

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR CAPITAL GOODS INDUSTRY

What are Occupational Standards(OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualifications Pack: Draughtsman - Mechanical

SECTOR: CAPITAL GOODS

SUB-SECTOR:

- | | |
|-------------------------------------|-----------------------------------|
| 1. Machine Tools | 5. Process Plant Machinery |
| 2. Dies, Moulds and Press Tools | 6. Electrical and Power Machinery |
| 3. Plastics Manufacturing Machinery | 7. Light Engineering Goods |
| 4. Textile Manufacturing Machinery | |

OCCUPATION: Design

REFERENCE ID: CSC/ Q 0402

Aligned to: NCO-2004/NIL

Draughtsman - Mechanical: Creation and modification of 2D mechanical engineering design using CAD system. It also involves the detail drafting of component drawings for manufacturing, assembly, sub-assembly, installation.

Brief Job Description: It involves select the appropriate equipment and drawing software to use based on the type and complexity of the drawing functions to be carried out and the use of a CAD system linked bills of material, file management and associated customization of installed software including the use of macros, menus and default settings.

Personal Attributes: Basic communication, numerical and computational abilities. Openness to learning, ability to plan and organize own work and identify and solve problems in the course of working. Understanding the need to take initiative and manage self and work to improve efficiency and effectiveness

Job Details	Qualifications Pack Code	CSC/ Q 0402		
	Job Role	Draughtsman - Mechanical		
	Credits (NSQF)		Version number	1.0
	Sector	CAPITAL GOODS	Drafted on	14/04/14
	Sub-sector	<ol style="list-style-type: none"> 1. Machine Tools 2. Dies, Moulds And Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods 	Last reviewed on	
	Occupation	DESIGN	Next review date	30/08/16

Job Role	Draughtsman - Mechanical
Role Description	Creation and modification of 2D mechanical engineering design using CAD system. It also involves the detail drafting of component drawings for manufacturing, assembly, sub-assembly, installation, etc.
NSQF level	4
Minimum Educational Qualifications	10 th Standard
Maximum Educational Qualifications	N.A.
Training (Suggested but not mandatory)	Computer Aided Design System Training
Experience	No Previous Experience Required
Applicable National Occupational Standards (NOS)	<p>Compulsory:</p> <ol style="list-style-type: none"> CSC/ N 0402 (Make or modify changes to 2D mechanical engineering drawings using CAD system) CSC/ N 1335 (Use basic health and safety practices at the workplace) CSC/ N 1336 (Work effectively with others) <p>Optional: N.A.</p>
Performance Criteria	As described in the relevant OS units

Definitions

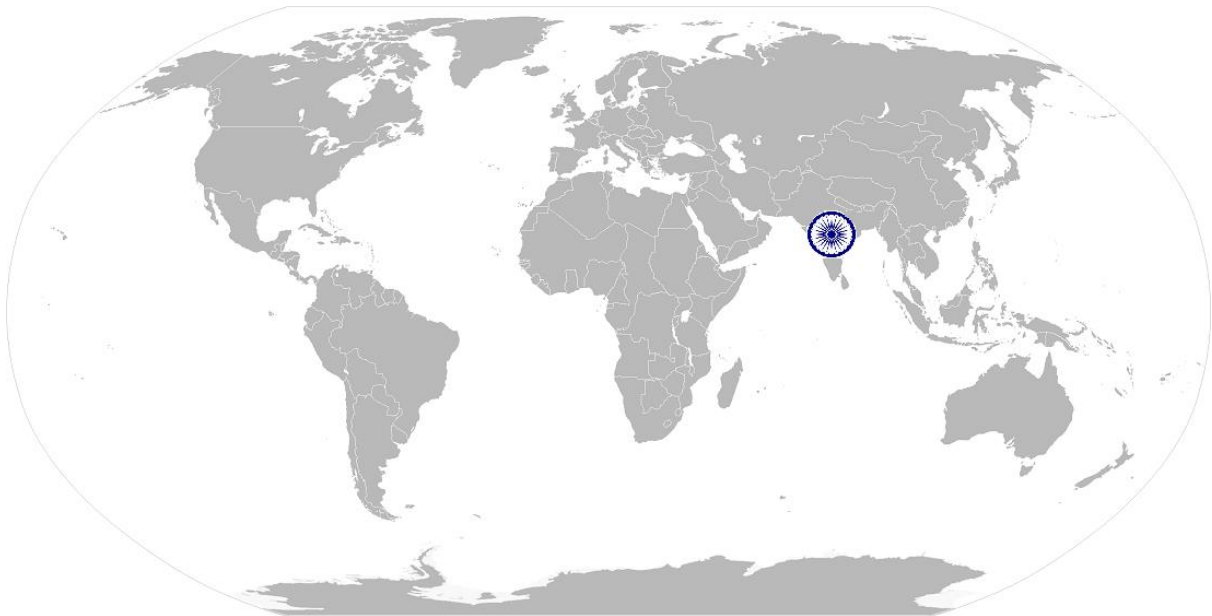
Keywords /Terms	Description
Core Skills/Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of NOS.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Organisational Context	Organisational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
Qualifications Pack(QP)	Qualifications Pack comprises the set of NOS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Scope	Scope is the 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 the quality of performance required.
Sector	Sector is a conglomeration of different business operations having similar businesses 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.
Sub-functions	Sub-functions are sub-activities essential to fulfil the achieving the objectives of the function.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Unit Code	Unit Code is a unique identifier for a NOS unit, which can be denoted with an 'N'
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Vertical	Vertical may exist within a sub-sector representing different domain areas or the client industries served by the industry.

Acronyms

Keywords /Terms	Description
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

CSC/ N 0402: Make or modify 2D mechanical engineering drawings using CAD system

National Occupational Standard



Overview

This unit covers the creation and modification of 2D mechanical engineering design using CAD system. It also involves the detail drafting of drawings for manufacturing, assembly, sub-assembly, installation etc.

CSC/ N 0402: Make or modify 2D mechanical engineering drawings using CAD system

National Occupational Standard

Unit Code	CSC / N 0402
Unit Title (Task)	Make or modify 2D mechanical engineering drawings using CAD system
Description	<p>This unit covers the skills and knowledge needed to set up and operate a computer aided drawing (CAD) system to produce detailed drawings for engineering activities, in accordance with approved procedures.</p> <p>It involves the use of a CAD system linked bills of material, files management and associated customization of installed software including the use of macros, menus and default settings. File formats may include IGES, DXF, HPGL, etc. 2D drawings may be produced from 3D models created using computer aided design system.</p> <p>The candidate will be expected to work unsupervised taking full responsibility for their actions receiving guidance and support from senior management and designers.</p>
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Preparing for 2D mechanical engineering drawings • Performing set-up activities • Make or modify 2D mechanical engineering drawings using CAD system
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Preparing for 2D mechanical engineering drawings	<p>The user/individual on the job should be able to:</p> <p>PC1. use appropriate sources to obtain the technical information relevant to the drawing to be created</p> <p>Technical information relevant to the drawing to be created: drawing brief; specifications(overall dimensions, materials, special procedures for manufacturing); drawing change or modification request; regulations; existing drawings/designs, sketches, notes from meetings/discussions; standards reference documents (eg. limits and fits, tapping drill charts, contraction allowances)</p> <p>PC2. identify design features, as appropriate to the drawing being produced</p> <p>Design features: function, materials, clearance, operating environment, quality, aesthetics, interfaces, physical space; tolerances</p> <p>PC3. ensure that the data and information received is complete and correct</p> <p>PC4. establish the drawing requirements from the data and information received</p> <p>PC5. report and rectify incorrect and inconsistent information in job specification documents as per organization procedures</p> <p>PC6. access and use the correct drawing software</p> <p>PC7. select drafting equipment appropriate to the drawing method chosen</p> <p>PC8. check that all the equipment is correctly connected and in a safe and usable working condition</p> <p>PC9. power up the equipment and activate the appropriate drawing software</p>
Performing set-up activities	<p>The user/individual on the job should be able to:</p> <p>PC10. customize system variables, menus and drawing defaults to produce the</p>

CSC/ N 0402: Make or modify 2D mechanical engineering drawings using CAD system

	<p>drawing to the appropriate scale</p> <p>PC11. develop macros as per approved procedures</p> <p>PC12. set up and check that all peripheral devices are connected and correctly operating and interface with ERP if required is available Peripheral devices could be: keyboard, mouse, light pen, digitizer/tablet, scanner, printer, plotter, etc.</p> <p>PC13. set the drawing datum at a convenient point</p> <p>PC14. set up drawing parameters (eg. layers, line types, color, text styles) to company procedures or to suit the drawing produced</p>
Make or modify 2D mechanical engineering drawings using CAD system	<p>The user/individual on the job should be able to:</p> <p>PC15. interpret and produce mechanical drawings, using first angle orthographic projections, isometric/oblique projections, third angle orthographic projections, sectional views</p> <p>PC16. apply drafting principles to produce various types of drawings that are consistent with applicable standards and procedures for use in various engineering activities Types of drawings: detail drawings, sub-assembly drawings, general arrangement drawings, installation drawings, exploded views Standards and procedures: organizational guidelines and procedures, recognized compliance agency/body standards, directives or codes of practice, CAD software standards/protocols, national and/or International standards or directives, customer standards and requirements, health, safety and environmental requirements Engineering Activities: production activities (such as processing of materials, fabrication, finishing, assembly, joining); installation activities (such as commissioning/decommissioning, site preparation, equipment installation); operational activities (such as movement of materials, workplace layouts, work-flow diagrams), maintenance activities (such as planned preventative maintenance, part/sub-assembly exchange)</p> <p>PC17. create a drawing template to the required standards, which includes all necessary detail (eg.) using various drawing tools Drawing template details: layers of drawings, scale, paper size, color setup, line types, dimension system, title, drawing number, date, text styles Drawing Tools: straight lines, hatching and shading on drawings, adding dimensions and text to drawings, producing layers of drawings, symbols and abbreviations, hidden detail, curved/contour lines, angled lines, circles or ellipses; parts lists, geometrical and dimensional tolerance, insertion of standard components, elevation, plane view, side view, sectional views, detail views</p> <p>PC18. use appropriate terminologies and techniques to create drawings, in the required formats, that are sufficiently and clearly detailed</p> <p>PC19. use keyboard command and pull down menus available in common CAD systems</p>

CSC/ N 0402: Make or modify 2D mechanical engineering drawings using CAD system

	<p>PC20. use codes and other references that follow the required conventions</p> <p>PC21. draw temporary fasteners and rivets</p> <p>PC22. draw components details and assembly drawings</p> <p>PC23. draw piping layouts, gears and machine foundation or base</p> <p>PC24. draw working drawings of jigs and fixtures</p> <p>PC25. draw detailed drawings of dies, moulds and press tools</p> <p>PC26. dimension and label the drawing as per approved procedures</p> <p>PC27. create detailed views using various scales to meet job requirements</p> <p>PC28. ensure that drawings are checked and approved by the appropriate person</p> <p>PC29. produce hard copies of the finished drawings</p> <p>PC30. check that the drawing is correctly titled and referenced; saving is correctly titled and referenced</p> <p>PC31. save the drawing to an appropriate storage medium (eg. hard drive, CD/DVD, external storage device)</p> <p>PC32. create a separate backup copy and place it in safe storage</p> <p>PC33. identify component parts list with part name, description of part, material specification or part number, quantities and other details to prepare bill of materials as per organizational guidelines</p> <p>PC34. deal promptly and effectively with problems within control and seek help and guidance from the relevant people if you have problems that they cannot resolve</p> <p>PC35. ensure that changes are completed as required by organizational procedures</p> <p>PC36. shut down the CAD system to a safe condition on completion of the drawing activities</p>
Knowledge and Understanding (K)	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions</p> <p>KA2. relevant health and safety requirements applicable in the work place</p> <p>KA3. importance of working in clean and safe environment</p> <p>KA4. own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities</p> <p>KA5. reporting structure, inter-dependent functions, lines and procedures in the work area</p> <p>KA6. relevant people and their responsibilities within the work area</p> <p>KA7. escalation matrix and procedures for reporting work and employment related issues</p> <p>KA8. documentation and related procedures applicable in the context of employment and work</p> <p>KA9. importance and purpose of documentation in context of employment and work</p>

CSC/ N 0402: Make or modify 2D mechanical engineering drawings using CAD system

<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> KB1. organizational procedures and information systems for retrieving and storing drawing data KB2. system variables that can be customized KB3. procedures and need for customizing identified system variables KB4. applicable drafting standards/procedures KB5. procedures and need for customizing menus and system defaults KB6. procedures and need for developing macros KB7. appropriate projection for the drawing purpose KB8. reasons for selecting the chosen projection KB9. reasons for including auxiliary views in drawings KB10. procedures for producing component, layout and/or assembly drawings KB11. drawing specifications KB12. common symbols used in drawings KB13. how and where to obtain the relevant sources and methods for obtaining any required technical information relevant to the drawing KB14. methods and procedures used to minimize the chances of infecting a computer with a virus KB15. procedure to follow in case there are corruptions or virus attacks KB16. practices that make systems vulnerable to corruption and damage KB17. basic set-up and operation of the computer system, and the peripheral devices that are used (eg. light pen, digitizer and tablet, printer or plotter, scanner) KB18. how to access the specific computer drawing software to be used, and the use of software manuals and related documents to aid operation of the relevant drawing system KB19. basic principles of engineering manufacturing operations that are used to produce the drawn item Basic principles of engineering manufacturing operations: casting and forging; fabrication; machining methods; joining processes; assembly and installation methods; limitations of the equipment/processes; kinematics principles relevant to manufacturing of machinery KB20. types of drawings that may be produced by the software KB21. selection of standard components KB22. functionality of the component being drawn, and its interrelationship with other components and assemblies KB23. how to set up the viewing screen to show multiple views of the drawing to help with drawing creation KB24. standards and conventions that are used for the drawings KB25. how to set up the drawing template parameters KB26. application and use of drawing tools KB27. how to access, recognize and use a wide range of standard components and symbol libraries from the CAD equipment KB28. need for document control KB29. how to save and store drawings KB30. need to create backup copies, and to file them in a separate and safe location KB31. how to produce hard copies of the drawings, and the advantages and disadvantages of printers and plotters
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CSC/ N 0402: Make or modify 2D mechanical engineering drawings using CAD system

Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Communication
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. read and interpret information correctly from various job specification documents, manuals, health and safety instructions, memos, etc. applicable to the job in English and/or local language</p> <p>SA2. fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language</p> <p>SA3. convey and share technical information clearly using appropriate language</p> <p>SA4. check and clarify task-related information</p> <p>SA5. liaise with appropriate authorities using correct protocol</p> <p>SA6. communicate with people in respectful form and manner in line with organizational protocol</p>
	Numerical and computational skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. undertake numerical operations, and calculations/ formulae Numerical computations: addition, subtraction, multiplication, division, fractions and decimals, percentages and proportions, simple ratios and averages</p> <p>SA8. identify and draw various basic, compound and solid shapes as per dimensions given Basic shapes: square, rectangle, triangle, circle Compound shapes: involving squares, rectangles, triangles, circles, semi-circles, quadrants of a circle Solid shapes: cube, rectangular prism, cylinder</p> <p>SA9. use appropriate units and number systems to express degree of accuracy Units and number systems representing degree of accuracy: decimals places, significant figures, fractions as a decimal quantity</p> <p>SA10. interpret and express tolerance in terms of limits on dimensions</p> <p>SA11. calculation of the value of angles in a triangle Angles in a triangle: right-angled, isosceles, equilateral</p>
	Learning
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA12. participate in on-the-job and other learning, training and development interventions and assessments</p> <p>SA13. clarify task related information with appropriate personnel or technical adviser</p> <p>SA14. seek to improve and modify own work practices</p> <p>SA15. maintain current knowledge of application standards, legislation, codes of practice and product/process developments</p>
	Computer Basics
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA16. perform basic operations in a computer like switching it on/off, using the mouse and keyboard, accessing files, opening, closing, creating and deleting folders, etc.</p>

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	<p>SA17. access and use word-processors and spreadsheets in a computer</p> <p>SA18. retrieve and enter data using standard system forms and templates</p> <p>SA19. receive and send emails using preset email accounts</p> <p>SA20. take printouts of documents</p>
B. Professional Skills	Problem Solving
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. identify problems with work planning, procedures, output and behavior and their implications</p> <p>SB2. prioritize and plan for problem solving</p> <p>SB3. communicate problems appropriately to others</p> <p>SB4. identify sources of information and support for problem solving</p> <p>SB5. seek assistance and support from other sources to solve problems</p> <p>SB6. identify effective resolution techniques</p> <p>SB7. select and apply resolution techniques</p> <p>SB8. seek evidence for problem resolution</p>
	Plan and Organize
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB9. plan, prioritize and sequence work operations as per job requirements</p> <p>SB10. organize and analyze information relevant to work</p> <p>SB11. basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time</p>
	Initiative and Enterprise
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB12. undertake and express new ideas and initiatives to others</p> <p>SB13. modify work plan to overcome unforeseen difficulties or developments that occur as work progresses</p> <p>SB14. participate in improvement procedures including process, quality and internal/external customer/supplier relationships</p> <p>SB15. one's competencies in new and different situations and contexts to achieve more</p>
	Self-Management
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB16. exercise restraint while expressing dissent and during conflict situations</p> <p>SB17. avoid and manage distractions to be disciplined at work</p> <p>SB18. manage own time for achieving better results</p>
	Teamwork
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB19. work in a team in order to achieve better results</p> <p>SB20. identify and clarify work roles within a team</p> <p>SB21. communicate and cooperate with others in the team for better results</p> <p>SB22. seek assistance from fellow team members</p>
	Critical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB23. apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action</p>

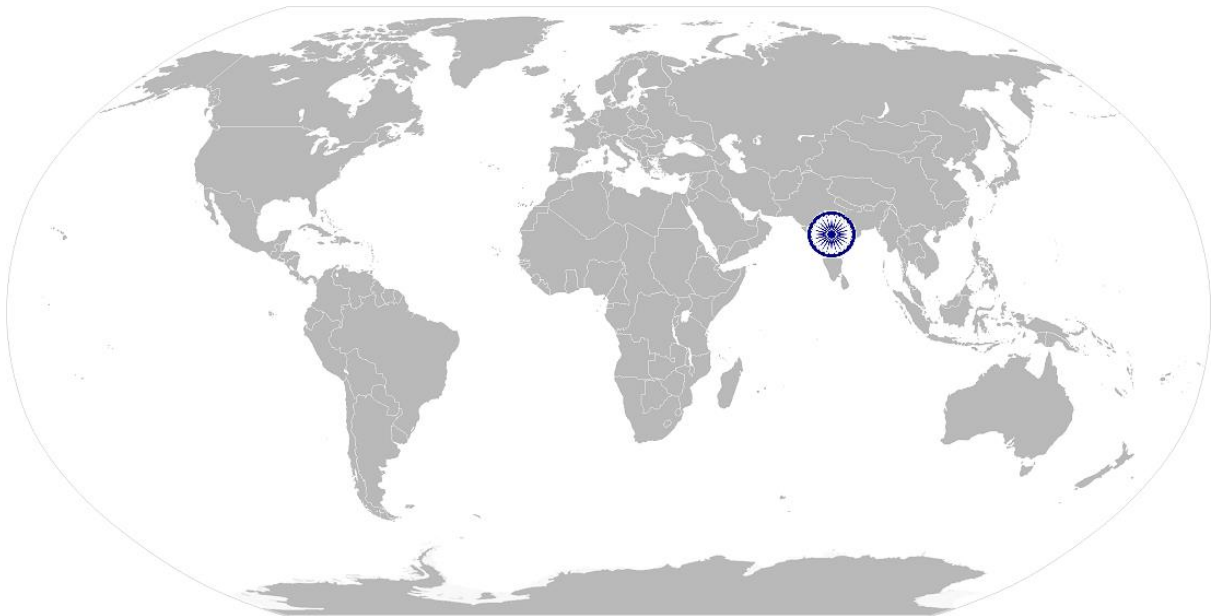
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NOS Version Control

NOS Code	CSC / N 0402		
Credits(NSQF)	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	14/04/14
Industry Sub-sector	<ol style="list-style-type: none"> 1. Machine Tools 2. Dies, Moulds And Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods 	Last reviewed on	
		Next review date	30/08/16

CSC/ N 1335: Use basic health and safety practices at the workplace

National Occupational Standard



Overview

This unit covers health, safety and security at the workplace. This includes procedures and practices that candidates need to follow to help maintain a healthy, safe and secure work environment.

CSC/ N 1335: Use basic health and safety practices at the workplace

Unit Code	CSC / N 1335
Unit Title (Task)	Use basic health and safety practices at the workplace
Description	<p>This OS unit is about knowledge and practices relating to health, safety and security that candidates need to use in the workplace. It covers responsibilities towards self, others, assets and the environment.</p> <p>It includes understanding of risks and hazards in the workplace, along with common techniques to minimize risk, deal with accidents, emergencies, etc.</p> <p>It covers knowledge of fire safety, common first aid applications, safe practices and emergency procedures.</p>
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Health and safety • Fire safety • Emergencies, rescue and first-aid procedures
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Health and safety	<p>The user/individual on the job should be able to:</p> <p>PC1. use protective clothing/equipment for specific tasks and work conditions</p> <p>Protective clothing: leather or asbestos gloves, flame proof aprons, flame proof overalls buttoned to neck, cuffless (without folds), trousers, reinforced footwear, helmets/hard hats, cap and shoulder covers, ear defenders/plugs, safety boots, knee pads, particle masks, glasses/goggles/visors</p> <p>Equipment: hand shields, machine guards, residual current devices, shields, dust sheets, respirator</p> <p>PC2. state the name and location of people responsible for health and safety in the workplace</p> <p>PC3. state the names and location of documents that refer to health and safety in the workplace</p> <p>PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace</p> <p>Hazards: sharp edged and heavy tools; heated metals; oxyfuel and gas cylinders; welding radiation; hazardous surfaces(sharp, slippery, uneven, chipped, broken, etc.); hazardous substances(chemicals, gas, oxy-fuel, fumes, dust, etc.); physical hazards(working at heights, large and heavy objects and machines, sharp and piercing objects, tolls and machines, intense light, load noise, obstructions in corridors, by doors, blind turns, noise, over stacked shelves and packages, etc.) electrical hazards (power supply and points, loose and naked cables and wires, electrical machines and appliances, etc.)</p>

CSC/ N 1335: Use basic health and safety practices at the workplace

	<p>Possible causes of risk and accident: physical actions; reading; listening to and giving instructions; inattention; sickness and incapacity (such as drunkenness); health hazards (such as untreated injuries and contagious illness)</p> <p>PC5. carry out safe working practices while dealing with hazards to ensure the safety of self and others</p> <p>Safe working practices: using protective clothing and equipment; putting up and reading safety signs; handle tools in the correct manner and store and maintain them properly; keep work area clear of clutter, spillage and unsafe object lying casually; while working with electricity take all electrical precautions like insulated clothing, adequate equipment insulation, use of control equipment, dry work area, switch off the power supply when not required, etc.; safe lifting and carrying practices; use equipment that is working properly and is well maintained; take due measures for safety while working in confined places, trenches or at heights, etc. including safety harness, fall arrestors, etc.</p> <p>PC6. state methods of accident prevention in the work environment of the job role</p> <p>Methods of accident prevention: training in health and safety procedures; using health and safety procedures; use of equipment and working practices (such as safe carrying procedures); safety notices, advice; instruction from colleagues and supervisors</p> <p>PC7. state location of general health and safety equipment in the workplace</p> <p>General health and safety equipment: fire extinguishers; first aid equipment; safety instruments and clothing; safety installations(eg fire exits, exhaust fans)</p> <p>PC8. inspect for faults, set up and safely use steps and ladders in general use</p> <p>Ladder faults: corrosion of metal components, deterioration, splits and cracks timber components, imbalance, loose rungs, missing/unfixed nuts or bolts, etc.</p> <p>Ladders set up: firm/level base, clip/lash down, leaning at the correct angle, etc.</p> <p>PC9. work safely in and around trenches, elevated places and confined areas</p> <p>PC10. lift heavy objects safely using correct procedures</p> <p>PC11. apply good housekeeping practices at all times</p> <p>Good housekeeping practices: clean/tidy work areas, removal/disposal of waste products, protect surfaces</p> <p>PC12. identify common hazard signs displayed in various areas</p> <p>Various areas: on chemical containers; equipment; packages; inside buildings; in open areas and public spaces, etc.</p> <p>PC13. retrieve and/or point out documents that refer to health and safety in the workplace</p>
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CSC/ N 1335: Use basic health and safety practices at the workplace

	<p>Documents: fire notices, accident reports, safety instructions for equipment and procedures, company notices and documents, legal documents (eg government notices)</p>
Fire safety	<p>The user/individual on the job should be able to:</p> <p>PC14. use the various appropriate fire extinguishers on different types of fires correctly</p> <p>Types of fires: Class A: eg. ordinary solid combustibles, such as wood, paper, cloth, plastic, charcoal, etc.; Class B: flammable liquids and gases, such as gasoline, propane, diesel fuel, tar, cooking oil, and similar substances; Class C: eg. electrical equipment such as appliances, wiring, breaker panels, etc. (These categories of fires become Class A, B, and D fires when the electrical equipment that initiated the fire is no longer receiving electricity); Class D: combustible metals such as magnesium, titanium, and sodium (These fires burn at extremely high temperatures and require special suppression agents)</p> <p>PC15. demonstrate rescue techniques applied during fire hazard</p> <p>PC16. demonstrate good housekeeping in order to prevent fire hazards</p> <p>PC17. demonstrate the correct use of a fire extinguisher</p>
Emergencies, rescue and first-aid procedures	<p>The user/individual on the job should be able to:</p> <p>PC18. demonstrate how to free a person from electrocution</p> <p>PC19. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.</p> <p>PC20. demonstrate basic techniques of bandaging</p> <p>PC21. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments</p> <p>PC22. perform and organize loss minimization or rescue activity during an accident in real or simulated environments</p> <p>PC23. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases</p> <p>PC24. demonstrate the artificial respiration and the CPR Process</p> <p>PC25. participate in emergency procedures</p> <p>Emergency procedures: raising alarm, safe/efficient, evacuation, correct means of escape, correct assembly point, roll call, correct return to work</p> <p>PC26. complete a written accident/incident report or dictate a report to another person, and send report to person responsible</p> <p>Incident Report includes details of: name, date/time of incident, date/time of report, location, environment conditions, persons involved, sequence of events, injuries sustained, damage sustained, actions taken, witnesses, supervisor/manager notified</p> <p>PC27. demonstrate correct method to move injured people and others during an emergency</p>
Knowledge and Understanding (K)	

CSC/ N 1335: Use basic health and safety practices at the workplace

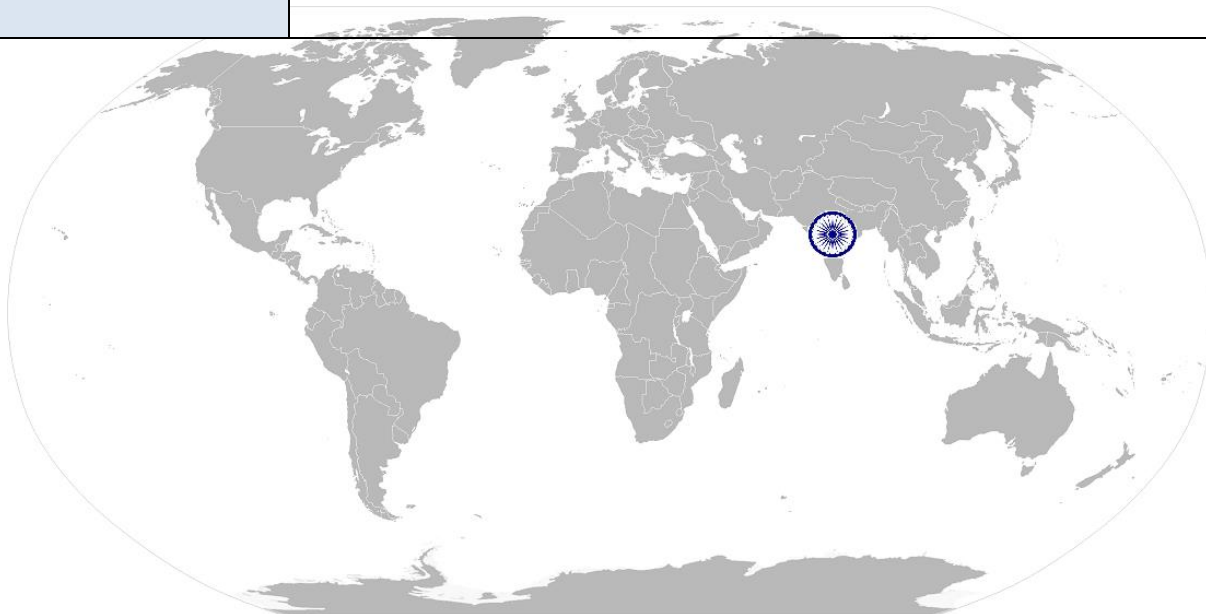
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. names (and job titles if applicable), and where to find, all the people responsible for health and safety in a workplace.</p> <p>KA2. names and location of documents that refer to health and safety in the workplace.</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. meaning of “hazards” and “risks”</p> <p>KB2. health and safety hazards commonly present in the work environment and related precautions</p> <p>KB3. possible causes of risk, hazard or accident in the workplace and why risk and/or accidents are possible</p> <p>KB4. possible causes of risk and accident Possible causes of risk and accident: physical actions; reading; listening to and giving instructions; inattention; sickness and incapacity (such as drunkenness); health hazards (such as untreated injuries and contagious illness)</p> <p>KB5. methods of accident prevention Methods of accident prevention: training in health and safety procedures; using health and safety procedures; use of equipment and working practices (such as safe carrying procedures); safety notices, advice; instruction from colleagues and supervisors</p> <p>KB6. safe working practices when working with tools and machines</p> <p>KB7. safe working practices while working at various hazardous sites</p> <p>KB8. where to find all the general health and safety equipment in the workplace</p> <p>KB9. various dangers associated with the use of electrical equipment</p> <p>KB10. preventative and remedial actions to be taken in the case of exposure to toxic materials Exposure: ingested, contact with skin, inhaled Preventative action: ventilation, masks, protective clothing/ equipment); Remedial action: immediate first aid, report to supervisor Toxic materials: solvents, flux, lead</p> <p>KB11. importance of using protective clothing/equipment while working</p> <p>KB12. precautionary activities to prevent the fire accident</p> <p>KB13. various causes of fire Causes of fires: heating of metal; spontaneous ignition; sparking; electrical heating; loose fires (smoking, welding, etc.); chemical fires; etc.</p> <p>KB14. techniques of using the different fire extinguishers</p> <p>KB15. different methods of extinguishing fire</p> <p>KB16. different materials used for extinguishing fire Materials: sand, water, foam, CO₂, dry powder</p> <p>KB17. rescue techniques applied during a fire hazard</p> <p>KB18. various types of safety signs and what they mean</p>

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	<p>KB19. appropriate basic first aid treatment relevant to the condition eg. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries</p> <p>KB20. content of written accident report</p> <p>KB21. potential injuries and ill health associated with incorrect manual handling</p> <p>KB22. safe lifting and carrying practices</p> <p>KB23. personal safety, health and dignity issues relating to the movement of a person by others</p> <p>KB24. potential impact to a person who is moved incorrectly</p>
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Reading and Writing Skills
	The user/individual on the job needs to know and understand how to:
	SA1. read and comprehend basic content to read labels, charts, signages
	SA2. read and comprehend basic English to read manuals of operations
	SA3. read and write an accident/incident report in local language or English
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to:
	SA4. question coworkers appropriately in order to clarify instructions and other issues
	SA5. give clear instructions to coworkers, subordinates others
	Decision Making
	The user/individual on the job needs to know and understand how to:
	SA6. make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines
B. Professional Skills	Plan and Organize
	The user/individual on the job needs to know and understand how to:
	SB1. plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	Working with others
	The user/individual on the job needs to know and understand how to:
	SB2. remain congenial while discussing and debating issues with co-workers
	SB3. follow appropriate protocols for communication based on situation, hierarchy, organizational culture and practice
	SB4. ask for, provide and receive required assistance where possible to ensure achievement of work related objectives
	SB5. thank coworkers for any assistance received
	SB6. offer appropriate respect based on mutuality and respect for fellow workmanship and authority

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	Problem Solving
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB7. think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s)</p> <p>SB8. identify immediate or temporary solutions to resolve delays</p> <p>SB9. identify sources of support that can be availed of for problem solving for various kind of problems</p> <p>SB10. seek appropriate assistance from other sources to resolve problems</p> <p>SB11. report problems that you cannot resolve to appropriate authority</p>
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB12. identify cause and effect relations in their area of work</p> <p>SB13. use cause and effect relations to anticipate potential problems and their solution</p>



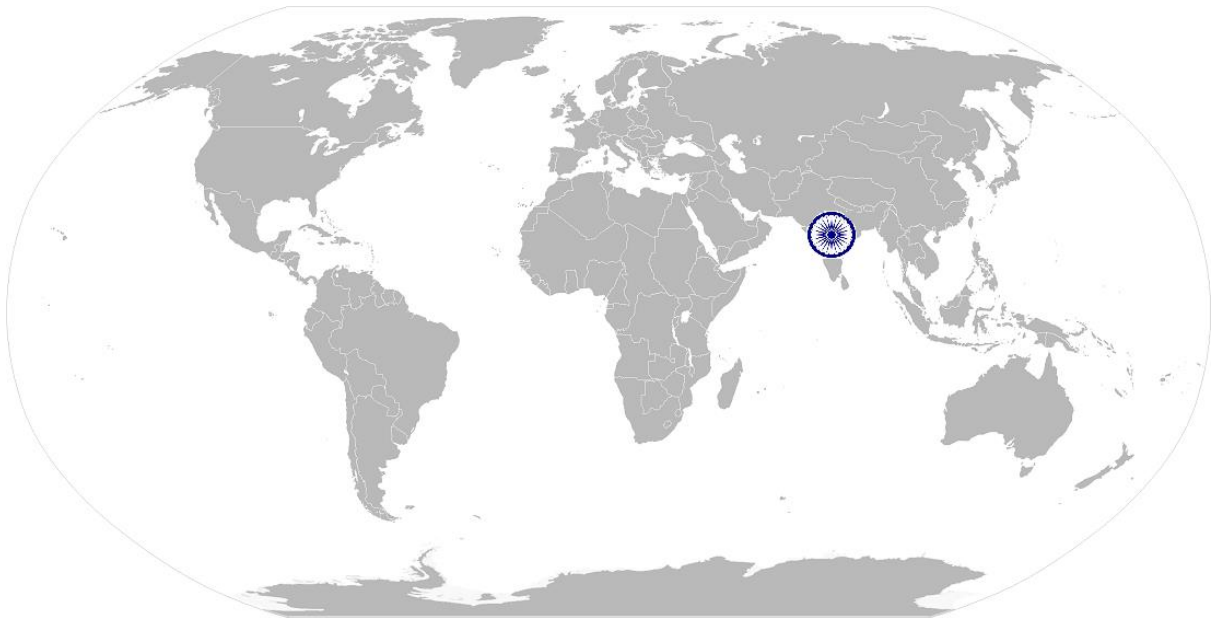
CSC/ N 1335: Use basic health and safety practices at the workplace

NOS Version Control

NOS Code	CSC / N 1335		
Credits (NSQF)	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/14
Industry Sub-sector	<ol style="list-style-type: none"> 1. Machine Tools 2. Dies, Moulds And Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Generation Machinery 7. Light Engineering Goods 	Last reviewed on	
		Next review date	30/08/16

CSC/ N 1336: Work effectively with others

National Occupational Standard



Overview

This unit covers basic practices that improve effectiveness of working with others in an organizational set-up.

CSC/ N 1336: Work effectively with others

Unit Code	CSC / N 1336
Unit Title (Task)	Work effectively with others
Description	<p>This unit covers basic etiquette and competencies that a candidate is required to possess and demonstrate in their behavior and interactions with others at the workplace.</p> <p>These cover areas such as communication etiquette, discipline, listening, handling conflict and grievances.</p>
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> Working with others
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Working with others	<p>The user/individual on the job should be able to:</p> <p>PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required</p> <p>PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt</p> <p>PC3. give information to others clearly, at a pace and in a manner that helps them to understand</p> <p>PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible</p> <p>PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks</p> <p>PC6. display appropriate communication etiquette while working</p> <p>Communication etiquette: do not use abusive language; use appropriate titles and terms of respect; do not eat or chew while talking (vice versa)etc.</p> <p>PC7. display active listening skills while interacting with others at work</p> <p>PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism</p> <p>PC9. demonstrate responsible and disciplined behaviors at the workplace</p> <p>Disciplined behaviors: e.g. punctuality; completing tasks as per given time and standards; not gossiping and idling time; eliminating waste, honesty, etc.</p> <p>PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions</p> <p>KA2. reporting structure, inter-dependent functions, lines and procedures in the work area</p> <p>KA3. relevant people and their responsibilities within the work area</p> <p>KA4. escalation matrix and procedures for reporting work and employment related issues</p>

CSC/ N 1336: Work effectively with others

**B. Technical
Knowledge**

The user/individual on the job needs to know and understand:

- KB1. various categories of people that one is required to communicate and co-ordinate with in the organization
- KB2. importance of effective communication in the workplace
- KB3. importance of teamwork in organizational and individual success
- KB4. various components of effective communication
- KB5. key elements of active listening
- KB6. value and importance of active listening and assertive communication
- KB7. barriers to effective communication
- KB8. importance of tone and pitch in effective communication
- KB9. importance of avoiding casual expletives and unpleasant terms while communicating professional circles
- KB10. how poor communication practices can disturb people, environment and cause problems for the employee, the employer and the customer
- KB11. importance of ethics for professional success
- KB12. importance of discipline for professional success
- KB13. what constitutes disciplined behavior for a working professional
- KB14. common reasons for interpersonal conflict
- KB15. importance of developing effective working relationships for professional success
- KB16. expressing and addressing grievances appropriately and effectively
- KB17. importance and ways of managing interpersonal conflict effectively

Skills (S) [Optional]



CSC/ N 1336: Work effectively with others

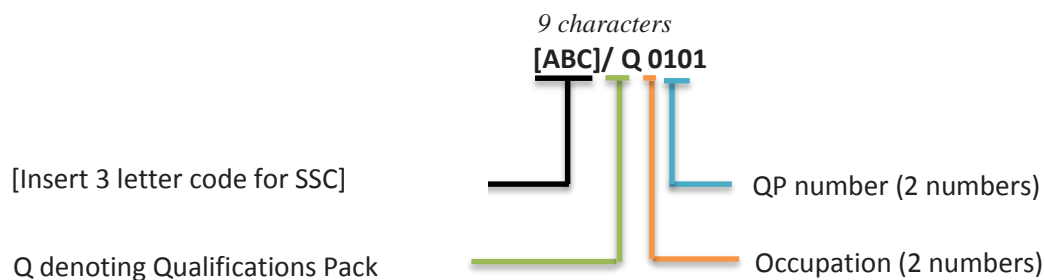
NOS Version Control

NOS Code	CSC / N 1336		
Credits(NSQF)	TBD	Version number	1.0
Industry	Capital Goods	Drafted on	10/04/14
Industry Sub-sector	1. Machine Tools 2. Dies, Moulds And Press Tools 3. Plastics Manufacturing Machinery 4. Textile Manufacturing Machinery 5. Process Plant Machinery 6. Electrical and Power Machinery 7. Light Engineering Goods	Last reviewed on	
		Next review date	30/08/16

Annexure

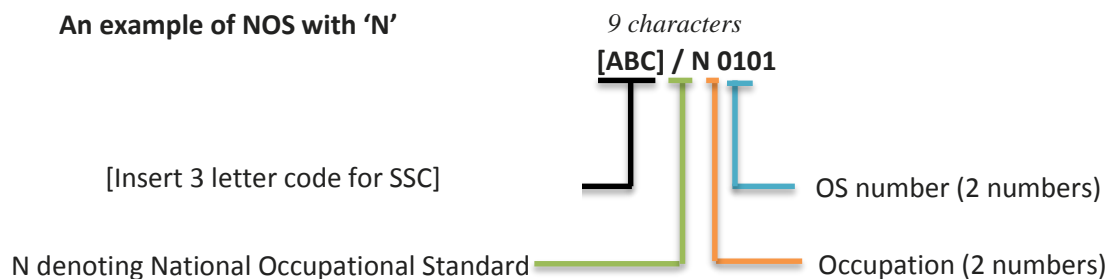
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with 'N'



The following acronyms/codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Machine Tools	01-13
Dies, Moulds and Press Tools	01-13
Plastics Manufacturing Machinery	01-13
Textile Manufacturing Machinery	01-13
Process Plant Machinery	01-13
Electrical and Power Machinery	01-13
Light Engineering Goods	01-13

Sequence	Description	Example
Three letters	Capital Goods	CSC
Slash	/	/
Next letter	Whether QP or NOS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

PERFORMANCE CRITERIA

Job Role: Draughtsman - Mechanical

Qualification Pack: CSC/ Q 0402

Sector Skill Council: Capital Goods Sector Skills Council

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Individual assessment agencies will create unique question papers for theory and skill practical part for each candidate at each examination/training center.
4. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessment Strategy Marks Allocation

NOS CODE	NOS TITLE	Weightage
CSC/ N 0402	Make or modify 2D mechanical engineering drawings using CAD system	70
CSC/ N 1335	Use basic health and safety practices at the workplace	20
CSC/ N 1336	Work effectively with others	10
		100

CSC/ N 0402	Make or modify 2D mechanical engineering drawings using CAD system		
Elements	Performance criteria	Theory	Practical
Preparing for 2D mechanical engineering drawings	PC1. use appropriate sources to obtain the technical information relevant to the drawing to be created	0	2
	PC2. identify design features, as appropriate to the drawing being produced	2	2
	PC3. ensure that the data and information received is complete and correct	0	2
	PC4. establish the drawing requirements from the data and information received	1	2
	PC5. report and rectify incorrect and inconsistent information in job specification documents as per organization procedures	1	2
	PC6. access and use the correct drawing software	1	1
	PC7. select drafting equipment appropriate to the drawing method chosen	1	2
	PC8. check that all the equipment is correctly connected and in a safe and usable working condition	0	1

	PC9. power up the equipment and activate the appropriate drawing software	0	1
		6	15

Performing set-up activities	PC10. customize system variables, menus and drawing defaults to produce the drawing to the appropriate scale	1	2
	PC11. develop macros as per approved procedures	2	2
	PC12. set up and check that all peripheral devices are connected and correctly operating and interface with ERP if required is available	0	2
	PC13. set the drawing datum at a convenient point	0	2
	PC14. set up drawing parameters (eg. layers, line types, color, text styles) to company procedures or to suit the drawing produced	1	2
		4	10

Make or modify 2D mechanical engineering drawings using CAD system	PC15. interpret and produce mechanical drawings, using first angle orthographic projections, isometric/oblique projections, third angle orthographic projections, sectional views	2	3
	PC16. apply drafting principles to produce various types of drawings that are consistent with applicable standards and procedures for use in various engineering activities	2	3
	PC17. create a drawing template to the required standards, which includes all necessary detail (eg.) using various drawing tools	2	3
	PC18. use appropriate terminologies and techniques to create drawings, in the required formats, that are sufficiently and clearly detailed	2	2
	PC19. use keyboard command and pull down menus available in common CAD systems	1	1
	PC20. use codes and other references that follow the required conventions	1	2
	PC21. draw temporary fasteners and rivets	1	2
	PC22. draw components details and assembly drawings	1	3
	PC23. draw piping layouts, gears and machine foundation or base	1	3
	PC24. draw working drawings of jigs and fixtures	1	3
	PC25. draw detailed drawings of dies, moulds and press tools	1	3
	PC26. dimension and label the drawing as per approved procedures	1	3

	PC27. create detailed views using various scales to meet job requirements	1	2
	PC28. ensure that drawings are checked and approved by the appropriate person	0	1
	PC29. produce hard copies of the finished drawings	0	1
	PC30. check that the drawing is correctly titled and referenced; sawing is correctly titled and referenced	0	2
	PC31. save the drawing to an appropriate storage medium (eg. hard drive, CD/DVD, external storage device)	0	1
	PC32. create a separate backup copy and place it in safe storage	0	1
	PC33. identify component parts list with part name, description of part, material specification or part number, quantities and other details to prepare bill of materials as per organizational guidelines	2	2
	PC34. deal promptly and effectively with problems within control and seek help and guidance from the relevant people if you have problems that they cannot resolve	0	2
	PC35. ensure that changes are completed as required by organizational procedures	1	1
	PC36. shut down the CAD system to a safe condition on completion of the drawing activities	0	1
		20	45
		30	70
		100	

CSC/ N 1335		Use basic health and safety practices at the workplace	
Elements	Performance criteria	Theory	Practical
Health and safety	PC1. use protective clothing/equipment for specific tasks and work conditions	2	3
	PC2. state the name and location of people responsible for health and safety in the workplace	1	2
	PC3. state the names and location of documents that refer to health and safety in the workplace	1	2
	PC4. identify job-site hazardous work and state possible causes of risk or accident in the workplace	2	3
	PC5. carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role	2	2
	PC6. state location of general health and safety equipment in the workplace	2	1
	PC7. inspect for faults, set up and safely use steps and ladders in general use	2	3
	PC8. work safely in and around trenches, elevated places and confined areas	2	3
	PC9. lift heavy objects safely using correct procedures	2	3
	PC10. apply good housekeeping practices at all times	2	2
	PC11. identify common hazard signs displayed in various areas	2	3
	PC12. retrieve and/or point out documents that refer to health and safety in the workplace	1	2
		21	29
Fire safety	PC13. use the various appropriate fire extinguishers on different types of fires correctly	1	3
	PC14. demonstrate rescue techniques applied during fire hazard	1	3
	PC15. demonstrate good housekeeping in order to prevent fire hazards	1	2
	PC16. demonstrate the correct use of a fire extinguisher	1	3
		4	11
Emergencies, rescue and first-aid procedures	PC17. demonstrate how to free a person from electrocution	1	3
	PC18. administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.	1	3
	PC19. demonstrate basic techniques of bandaging	1	2

	PC20. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments	1	3
	PC21. perform and organize loss minimization or rescue activity during an accident in real or simulated environments	1	2
	PC22. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases	1	2
	PC23. demonstrate the artificial respiration and the CPR Process	1	2
	PC24. participate in emergency procedures	2	1
	PC25. complete a written accident/incident report or dictate a report to another person, and send report to person responsible	1	3
	PC26. demonstrate correct method to move injured people and others during an emergency	1	3
		11	24
		36	64
		100	

CSC/ N 1336	Work effectively with others		
Elements	Performance criteria	Theory	Practical
Work effectively with others	PC1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	3	7
	PC2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt	3	7
	PC3. give information to others clearly, at a pace and in a manner that helps them to understand	3	7
	PC4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible	3	7
	PC5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks	3	7
	PC6. display appropriate communication etiquette while working	3	7
	PC7. display active listening skills while interacting with others at work	3	7
	PC8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism	3	7
	PC9. demonstrate responsible and disciplined behaviors at the workplace	3	7
	PC10. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict	3	7
		30	70
		100	