Qualification Pack

Draughtsman Mechanical

QP Code: CSC/Q0402

Version: 4.0

NSQF Level: 4

Capital Goods & Strategic Skill Council || 1st Floor, L-29, Outer Circle, Connaught Place
New Delhi – 110001 || email:technicaladvisors@cgsc.in

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CSC/Q0402: Draughtsman Mechanical

Brief Job Description

A Draughtsman Mechanical is responsible for developing 3D drawings of design specifications for mechanical equipment and components. The individual selects and uses the appropriate Computer-Aided Design (CAD) software and equipment for the purpose, depending on the type and complexity of the drawing functions to be carried out. The person collaborates with engineers, production technicians and clients to identify design problems and develop effective solutions.

Personal Attributes

The individual must have attention to detail, along with excellent numerical, computational and problem-solving skills. The person must be good at both oral and written communication. The individual must also be able to work in coordination with others to achieve the work objectives.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [CSC/N1335: Follow the health and safety practices at the work](#)

2. [CSC/N1336: Coordinate with co-workers to achieve work efficiency](#)

3. [CSC/N0402: Create and modify 3D mechanical engineering drawings using the CAD system](#)

4. [DGT/VSQ/N0101: Employability Skills (30 Hours)](#)

Qualification Pack (QP) Parameters

Sector	Capital Goods
Sub-Sector	Machine Tools
Occupation	Design
Country	India
NSQF Level	4
Credits	15
Aligned to NCO/ISCO/ISIC Code	NCO-2015/NIL

Minimum Educational Qualification & Experience	Completed 2nd year of the 3-year diploma after 10 (or equivalent) OR 10th grade pass with 1 year NTC plus NAC (or equivalent) OR 10th Class with 3 Years of experience relevant OR 11th grade pass with 1.5 years of experience relevant OR Previous relevant Qualification of NSQF Level (3.5) with 1.5 years of experience relevant OR Previous relevant Qualification of NSQF Level (3) with 3 Years of experience relevant
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	NA
Next Review Date	30/04/2028
NSQC Approval Date	08/05/2025
Version	4.0
Reference code on NQR	QG-04-CG-03930-2025-V2-CGSSC
NQR Version	4.0

CSC/N1335: Follow the health and safety practices at the work

Description

This OS unit is about following the appropriate health and safety practices at work. It covers responsibilities towards self and others to ensure a safe work environment.

Scope

The scope covers the following :

- Maintain personal health and safety
- Assist in hazard management
- Check the first aid box, firefighting and safety equipment
- Assist in waste management
- Follow the fire safety guidelines
- Follow the emergency and first-aid procedures
- Carry out relevant documentation and review

Elements and Performance Criteria

Maintain personal health and safety

To be competent, the user/individual on the job must be able to:

PC1. follow the recommended practices to ensure protection from infections and transmission to others, such as the use of hand sanitiser and face mask

PC2. check the work conditions, assess the potential health and safety risks, and take appropriate measures to mitigate them

PC3. select and use the appropriate Personal Protective Equipment (PPE) relevant to the task and work conditions

PC4. follow the recommended techniques while lifting and moving heavy objects to avoid injury

PC5. follow the manufacturer's instructions and workplace safety guidelines while working on heavy machinery, tools and equipment

Assist in hazard management

To be competent, the user/individual on the job must be able to:

PC6. identify existing and potential hazards at work

PC7. assess the potential risks and injuries associated with the identified hazards

PC8. coordinate with the supervisor or other relevant personnel to prevent or minimise the identified hazards

PC9. handle hazardous materials safely and store them in the designated storage

Check the first aid box, firefighting and safety equipment

To be competent, the user/individual on the job must be able to:

PC10. check the first aid box to ensure it is updated with the relevant first aid supplies

PC11. check and test the firefighting and various safety equipment to ensure they are in usable condition

PC12. coordinate with the supervisor for the repair and replacement of firefighting and safety equipment

Assist in waste management

To be competent, the user/individual on the job must be able to:

PC13. segregate waste into appropriate categories

PC14. recycle the recyclable waste appropriately

PC15. dispose of the non-recyclable waste in an environment-friendly manner, complying with the applicable regulations

Follow the fire safety guidelines

To be competent, the user/individual on the job must be able to:

PC16. use the appropriate type of fire extinguisher to extinguish different types of fires safely

PC17. follow the recommended practices for a safe rescue during a fire emergency

PC18. coordinate with the fire department to request assistance to extinguish a serious fire

Follow the emergency and first-aid procedures

To be competent, the user/individual on the job must be able to:

PC19. follow the organisational health and safety guidelines during workplace emergencies to ensure own and co-workers' safety

PC20. follow the recommended practices to minimise loss to organisational property during an emergency

PC21. follow the recommended procedure to free a person from electrocution

PC22. administer appropriate first aid to the injured personnel

PC23. perform Cardiopulmonary Resuscitation (CPR) on a potential victim of cardiac arrest

PC24. coordinate with the emergency services to request medical assistance for seriously injured/ ill personnel requiring professional medical attention or hospitalisation

Carry out relevant documentation and review

To be competent, the user/individual on the job must be able to:

PC25. carry out appropriate documentation following a health and safety incident at work, including all the required information

PC26. coordinate with the relevant personnel to review health and safety conditions at work regularly or following an incident

PC27. assist in implementing appropriate changes to improve the health and safety conditions at work

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the recommended practices to be followed to ensure protection from infections and transmission to others, such as the use of hand sanitiser and face mask

KU2. the importance and process of checking the work conditions, assessing the potential health and safety risks, and take appropriate measures to mitigate them

KU3. the importance and process of selecting and using the appropriate PPE relevant to the task and work conditions

KU4. the recommended techniques to be followed while lifting and moving heavy objects to avoid injury

KU5. the importance of following the manufacturer's instructions and workplace safety guidelines while working on heavy machinery, tools and equipment

KU6. the importance and process of identifying existing and potential hazards at work

KU7. the process of assessing the potential risks and injuries associated with the various hazards

KU8. how to prevent or minimise different types of hazards

KU9. how to handle and store hazardous materials safely

KU10. the importance of ensuring the first aid box is updated with the relevant first aid supplies

KU11. the process of checking and testing the firefighting and various safety equipment to ensure they are in a usable condition

KU12. the criteria for segregating waste into appropriate categories

KU13. the appropriate methods for recycling the recyclable waste

KU14. the process of disposing of the non-recyclable waste safely and the applicable regulations

KU15. Use of different types of fire extinguishers to extinguish different types of fires

KU16. the recommended practices to be followed for a safe rescue during a fire emergency

KU17. how to request assistance from the fire department to extinguish a serious fire

KU18. the appropriate practices to be followed during workplace emergencies to ensure safety and minimise loss to organisational property

KU19. common health and safety hazards present in a work environment, associated risks, and how to mitigate them

KU20. safe working practices to be followed while working at various hazardous sites and using electrical equipment

KU21. the importance of ensuring easy access to firefighting and safety equipment

KU22. the appropriate preventative and remedial actions to be taken in the case of exposure to toxic materials, such as poisonous chemicals and gases

KU23. various causes of fire in different work environments and the recommended precautions to be taken to prevent fire accidents

KU24. different methods of extinguishing fire

KU25. different materials used for extinguishing fire, such as sand, water, foam, CO_2, dry powder, etc.

KU26. the applicable rescue techniques to be followed during a fire emergency

KU27. the importance of placing safety signs and instructions at strategic locations in a workplace and following them

KU28. different types of first aid treatment to be provided for different types of injuries

KU29. potential injuries associated with incorrect manual handling

KU30. how to move an injured person safely

KU31. various hazards associated with the use of various machinery, tools, implements, equipment and materials

KU32. the importance of ensuring no obstruction and free access to fire exits

KU33. how to free a person from electrocution safely

KU34. how to administer appropriate first aid to an injured person

KU35. how to perform Cardiopulmonary Resuscitation (CPR)

KU36. the importance of coordinating with the emergency services to request urgent medical assistance for persons requiring professional medical attention or hospitalisation

KU37. the appropriate documentation to be carried out following a health and safety incident at work, and the relevant information to be included

KU38. the importance and process of reviewing the health and safety conditions at work regularly or following an incident

KU39. the importance and process of implementing appropriate changes to improve the health and safety conditions at work

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. maintain work-related notes and records

GS2. communicate clearly and politely with co-workers and clients

GS3. read the relevant literature to get the latest updates about the field of work

GS4. listen attentively to understand the information being shared

GS5. plan and prioritise tasks to ensure timely completion

GS6. take quick decisions to deal with workplace emergencies and accidents

GS7. identify possible disruptions to work and take appropriate preventive measures

GS8. coordinate with the co-workers to achieve the work objectives

GS9. evaluate all possible solutions to a problem to select the best one

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Maintain personal health and safety	**7**	**12**	**-**	**-**
PC1. follow the recommended practices to ensure protection from infections and transmission to others, such as the use of hand sanitiser and face mask	2	3	-	-
PC2. check the work conditions, assess the potential health and safety risks, and take appropriate measures to mitigate them	1	2	-	-
PC3. select and use the appropriate Personal Protective Equipment (PPE) relevant to the task and work conditions	1	2	-	-
PC4. follow the recommended techniques while lifting and moving heavy objects to avoid injury	1	3	-	-
PC5. follow the manufacturer's instructions and workplace safety guidelines while working on heavy machinery, tools and equipment	2	2	-	-
Assist in hazard management	**4**	**10**	**-**	**-**
PC6. identify existing and potential hazards at work	1	1	-	-
PC7. assess the potential risks and injuries associated with the identified hazards	1	3	-	-
PC8. coordinate with the supervisor or other relevant personnel to prevent or minimise the identified hazards	1	3	-	-
PC9. handle hazardous materials safely and store them in the designated storage	1	3	-	-
Check the first aid box, firefighting and safety equipment	**3**	**7**	**-**	**-**
PC10. check the first aid box to ensure it is updated with the relevant first aid supplies	1	2	-	-
PC11. check and test the firefighting and various safety equipment to ensure they are in usable condition	1	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. coordinate with the supervisor for the repair and replacement of firefighting and safety equipment	1	2	-	-
Assist in waste management	**3**	**8**	**-**	**-**
PC13. segregate waste into appropriate categories	1	3	-	-
PC14. recycle the recyclable waste appropriately	1	3	-	-
PC15. dispose of the non-recyclable waste in an environment-friendly manner, complying with the applicable regulations	1	2	-	-
Follow the fire safety guidelines	**3**	**12**	**-**	**-**
PC16. use the appropriate type of fire extinguisher to extinguish different types of fires safely	1	4	-	-
PC17. follow the recommended practices for a safe rescue during a fire emergency	1	4	-	-
PC18. coordinate with the fire department to request assistance to extinguish a serious fire	1	4	-	-
Follow the emergency and first-aid procedures	**7**	**12**	**-**	**-**
PC19. follow the organisational health and safety guidelines during workplace emergencies to ensure own and co-workers' safety	1	2	-	-
PC20. follow the recommended practices to minimise loss to organisational property during an emergency	1	3	-	-
PC21. follow the recommended procedure to free a person from electrocution	1	2	-	-
PC22. administer appropriate first aid to the injured personnel	1	2	-	-
PC23. perform Cardiopulmonary Resuscitation (CPR) on a potential victim of cardiac arrest	1	2	-	-
PC24. coordinate with the emergency services to request medical assistance for seriously injured/ ill personnel requiring professional medical attention or hospitalisation	2	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out relevant documentation and review	**3**	**9**	**-**	**-**
PC25. carry out appropriate documentation following a health and safety incident at work, including all the required information	1	3	-	-
PC26. coordinate with the relevant personnel to review health and safety conditions at work regularly or following an incident	1	3	-	-
PC27. assist in implementing appropriate changes to improve the health and safety conditions at work	1	3	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N1335
NOS Name	Follow the health and safety practices at the work
Sector	Capital Goods
Sub-Sector	Machine Tools, Process Plant Machinery, Dies, Moulds and Press Tools, Electrical and Power Machinery, Plastics Manufacturing Machinery, Light Engineering Goods, Textile Manufacturing Machinery
Occupation	Machining
NSQF Level	3
Credits	TBD
Version	2.0
Last Reviewed Date	01/10/2025
Next Review Date	01/10/2028
NSQC Clearance Date	01/10/2025

CSC/N1336: Coordinate with co-workers to achieve work efficiency

Description

This OS unit is about working in coordination with co-workers to achieve the work objectives efficiently. It also covers practising inclusion at work.

Scope

The scope covers the following :

- Work effectively with co-workers
- Communicate effectively with co-workers
- Practice inclusion at work

Elements and Performance Criteria

Work effectively with co-workers

To be competent, the user/individual on the job must be able to:

PC1. plan daily tasks at work to ensure their timely completion and efficient use of time

PC2. carry out work responsibilities adhering to the limits of authority

PC3. follow the supervisor's instructions to ensure adherence to the applicable quality standards and timescales

PC4. coordinate with the co-workers to achieve the work objectives efficiently

PC5. prepare the relevant documents and reports as per the supervisor's instructions, providing appropriate information clearly and systematically

PC6. coordinate with the supervisor or relevant personnel to deal with out of authority tasks and concerns

PC7. mentor and assist subordinates in the execution of their work responsibilities

PC8. identify possible disruptions to work through coordination with the relevant stakeholders and take appropriate preventive measures

PC9. use various resources efficiently to ensure maximum utilisation and minimum wastage

PC10. follow the recommended practices to avoid and resolve conflicts at work

PC11. follow the relevant organisational policies to ensure disciplined behaviour with maximum productivity at work

Communicate effectively with co-workers

To be competent, the user/individual on the job must be able to:

PC12. follow the organisational policy for the efficient and timely dissemination of information to the authorised personnel

PC13. communicate clearly and politely to ensure effective communication with co-workers

PC14. follow the appropriate techniques for active listening during interactions

Practice inclusion at work

To be competent, the user/individual on the job must be able to:

PC15. empathise with Persons with Disabilities (PwD)

PC16. adopt gender-neutral behaviour at work

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the importance and process of effective communication in the workplace

KU2. the barriers to effective communication and how to overcome them

KU3. the importance of teamwork in an organisation's and individual's success

KU4. the importance of active listening in the work environment

KU5. the appropriate techniques to be followed for active listening

KU6. importance of avoiding casual expletives and unpleasant terms while communicating professional circles

KU7. the importance of maintaining discipline and ethical behaviour at work

KU8. the common reasons for interpersonal conflict and how to resolve them

KU9. the importance of developing effective work relationships for professional success

KU10. how expressing and addressing grievances appropriately and effectively

KU11. the importance and process of planning daily tasks to ensure their timely completion and efficient use of time

KU12. the importance of adhering to the limits of authority at work

KU13. the importance of following the applicable quality standards and timescales at work

KU14. the importance of coordinating with the co-workers to achieve the work objectives efficiently

KU15. the relevant documentation requirements

KU16. the importance of providing appropriate information clearly and systematically in work documents

KU17. the escalation matrix to be followed to deal with out of authority tasks and concerns

KU18. the importance and process of mentoring and assisting subordinates in the execution of their work responsibilities

KU19. how to identify possible disruptions to work prevent them

KU20. how to use various resources efficiently to ensure maximum utilisation and minimum wastage

KU21. the recommended practices to be followed at work to avoid and resolve conflicts at work

KU22. the importance and process of efficient and timely dissemination of information to the authorised personnel

KU23. how to communicate clearly and politely to ensure effective communication

KU24. the importance of following the recommended practices to ensure an inclusive environment for PwD and all genders at work

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. maintain work-related notes and records

GS2. read work-related and other relevant literature

GS3. communicate politely and -professionally

GS4. listen attentively to understand the information or instructions being shared

GS5. plan and prioritise tasks to ensure timely completion

GS6. take prompt decisions to deal with workplace emergencies and accidents

GS7. evaluate all possible solutions to a problem to select the best one

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Work effectively with co-workers	**20**	**43**	**-**	**-**
PC1. plan daily tasks at work to ensure their timely completion and efficient use of time	2	4	-	-
PC2. carry out work responsibilities adhering to the limits of authority	2	4	-	-
PC3. follow the supervisor's instructions to ensure adherence to the applicable quality standards and timescales	2	4	-	-
PC4. coordinate with the co-workers to achieve the work objectives efficiently	2	4	-	-
PC5. prepare the relevant documents and reports as per the supervisor's instructions, providing appropriate information clearly and systematically	2	4	-	-
PC6. coordinate with the supervisor or relevant personnel to deal with out of authority tasks and concerns	2	4	-	-
PC7. mentor and assist subordinates in the execution of their work responsibilities	2	4	-	-
PC8. identify possible disruptions to work through coordination with the relevant stakeholders and take appropriate preventive measures	2	4	-	-
PC9. use various resources efficiently to ensure maximum utilisation and minimum wastage	2	4	-	-
PC10. follow the recommended practices to avoid and resolve conflicts at work	1	4	-	-
PC11. follow the relevant organisational policies to ensure disciplined behaviour with maximum productivity at work	1	3	-	-
Communicate effectively with co-workers	**6**	**15**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. follow the organisational policy for the efficient and timely dissemination of information to the authorised personnel	2	5	-	-
PC13. communicate clearly and politely to ensure effective communication with co-workers	2	5	-	-
PC14. follow the appropriate techniques for active listening during interactions	2	5	-	-
Practice inclusion at work	**4**	**12**	**-**	**-**
PC15. empathise with Persons with Disabilities (PwD)	2	6	-	-
PC16. adopt gender-neutral behaviour at work	2	6	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N1336
NOS Name	Coordinate with co-workers to achieve work efficiency
Sector	Capital Goods
Sub-Sector	Machine Tools, Dies, Moulds and Press Tools, Plastics Manufacturing Machinery, Textile Manufacturing Machinery, Process Plant Machinery, Electrical and Power Machinery, Light Engineering Goods
Occupation	Machining
NSQF Level	3
Credits	TBD
Version	2.0
Last Reviewed Date	01/10/2025
Next Review Date	01/10/2028
NSQC Clearance Date	01/10/2025

CSC/N0402: Create and modify 3D mechanical engineering drawings using the CAD system

Description

This OS unit is about setting up and using a CAD system to produce 3D drawings for engineering activities following the approved procedures

Scope

The scope covers the following :

- Prepare for creating 3D mechanical engineering drawings
- Perform the set-up activities
- Create or modify 3D mechanical engineering drawings
- Use resources optimally

Elements and Performance Criteria

Prepare for creating 3D mechanical engineering drawings

To be competent, the user/individual on the job must be able to:

PC1. use appropriate sources such as drawing brief to obtain the technical information relevant to the drawing to be created

PC2. identify design features appropriate to the drawing being produced

PC3. check the data and information received to ensure it is correct and complete

PC4. establish the drawing requirements from the data and information received

PC5. follow the organisational procedure to report and rectify any incorrect and inconsistent information in the job specification documents

PC6. select the relevant drawing software and drafting equipment appropriate to the selected drawing method

Perform the set-up activities

To be competent, the user/individual on the job must be able to:

PC7. customize system variables, menus and drawing defaults to produce the drawing to the appropriate scale

PC8. develop macros as per the approved procedures

PC9. set up and check that all relevant devices are connected and operating,

PC10. check if an interface with ERP is required and available

PC11. set the drawing datum at a convenient point along with drawing parameters such as layers, line types, colour, text styles according to the drawing to be produced

Create or modify 3D mechanical engineering drawings

To be competent, the user/individual on the job must be able to:

PC12. analyze and produce 3D mechanical drawings, using first angle orthographic projections, isometric/oblique projections, third angle orthographic projections, sectional views

PC13. create separate assembly view or isometric view

PC14. follow the drafting principles to produce various types of drawings that are consistent with applicable standards and procedures for use in various engineering activities

PC15. perform assembly and motion analysis for the moving parts of the assembly

PC16. create a drawing template using the appropriate drawing tool according to the required standards, including all the necessary details

PC17. use the relevant Industry 4.0 manufacturing technologies to ensure interconnectivity, automation, machine learning, and real-time data collection and analysis

PC18. ensure to mention the desired qualities required in the finished components such as hardness, grinding, blackening, chrome plating, paint colour, etc.

PC19. use the relevant terminologies in the drawings

PC20. use the recommended techniques to create drawings in the required formats, ensuring the drawings are detailed

PC21. use various menus available in the CAD system along with relevant codes and references

PC22. draw temporary fasteners and rivets, components details, assembly drawings, piping layouts, gears and machine foundation, jigs and fixtures, nailed drawings of dies, moulds and press tools dimensions

PC23. create all required views such as section and detailed views to avoid any issues during machining

PC24. label the drawings as per approved procedures

PC25. create detailed views using various scales to as per the requirement

PC26. ensure to provide geometrical accuracies, such as run out surface finishing circularity, cylindricity, perpendicularity, on the desired portion of the component

PC27. coordinate with the relevant person to get the drawings checked and approved

PC28. edit the drawings as per the feedback, ensuring any changes are made as per the organisational procedures

PC29. follow the standard sizes of raw materials available in the market, while designing to avoid wastage of resources, such as raw material

PC30. check the drawings are correctly titled and referenced

PC31. check for the intersection of components with each other in the assembly mode

PC32. load testing and simulation before finalising the drawing

PC33. save the drawing to an appropriate storage medium such as a hard drive or USB pen drive, while creating a backup to protect against accidental loss

PC34. prepare the bill of materials as per organisational guidelines after determining the required component, material specifications, and appropriate quantities

PC35. use the CAD system appropriately as per the user manual

Use resources optimally

To be competent, the user/individual on the job must be able to:

PC36. optimize the usage of electricity and other resources in various tasks and processes

PC37. connect the electrical tools and equipment safely, and turn them off when not in use

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. use of relevant information systems for retrieving and storing drawing data

KU2. the concepts and benefits of Industry 4.0 and Industrial Internet of Things (IIoT)

KU3. the relevant customizable system variables in a CAD software

KU4. the needs and process for customizing identified system variables

KU5. applicable drafting standards and procedures

KU6. the needs and process for customizing menus and system defaults

KU7. the needs and process for developing macros

KU8. the appropriate projection for the drawing purpose

KU9. the relevant reasons for including auxiliary views in drawings

KU10. the procedures for producing component, layout and assembly drawings

KU11. relevant drawing specifications and common symbols used in drawings

KU12. the relevant sources and methods for obtaining any required technical information relevant to the drawing

KU13. the common practices that make systems vulnerable to cyber-attacks, viruses and damage

KU14. how to protect a computer from cyber-attacks and viruses

KU15. the appropriate procedure to be followed to deal with virus attacks on a computer

KU16. how to set up and use a computer system and the relevant peripherals light pen, digitizer and tablet, printer or plotter, scanner, etc.

KU17. how to various computer drawing software

KU18. the importance of using CAD software as per the instructions in the user manual

KU19. relevant principles of engineering and manufacturing operations that are applied in manufacturing processes such as casting and forging fabrication machining methods joining processes assembly and installation, etc.

KU20. different types of drawings that may be produced using a CAD software

KU21. the process of selecting standard components in the designing process

KU22. the functionality of different components, their interrelation with other components and assemblies

KU23. how to set up the viewing screen to show multiple views of the drawing

KU24. relevant standards and conventions used for drawings

KU25. how to set up the drawing template parameters

KU26. the application and use of various drawing tools

KU27. how to access and use a wide range of standard components and symbol libraries from the CAD equipment

KU28. the need for document control

KU29. the importance and process of saving and storing drawings

KU30. the importance and process of creating backup copies, and saving them safely

KU31. how to produce hard copies of drawings, and the advantages and disadvantages of printers and plotters

KU32. the technical information relevant to the drawing to be created such as drawing brief, overall dimensions, materials to be used, applicable special procedures for manufacturing, limits and fits, tapping drill charts, contraction allowances, etc.

KU33. the applicable design features such as interface, tolerance, etc.

KU34. use of relevant computer peripherals such as light pen, digitizer/tablet, scanner, printer, plotter, etc.

KU35. different types of drawings such as detail drawings, sub-assembly drawings, general arrangement drawings, installation drawings, etc.

KU36. applicable standards and procedures such as organizational guidelines and procedures, relevant directives or codes of practice, CAD software standards/protocols, national and international standards and directives, etc.

KU37. applicable health, safety and environmental concerns

KU38. relevant engineering activities such as processing of materials, fabrication, finishing, assembly, joining, commissioning/decommissioning, equipment installation, etc.

KU39. operational activities such as movement of materials, preparation of workplace layouts and work-flow diagrams

KU40. various functions of drawing template in the CAD software such as layers of drawings, scale, paper size, colour setup, line types, dimension system, title, drawing number, date, text styles, curved/contour lines, angled lines, circles or ellipses, geometrical and dimensional tolerance, elevation, plane view, side view, sectional view, detailed view, etc.

KU41. relevant activities done during preparing drawings in the CAD software such as hatching and shading on drawings, adding dimensions and text to drawings, producing layers of drawings, etc.

KU42. relevant symbols and abbreviations

KU43. how to create assembly and isometric views

KU44. how to perform assembly and motion analysis for moving parts of the assembly

KU45. the importance of mentioning the desired qualities required in the finish component, such as hardness, grinding, blackening, chrome plating, paint colour, etc.

KU46. the importance of making all possible views before releasing the drawing to avoid issues during machining

KU47. the importance of describing geometrical accuracies, such as runout surface finishing circularity, cylindricity, perpendicularity, on the desired portion of the component

KU48. the importance of considering the standard sizes of raw material available in the market, during designing to avoid wastage of resources

KU49. how to check for the intersection of components with each other in the assembly mode

KU50. how to perform load testing and simulation before finalising the drawing

KU51. the benefits and methods of resource optimisation

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. maintain work-related notes and records

GS2. read the relevant literature to learn about the latest developments in the field of work

GS3. communicate politely and professionally

GS4. listen attentively to understand the information or instructions being shared

GS5. plan and schedule tasks to ensure timely completion

GS6. identify possible disruptions to work and take appropriate preventive measures

GS7. take quick decisions to deal with workplace emergencies/ accidents

GS8. evaluate all possible solutions to a problem to select the best one

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare for creating 3D mechanical engineering drawings	**6**	**11**	**-**	**-**
PC1. use appropriate sources such as drawing brief to obtain the technical information relevant to the drawing to be created	1	2	-	-
PC2. identify design features appropriate to the drawing being produced	1	2	-	-
PC3. check the data and information received to ensure it is correct and complete	1	2	-	-
PC4. establish the drawing requirements from the data and information received	1	1	-	-
PC5. follow the organisational procedure to report and rectify any incorrect and inconsistent information in the job specification documents	1	2	-	-
PC6. select the relevant drawing software and drafting equipment appropriate to the selected drawing method	1	2	-	-
Perform the set-up activities	**5**	**10**	**-**	**-**
PC7. customize system variables, menus and drawing defaults to produce the drawing to the appropriate scale	1	2	-	-
PC8. develop macros as per the approved procedures	1	2	-	-
PC9. set up and check that all relevant devices are connected and operating,	1	2	-	-
PC10. check if an interface with ERP is required and available	1	2	-	-
PC11. set the drawing datum at a convenient point along with drawing parameters such as layers, line types, colour, text styles according to the drawing to be produced	1	2	-	-
Create or modify 3D mechanical engineering drawings	**17**	**45**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. analyze and produce 3D mechanical drawings, using first angle orthographic projections, isometric/oblique projections, third angle orthographic projections, sectional views	1	2	-	-
PC13. create separate assembly view or isometric view	1	1	-	-
PC14. follow the drafting principles to produce various types of drawings that are consistent with applicable standards and procedures for use in various engineering activities	-	1	-	-
PC15. perform assembly and motion analysis for the moving parts of the assembly	-	1	-	-
PC16. create a drawing template using the appropriate drawing tool according to the required standards, including all the necessary details	-	2	-	-
PC17. use the relevant Industry 4.0 manufacturing technologies to ensure interconnectivity, automation, machine learning, and real-time data collection and analysis	-	2	-	-
PC18. ensure to mention the desired qualities required in the finished components such as hardness, grinding, blackening, chrome plating, paint colour, etc.	1	2	-	-
PC19. use the relevant terminologies in the drawings	-	2	-	-
PC20. use the recommended techniques to create drawings in the required formats, ensuring the drawings are detailed	1	2	-	-
PC21. use various menus available in the CAD system along with relevant codes and references	1	2	-	-
PC22. draw temporary fasteners and rivets, components details, assembly drawings, piping layouts, gears and machine foundation, jigs and fixtures, nailed drawings of dies, moulds and press tools dimensions	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC23. create all required views such as section and detailed views to avoid any issues during machining	1	2	-	-
PC24. label the drawings as per approved procedures	1	2	-	-
PC25. create detailed views using various scales to as per the requirement	1	2	-	-
PC26. ensure to provide geometrical accuracies, such as run out surface finishing circularity, cylindricity, perpendicularity, on the desired portion of the component	1	2	-	-
PC27. coordinate with the relevant person to get the drawings checked and approved	1	2	-	-
PC28. edit the drawings as per the feedback, ensuring any changes are made as per the organisational procedures	1	2	-	-
PC29. follow the standard sizes of raw materials available in the market, while designing to avoid wastage of resources, such as raw material	1	2	-	-
PC30. check the drawings are correctly titled and referenced	-	2	-	-
PC31. check for the intersection of components with each other in the assembly mode	-	2	-	-
PC32. load testing and simulation before finalising the drawing	1	2	-	-
PC33. save the drawing to an appropriate storage medium such as a hard drive or USB pen drive, while creating a backup to protect against accidental loss	1	2	-	-
PC34. prepare the bill of materials as per organisational guidelines after determining the required component, material specifications, and appropriate quantities	1	2	-	-
PC35. use the CAD system appropriately as per the user manual	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Use resources optimally	**2**	**4**	**-**	**-**
PC36. optimize the usage of electricity and other resources in various tasks and processes	1	2	-	-
PC37. connect the electrical tools and equipment safely, and turn them off when not in use	1	2	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CSC/N0402
NOS Name	Create and modify 3D mechanical engineering drawings using the CAD system
Sector	Capital Goods
Sub-Sector	Machine Tools, Plastics Manufacturing Machinery, Textile Manufacturing Machinery, Process Plant Machinery, Electrical and Power Machinery, Light Engineering Goods
Occupation	Design
NSQF Level	4
Credits	10
Version	4.0
Last Reviewed Date	08/05/2025
Next Review Date	08/05/2028
NSQC Clearance Date	08/05/2025

DGT/VSQ/N0101: Employability Skills (30 Hours)

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

Elements and Performance Criteria

Introduction to Employability Skills

To be competent, the user/individual on the job must be able to:

PC1. understand the significance of employability skills in meeting the job requirements

Constitutional values – Citizenship

To be competent, the user/individual on the job must be able to:

PC2. identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices

Becoming a Professional in the 21st Century

To be competent, the user/individual on the job must be able to:

PC3. explain 21st Century Skills such as Self-Awareness, Behavior Skills, Positive attitude, self-motivation, problem-solving, creative thinking, time management, social and cultural awareness, emotional awareness, continuous learning mindset etc.

Basic English Skills

To be competent, the user/individual on the job must be able to:

PC4. speak with others using some basic English phrases or sentences

Communication Skills

To be competent, the user/individual on the job must be able to:

PC5. follow good manners while communicating with others

PC6. work with others in a team

Diversity & Inclusion

To be competent, the user/individual on the job must be able to:

PC7. communicate and behave appropriately with all genders and PwD

PC8. report any issues related to sexual harassment

Financial and Legal Literacy

To be competent, the user/individual on the job must be able to:

PC9. use various financial products and services safely and securely

PC10. calculate income, expenses, savings etc.

PC11. approach the concerned authorities for any exploitation as per legal rights and laws

Essential Digital Skills

To be competent, the user/individual on the job must be able to:

PC12. operate digital devices and use its features and applications securely and safely

PC13. use internet and social media platforms securely and safely

Entrepreneurship

To be competent, the user/individual on the job must be able to:

PC14. identify and assess opportunities for potential business

PC15. identify sources for arranging money and associated financial and legal challenges

Customer Service

To be competent, the user/individual on the job must be able to:

PC16. identify different types of customers

PC17. identify customer needs and address them appropriately

PC18. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

To be competent, the user/individual on the job must be able to:

PC19. create a basic biodata

PC20. search for suitable jobs and apply

PC21. identify and register apprenticeship opportunities as per requirement

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. need for employability skills

KU2. various constitutional and personal values

KU3. different environmentally sustainable practices and their importance

KU4. Twenty first (21st) century skills and their importance

KU5. how to use basic spoken English language

KU6. Do and dont of effective communication

KU7. inclusivity and its importance

KU8. different types of disabilities and appropriate communication and behaviour towards PwD

KU9. different types of financial products and services

KU10. how to compute income and expenses

KU11. importance of maintaining safety and security in financial transactions

KU12. different legal rights and laws

KU13. how to operate digital devices and applications safely and securely

KU14. ways to identify business opportunities

KU15. types of customers and their needs

KU16. how to apply for a job and prepare for an interview

KU17. apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. communicate effectively using appropriate language

GS2. behave politely and appropriately with all

GS3. perform basic calculations

GS4. solve problems effectively

GS5. be careful and attentive at work

GS6. use time effectively

GS7. maintain hygiene and sanitisation to avoid infection

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Introduction to Employability Skills	**1**	**1**	**-**	**-**
PC1. understand the significance of employability skills in meeting the job requirements	-	-	-	-
Constitutional values – Citizenship	**1**	**1**	**-**	**-**
PC2. identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices	-	-	-	-
Becoming a Professional in the 21st Century	**1**	**3**	**-**	**-**
PC3. explain 21st Century Skills such as Self-Awareness, Behavior Skills, Positive attitude, self-motivation, problem-solving, creative thinking, time management, social and cultural awareness, emotional awareness, continuous learning mindset etc.	-	-	-	-
Basic English Skills	**2**	**3**	**-**	**-**
PC4. speak with others using some basic English phrases or sentences	-	-	-	-
Communication Skills	**1**	**1**	**-**	**-**
PC5. follow good manners while communicating with others	-	-	-	-
PC6. work with others in a team	-	-	-	-
Diversity & Inclusion	**1**	**1**	**-**	**-**
PC7. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC8. report any issues related to sexual harassment	-	-	-	-
Financial and Legal Literacy	**3**	**4**	**-**	**-**
PC9. use various financial products and services safely and securely	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. calculate income, expenses, savings etc.	-	-	-	-
PC11. approach the concerned authorities for any exploitation as per legal rights and laws	-	-	-	-
Essential Digital Skills	**4**	**6**	**-**	**-**
PC12. operate digital devices and use its features and applications securely and safely	-	-	-	-
PC13. use internet and social media platforms securely and safely	-	-	-	-
Entrepreneurship	**3**	**5**	**-**	**-**
PC14. identify and assess opportunities for potential business	-	-	-	-
PC15. identify sources for arranging money and associated financial and legal challenges	-	-	-	-
Customer Service	**2**	**2**	**-**	**-**
PC16. identify different types of customers	-	-	-	-
PC17. identify customer needs and address them appropriately	-	-	-	-
PC18. follow appropriate hygiene and grooming standards	-	-	-	-
Getting ready for apprenticeship & Jobs	**1**	**3**	**-**	**-**
PC19. create a basic biodata	-	-	-	-
PC20. search for suitable jobs and apply	-	-	-	-
PC21. identify and register apprenticeship opportunities as per requirement	-	-	-	-
NOS Total	**20**	**30**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0101
NOS Name	Employability Skills (30 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	2
Credits	1
Version	1.0
Last Reviewed Date	16/12/2025
Next Review Date	18/11/2028
NSQC Clearance Date	16/12/2025

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for the Qualification Pack will be created by CGSC.

2. Performance Criteria (PC) have been assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.

3. The assessment for the theory part will/may be based on knowledge bank of questions approved CGSC.

4. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.

5. Assessment Agencies will create Assessor Guides comprising of Theory and Practical Assessment Set and Guidelines for each examination/training centre (as per assessment criteria below). The same will be approved by CGSC for adequacy.

6. To successfully attain Certification on the Qualification Pack, the trainee must score a minimum of 70% in each Core NOS and minimum of 70% in all non-core NOS. In addition, a candidate needs to attain a minimum overall pass percentage of 70% for certification.

7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Minimum Aggregate Passing % at QP Level : 70

(**Please note**: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
CSC/N1335.Follow the health and safety practices at the work	30	70	-	-	100	20
CSC/N1336.Coordinate with co-workers to achieve work efficiency	30	70	-	-	100	15
CSC/N0402.Create and modify 3D mechanical engineering drawings using the CAD system	30	70	0	0	100	35
DGT/VSQ/N0101.Employability Skills (30 Hours)	20	30	-	-	50	30
Total	**110**	**240**	**-**	**-**	**350**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
CNC	Computer Numerically Controlled
CAD	Computer Aided Design
2D	2 Dimensional
3D	3 Dimensional
CO2	Carbon Dioxide
CPR	Cardiac Pulmonary Resuscitation
ISO	International Organization For Standardization
PPE	Personal Protective Equipment
CD	Compact Disc
DVD	Digital Video Disc Or Digital Versatile Disc

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.