files.	<ul style="list-style-type: none"><li>• Save, Open existing drawings, creation of Drawing Sheet.</li></ul>
<b>Examination</b>			

## 6. ASSESSMENT CRITERIA

LEARNING OUTCOME	ASSESSMENT CRITERIA
1. Construct free hand sketches of simple tools and fastener with correct proportions. (Mapped NOS: CSC/N9401)	Maintain hand movement to draw straight lines and curved lines.
	Sketch geometrical figures of lamina and blocks with correct proportions.
	Indicate dimensions on the geometrical figures.
	Sketch hand tools, fasteners and different types of locking devices maintaining correct proportions.
2. Construct engineering drawing using drawing instruments. (Mapped NOS: CSC/N9401)	Perform assignment using drawing instruments.
	Draw different types of lines as per SP:46-2003
	Draw straight lines, curved lines, parallel lines and perpendicular lines.
	Draw line segment of given length
	Draw angles with different methods and measured the dimensions.
3. Construct different Geometrical figures using drawing Instruments. (Mapped NOS: CSC/N9401)	Draw triangles, polygons, circles, parallelogram, angle bisector and line bi-sector.
	Construct regular polygons (up to 8 sides) on equal base.
	Layout a A3 drawing sheet as per Sp -46 : 2003 with margin and name plate.
	Fold a sheet of A0 size for filing Cabinets or binding as per SP: 46 - 2003.
	Label a drawing view showing the types of line are used.
	Construct ellipse, parabola & hyperbola.
	Construct involutes, cycloid curves, helix & spiral.
4. Construct lettering and numbering. (Mapped NOS: CSC/N9401)	Write block letters & numerals in single & double stroke.
	Write name of the drawing title on heading at centre alignment in double stroke 5:4 block letter.
	Draw a sample title block as used in industry.
5. Indicate the dimensions and text on the geometrical figures as per convention. (Mapped NOS: CSC/N9401)	Provide dimensions on the geometrical figures as per SP:46-2003
	Write text and symbols preceding the value of dimension.
	Label a drawing views showing the types of line are used.
	Construct object drawing with dimensioning in different alignment as per SP-46.

6. Construct the layout of drawing sheet as per SP:46-2003 (Mapped NOS: CSC/N9401)	Layout a A3 drawing sheet as per SP -46 : 2003 with margin and name plate.
	Draw a sample title block providing details as used in the industry.
7. Draw orthographic Projections and draw isometric projection from orthographic views (and vice-versa) giving proper dimensioning (Mapped NOS: CSC/N9401)	Generate views in orthographic projection by placing object between horizontal and vertical plane of axes.
	Generate side view of laminar objects in different inclination on VP and HP by auxiliary vertical plane.
	Draw orthographic projection of points, lines and plain laminar figures.
	Draw orthographic projection of solids viz. prism, cones, pyramids and their frustums in 1st angle and 3rd angle method.
	Draw the isometric projection of regular solids from orthographic views.
	Draw the isometric views for the given solids with hollow and cut sections.
	Draw the orthographic views of geometrical solids from their isometric view.
	Construct dimensions on the isometric view of solids.
8. Draw and indicate the different types of sign and symbols used for fasteners, joints, fittings and electrical elements as per SP46:2003 (Mapped NOS:CSC/N9401, PSS/9401)	Generate views in orthographic projection by placing object between horizontal and vertical plane of axes.
	Generate side view of laminar objects in different inclination on VP and HP by auxiliary vertical plane.
	Draw orthographic projection of points, lines and plain laminar figures.
	Draw orthographic projection of solids viz. prism, cones, pyramids and their frustums in 1st angle and 3rd angle method.
	Draw the isometric projection of regular solids from orthographic views.
	Draw different Screw threads with SP-46:2003conventions.
	Draw riveted joints giving rivet arrangement symbols.
	Draw welded joints giving welding symbols in welded structures.
	Draw symbols of different types of pipe fittings and pipe joints (flanged, welded, threaded, socket and spigot).
	Sketch Conventional signs and symbols for steel section.
	Sketch different types of section lines and abbreviations for different materials as per SP-46:2003.



	Sketch Conventional signs and symbols of electrical and electronic elements.
9. Create 2D objects on CAD drawing space using commands from ribbon, menu bar, toolbars and by typing in command prompt. (Mapped NOS:G&J/N2307)	Perform file management in Windows operating system.
	Create, save and print a document, worksheet and pdf file.
	Start drawing in CAD from: new, template wizard and existing drawing file.
	Select Drawing limit of the CAD drawing space.
	Select proper setting of ribbon and toolbars, choice of workspace, scale.
	Draw object in CAD drawing space using commands from icons in the ribbon, from menu bar, from floating toolbar and by typing command at the command prompt.
	Use functional keys to access certain commands.
10. Construct projection views of geometrical figures with dimension and annotation on CAD in different layers (Mapped NOS: G&J/N2307)	Draw object CAD drawing space using line, polyline, polygon, circle, rectangle, arc, ellipse commands.
	Modify object using Break, Erase, Trim, Offset, Fillet, Chamfer, Commands.
	Manage object using Move, Copy, Array, Insert Block, Make Block, Scale, Rotate, Hatch Commands.
	Create templates, Insert drawings, Layers, Modify Layer properties.
	Provide dimension, annotation on object and customize different Dimension and Text styles.
	Construct orthographic drawing using shortcut keyboard command.
	Construct isometric drawing of machine blocks.
	Put dimension with scale factor.
11. Construction orthographic sectional view of machine blocks with dimension and annotation on CAD in model space and viewport in layout space and save for print. (Mapped NOS: G&J/N2307)	Draw orthographic sectional view of a steel bracket with dimension.
	Construct isometric view of simple machine block.
	Construct detailed drawing of two mating blocks.
	Create orthographic view of simple work holding device.
	Arrange the drawing in two and three viewports in layout space.
	Create, save and print a document, worksheet and convert the drawing file into pdf (portable document format)file.

LIST OF TOOLS & EQUIPMENT			
ENGINEERING DRAWING			
S No.	Name of the Tools and Equipment	Specification	Quantity
<b>A:TRAINEESTOOL KIT:</b>			
1.	Drawing instrument box	Containing- Compass with pencilpoint, divider, protractor,scale, etc.	01 set per trainee
2.	Setsquare celluloid 45°	250 x 1.5mm	01 no. per trainee
3.	Setsquare celluloid 30°-60°	250 x 1.5mm	01no.per trainee
4.	French-curves(setof12 celluloid)		4sets.
5.	T-Square or Mini drafter	750mm	01no.per trainee
6.	Drawing board IS:1444	700mm x 500mm	01no.per trainee
7.	Almirah steel	As required	As required
<b>B: GENERAL MACHINERY &amp; SHOP OUTFIT :</b>			
8.	Draughtsman table		20 nos.
9.	Draughtsman stool		20 nos.
10.	Desktop Computer, for running AutoCAD software (Latest Version), preloaded with windows operating system.	latest processor, higher speed, higher RAM, Wi-Fi Enabled. Network Card with USB Mouse, USB Keyboard and Monitor (Min. 17 Inch.) Licensed Operating System and Antivirus compatible	20+1 nos.
11.	Software: MS- office latest version, AutoCAD with latest Licensed version (Free downloadable),		20+1 users
12.	Laser Jet printer latest model		1 no.
13.	UPS		As required
14.	Instructor Table		1 no.
15.	Instructor Chair		2 nos.
16.	Computer table		20+1 nos.
17.	Computer chairs		20+1 nos.
18.	External storage device (8 GB)		2 nos.
19.	White Board for using LCD projector(optional)		1 no.
20.	Almirah (steel)		1 no.

## ANNEXURE-II

The DGT sincerely acknowledges contributions of the Industries, State Directorates, Trade Experts, Domain Experts and all others who contributed in designing/ revising the curriculum. Special acknowledgement is extended by DGT to the following expert members who had contributed immensely in this curriculum.

<b>Trade committee meeting to finalize the syllabus of “Employability Skills (2<sup>nd</sup> Year) Module and Engineering Drawing (240 hrs.) held on 14<sup>th</sup> March, 2023 at CSTARI, Conference Room.</b>			
<b>Sl. No.</b>	<b>Name and Designation (Shri/Smt./Kumari)</b>	<b>Organization with Address</b>	<b>Remarks</b>
1.	Sunil Kumar Gupta, DDG	CSTARI, Kolkata	Chairman
2.	N.R. Aravindan, Director	CSTARI, Kolkata	Member
3.	Sanjay Kumar, Director	DGT, MSDE, New Delhi	Member
4.	Sanjay Nath, Founder	Trishna Welfare Trust, RBC Road, Rishra	Member
5.	Juthika Roy (Chakraborty), Instructor	ITI, Gariahat	Member
6.	Tanumay Ghosh, Instructor	ITI, Gariahat	Member
7.	M. Sangara Pondian, Training Officer (Retd.)	NIMI, Chennai	Member
8.	V.Gopalakrishnan, Manager	NIMI, Chennai	Member
9.	Rupen Kr. Saha	NSTI Kolkata (Howrah)	Member
10.	Utpal Banerjee, Project Head	Adwik Security, Ballygunge, Kolkata	Member
11.	Shubhra Gupta, Vice President	Medha	Member
12.	Preety Thapa, Asst. Vice President	Medha	Member
13.	Kotresh HB	Quest Alliance	Member
14.	Soumitra De	Surya Engg. Pvt. Ltd, Kolkata	Member
15.	Sushmitha Sridhara	Quest Alliance	Member
16.	Soorya Menon	Quest Alliance	Member
17.	Ankita Dhyami	Quest Alliance	Member
18.	Badal Chandra Das, Director	JSS RK Mission Ashram, Narendrapur	Member
19.	Parthasarathi Roy, Instructor	Women ITI, Kolkata	Member
20.	Narottam Roy, Director	JSS, Howrah	Member
21.	Partha P. Ganguly,	RK Mission, Belur Math	Member

	Teacher		
22.	Sharif Balaji, Technical Partner	BFSI SSC, Mumbai	Member
23.	Balaji S. Technical Partner	BFSI SSC, Mumbai	Member
24.	Angshuman Chatterjee, Proprietor	Classic International, Kolkata	Member
25.	Satyajeet Shrikant, Date	Hindustan Aeronautics	Member
26.	Ramesh Sarkar, Ex Chairman	JSS-(N) 24 Parganas	Member
27.	Shibani Biswas, Chief Coordinator	JSS-(N) 24 Parganas	Member
28.	Shibasis Sen, Engineer	EETPC India, Kolkata	Member
29.	Mousumi Lahiri, Faculty	ITI, Howrah Homes, Howrah	Member
30.	Sudip Ranjan Ghosh, Instructor	ITI, Howrah Homes, Howrah	Member
31.	Snehasish Bandyopadhyay, AD	DGT, MSDE, New Delhi	Member
32.	Subir Ray, Director	D.Kapur CPS Lab	Member
33.	Suman Kumar,	NIESBUD	Member
34.	Vijay Kumar Assistant Director	CSTARI, Kolkata	Expert
35.	Tapan Haldar Training Officer	NSTI Howrah	Expert
36.	Rupen Kumar Saha Training Officer	NSTI Howrah	Expert
37.	Samir Sarkar Assistant Director	CSTARI, Kolkata	Expert
38.	Prasoon Kumar Ghosh Ex-Sr. D/Man	CSTARI, Kolkata	Expert
39.	B. Sharanappa, AD	CSTARI, Kolkata	Member
40.	Sk. Altaf Hossain, AD	CSTARI, Kolkata	Member
41.	A. Pandey, AD	CSTARI, Kolkata	Member
42.	Bhagat Singh, AD	CSTARI, Kolkata	Member
43.	M.J. Vijay Raju, AD	CSTARI, Kolkata	Member
44.	PK Bairagi, TO	CSTARI, Kolkata	Member
45.	BK Nigam, TO	CSTARI, Kolkata	Member
46.	KVS Narayana, TO	CSTARI, Kolkata	Member
47.	Hemant Kujur, Jr. D/Man	CSTARI, Kolkata	Member
48.	B. Biswas, Jr. D/Man	CSTARI, Kolkata	Member