



Automotive CAD Technician

QP Code: ASC/Q8201

Version: 2.0

NSQF Level: 4

Automotive Skills Development Council || 153, Gr Floor, Okhla Industrial Area, Phase - III, Leela Building
New Delhi - 110020

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ASC/Q8201: Automotive CAD Technician

Brief Job Description

The individual is involved in interpreting the customer /design team requirements of the product and creating the same into 3D and 2D graphical model through various computer aided design techniques.

Personal Attributes

The person should be patient, organised, team-oriented and have the ability to work for long hours in adverse conditions. They should be keen observers and have an eye for detail and quality.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [ASC/N9803: Organize work and resources \(Manufacturing\)](#)
2. [ASC/N9802: Interact effectively with colleagues, customers and others](#)
3. [ASC/N8201: Create design of component/ aggregate](#)

Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	Research & Development
Occupation	Automotive Product Designing
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3118.0301
Minimum Educational Qualification & Experience	10th Class + 2 years I.T.I (Fitter/Draughtsman (Mechanical)) OR 12th Class Pass with 1 year relevant experience OR 3 years Diploma (Mechanical/Automobile) from recognized regulatory body after Class 10 th

<p>Minimum Level of Education for Training in School</p>	
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Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	30/09/2021
Next Review Date	30/09/2024
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ASC/N9803: Organize work and resources (Manufacturing)

Description

This NOS unit is about implementing safety, planning work, adopting sustainable practices for optimising use of resources

Scope

The scope covers the following :

- Maintain safe and secure working environment
- Health and hygiene
- Perform work as per quality standards
- Effective waste management practices
- Material/energy conservation practices

Elements and Performance Criteria

Maintain safe and secure working environment

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

- PC1. identify hazardous activities and the possible causes of risks or accidents in the workplace
- PC2. follow safe working practices while dealing with hazards to ensure safety of self and others
- PC3. carry out routine check of the machine for identifying potential hazards
- PC4. use appropriate protective clothing/equipment for specific tasks and work
- PC5. follow safety hazards and preventive techniques during fire drill
- PC6. report any identified breaches in health, safety and security policies and procedures to the designated person

Health and hygiene

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

- PC7. ensure workstation and equipment are regularly clean and sanitized
- PC8. clean hands with soap, alcohol-based sanitizer regularly
- PC9. avoid contact with ill people and self-isolate in a similar situation
- PC10. wear and dispose PPEs regularly and appropriately
- PC11. report advanced hygiene and sanitation issues to appropriate authority
- PC12. follow stress and anxiety management techniques

Perform work as per quality standards

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

- PC13. ensure that work is accomplished as per the requirements within the specified timeline
- PC14. ensure team goals are given preference over individual goals

Effective waste management practices

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

- PC15. follow the fundamentals of 5S for waste management
- PC16. segregate waste into different categories

- PC17. follow processes specified for disposal of hazardous waste
- PC18. identify recyclable, non-recyclable and hazardous waste
- PC19. dispose non-recyclable, recyclable and reusable waste appropriately at identified location

Material/energy conservation practices

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

- PC20. identify ways to optimize usage of material in various tasks/activities/processes
- PC21. check for spills/leakages in various tasks/activities/processes
- PC22. plug spills/leakages and escalate to appropriate authority if unable to rectify
- PC23. check if the equipment/machine is functioning normally before commencing work and rectify wherever required
- PC24. report malfunctioning (fumes/ sparks/emission/vibration/noise) and lapse in maintenance of equipment
- PC25. ensure electrical equipment and appliances are properly connected and turned off when not in use

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. organisation procedures for health, safety and security, individual role and responsibilities in this context
- KU2. the organisation's emergency procedures for different emergency situations and the importance of following the same
- KU3. evacuation procedures for workers and visitors
- KU4. how and when to report hazards as well as the limits of responsibility for dealing with hazards
- KU5. potential hazards, risks and threats based on the nature of work
- KU6. preventative and remedial actions to be taken in case of exposure to toxic material
- KU7. various types of fire extinguisher
- KU8. various types of safety signs and their meaning
- KU9. appropriate first aid treatment relevant to different condition e.g. bleeding, minor burns, eye injuries etc.
- KU10. relevant standards, procedures and policies related to 5S followed in the company
- KU11. the various materials used and their storage norms
- KU12. efficient utilisation of material and water
- KU13. basics of electricity and prevalent energy efficient devices
- KU14. common practices of conserving electricity
- KU15. common sources and ways to minimize pollution
- KU16. categorisation of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics
- KU17. usage of different colors of dustbins
- KU18. waste management techniques
- KU19. significance of greening

Generic Skills (GS)

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

- GS1. read safety instructions/guidelines
- GS2. modify work practices to improve them
- GS3. ask for clarifications from superior about the job requirement
- GS4. work with supervisors/team members to carry out work related tasks
- GS5. complete tasks efficiently and accurately within stipulated time
- GS6. inform/report to concerned person in case of any problem
- GS7. make timely decisions for efficient utilization of resources
- GS8. write reports such as accident report, in at least English/regional language
- GS9. be punctual and utilize time efficiently

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintain safe and secure working environment</i>	11	5	-	7
PC1. identify hazardous activities and the possible causes of risks or accidents in the workplace	2	1	-	2
PC2. follow safe working practices while dealing with hazards to ensure safety of self and others	2	-	-	1
PC3. carry out routine check of the machine for identifying potential hazards	2	1	-	1
PC4. use appropriate protective clothing/equipment for specific tasks and work	2	1	-	1
PC5. follow safety hazards and preventive techniques during fire drill	2	1	-	1
PC6. report any identified breaches in health, safety and security policies and procedures to the designated person	1	1	-	1
<i>Health and hygiene</i>	7	5	-	2
PC7. ensure workstation and equipment are regularly clean and sanitized	2	2	-	1
PC8. clean hands with soap, alcohol-based sanitizer regularly	1	1	-	1
PC9. avoid contact with ill people and self-isolate in a similar situation	1	-	-	-
PC10. wear and dispose PPEs regularly and appropriately	1	-	-	-
PC11. report advanced hygiene and sanitation issues to appropriate authority	1	1	-	-
PC12. follow stress and anxiety management techniques	1	1	-	-
<i>Perform work as per quality standards</i>	5	3	-	2
PC13. ensure that work is accomplished as per the requirements within the specified timeline	2	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. ensure team goals are given preference over individual goals	3	1	-	1
<i>Effective waste management practices</i>	15	10	-	4
PC15. follow the fundamentals of 5S for waste management	3	2	-	1
PC16. segregate waste into different categories	2	1	-	-
PC17. follow processes specified for disposal of hazardous waste	2	2	-	1
PC18. identify recyclable, non-recyclable and hazardous waste	4	2	-	1
PC19. dispose non-recyclable, recyclable and reusable waste appropriately at identified location	4	3	-	1
<i>Material/energy conservation practices</i>	12	7	-	5
PC20. identify ways to optimize usage of material in various tasks/activities/processes	2	1	-	1
PC21. check for spills/leakages in various tasks/activities/processes	2	1	-	1
PC22. plug spills/leakages and escalate to appropriate authority if unable to rectify	2	1	-	-
PC23. check if the equipment/machine is functioning normally before commencing work and rectify wherever required	2	2	-	1
PC24. report malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment	2	1	-	1
PC25. ensure electrical equipment and appliances are properly connected and turned off when not in use	2	1	-	1
NOS Total	50	30	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9803
NOS Name	Organize work and resources (Manufacturing)
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed On	30/09/2021
Next Review Date	30/09/2024
NSQC Approval Date	30/09/2021

ASC/N9802: Interact effectively with colleagues, customers and others

Description

This NOS unit is about communicating with customers and colleagues/superiors, either in own work group or in other work groups within organisation.

Scope

The scope covers the following :

- Communicate effectively with colleagues, customers and others
- Interact with supervisor or superior

Elements and Performance Criteria

Communicate effectively with colleagues, customers and others

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

- PC1. maintain clear communication with colleagues, customers and others, wherever needed, through all means i.e. face-to-face, telephonic or written
- PC2. adjust communication styles to reflect gender and persons with disability (PWD) sensitivity
- PC3. work in a way that shows respect for colleagues and others
- PC4. follow the organisation's policies and procedures while working in a team
- PC5. respect personal space of colleagues and customers

Interact with supervisor or superior

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

- PC6. identify work requirements by receiving instructions from reporting supervisor
- PC7. escalate problems to supervisors that cannot be handled including repairs and maintenance of machine
- PC8. report the completed work
- PC9. rectify errors as per feedback

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. the importance of effective communication and establishing good working relationships with colleagues and supervisor
- KU2. different methods of communication as per the circumstances
- KU3. gender based concepts, issues and legislation

Generic Skills (GS)

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

- GS1. read instructions/guidelines/procedures

- GS2. listen effectively and orally communicate information
- GS3. ask for clarification and advice from the concerned person
- GS4. maintain positive and effective relationships with colleagues and customers
- GS5. evaluate the possible solution(s) to the problem
- GS6. deliver consistent and reliable service to customers
- GS7. complete written work with attention to detail
- GS8. check that the work meets customer requirements

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Communicate effectively with colleagues, customers and others</i>	36	11	-	14
PC1. maintain clear communication with colleagues, customers and others, wherever needed, through all means i.e. face-to-face, telephonic or written	8	-	-	4
PC2. adjust communication styles to reflect gender and persons with disability (PwD) sensitivity	8	-	-	-
PC3. work in a way that shows respect for colleagues and others	7	4	-	3
PC4. follow the organisation's policies and procedures while working in a team	7	4	-	3
PC5. respect personal space of colleagues and customers	6	3	-	4
<i>Interact with supervisor or superior</i>	14	19	-	6
PC6. identify work requirements by receiving instructions from reporting supervisor	7	4	-	-
PC7. escalate problems to supervisors that cannot be handled including repairs and maintenance of machine	-	5	-	3
PC8. report the completed work	7	5	-	-
PC9. rectify errors as per feedback	-	5	-	3
NOS Total	50	30	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9802
NOS Name	Interact effectively with colleagues, customers and others
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed On	30/09/2021
Next Review Date	30/09/2024
NSQC Approval Date	30/09/2021

ASC/N8201: Create design of component/ aggregate

Description

This NOS is about interpreting the customer and internal product design requirements and creating the design of components by using appropriate computer graphic techniques

Scope

The scope covers the following :

- Prepare for product designing
- Perform designing of the component
- Inspection and storage of design

Elements and Performance Criteria

Prepare for product designing

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

- PC1. identify the customer requirements and work to be done by interpreting the work order, process manuals and instructions from internal design team and supervisor
- PC2. identify and select software like CATIA, Auto- CAD, Unigraphics etc. for creating the designs and models as per the requirement
- PC3. collate the design requirements in terms of material used for making the component, packaging and other requirements to decide the dimensions, measurements and tolerances of the aggregate/component
- PC4. refer any issues related to design concept clarity, dimensions and practicality to competent internal specialist or supervisor if they cannot be resolved by own

Perform designing of the component

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

- PC5. prepare a rough sketch of the end product by visualizing the requirements of the customer
- PC6. develop and design specifications of the component by using the Geometric and Trigonometric rules/ formula provided by the supervisor
- PC7. set the required unit and dimension parameters and insert sketches, scanned images, diagrams, signs or symbols, etc. of required product design in a CAD file
- PC8. create a 3D model of product by using CAD techniques as per the information received from the customer
- PC9. prepare layouts and various views of drawing to generate a relationship between components and assemblies
- PC10. apply different drawing/ drafting aids like colours, symbols etc. to highlight areas in the drawings
- PC11. test the 3D model through simulation/ packaging study on the feasibility of actual product as per the customer requirement
- PC12. create 2D drawing of the component as per the SOP/WI
- PC13. make accurate and complete notes related to design in terms of overall dimensions or other manufacturing specifications like assembly sequence etc. in the drawing

PC14. maintain CAD files, backup of CAD files and records of other related information shared by internal team or customer

Inspection and storage of design

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

PC15. co-ordinate with product design team and other departments for design review and their feedback on the correctness and validity of the drawing for production purpose

PC16. conduct quality inspection of the drawings and sketches for various tolerances levels

PC17. rework or modify the design as per the feedback shared by the product design team on the 2D drawings

PC18. tag and store the drawings with the right numbers and codes properly as per the organisational guidelines

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant standards and procedures followed in the company

KU2. various requirements in terms of design and utility of the component

KU3. internal systems of design records (Manual /PLM), Change notes (ECN)

KU4. different types of designing processes and associated software like CATIA, AutoCAD, Unigraphics etc.

KU5. Draughting Standards & Techniques- e.g. ANSI series IS/ ISO

KU6. technical drawing practices as per the company standards

KU7. drawings and modelling techniques like 2D and 3D

KU8. different type of views generated in engineering drawings

KU9. computer programming and drafting

KU10. Limits & Fits, GD & T etc.

KU11. algebra and trigonometric rules and applications

KU12. how to interpret Tolerance Analysis sheet supplied by the design team

KU13. how to check various dimensional mismatches which may happen on the actual product assembly

Generic Skills (GS)

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

GS1. read and interpret notes, designs and instructions shared by different internal team

GS2. communicate the process requirements to the supervisor and co-workers

GS3. attentively listen and comprehend the information given by the supervisor/team members

GS4. write work related information in English/regional language

GS5. recognise a workplace problem and take suitable action

GS6. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS7. plan and organise work according to the work requirements

- GS8. complete the assigned tasks with minimum supervision
- GS9. visualize designs
- GS10. share technical information clearly using appropriate language

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare for product designing</i>	8	10	-	4
PC1. identify the customer requirements and work to be done by interpreting the work order, process manuals and instructions from internal design team and supervisor	2	2	-	1
PC2. identify and select software like CATIA, Auto-CAD, Unigraphics etc. for creating the designs and models as per the requirement	2	2	-	1
PC3. collate the design requirements in terms of material used for making the component, packaging and other requirements to decide the dimensions, measurements and tolerances of the aggregate/component	2	3	-	1
PC4. refer any issues related to design concept clarity, dimensions and practicality to competent internal specialist or supervisor if they cannot be resolved by own	2	3	-	1
<i>Perform designing of the component</i>	16	36	-	12
PC5. prepare a rough sketch of the end product by visualizing the requirements of the customer	2	2	-	1
PC6. develop and design specifications of the component by using the Geometric and Trigonometric rules/ formula provided by the supervisor	1	4	-	1
PC7. set the required unit and dimension parameters and insert sketches, scanned images, diagrams, signs or symbols, etc. of required product design in a CAD file	1	5	-	1
PC8. create a 3D model of product by using CAD techniques as per the information received from the customer	2	5	-	1
PC9. prepare layouts and various views of drawing to generate a relationship between components and assemblies	1	4	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. apply different drawing/ drafting aids like colours, symbols etc. to highlight areas in the drawings	2	4	-	1
PC11. test the 3D model through simulation/ packaging study on the feasibility of actual product as per the customer requirement	2	5	-	2
PC12. create 2D drawing of the component as per the SOP/WI	1	3	-	2
PC13. make accurate and complete notes related to design in terms of overall dimensions or other manufacturing specifications like assembly sequence etc. in the drawing	2	2	-	1
PC14. maintain CAD files, backup of CAD files and records of other related information shared by internal team or customer	2	2	-	1
<i>Inspection and storage of design</i>	6	4	-	4
PC15. co-ordinate with product design team and other departments for design review and their feedback on the correctness and validity of the drawing for production purpose	2	1	-	1
PC16. conduct quality inspection of the drawings and sketches for various tolerances levels	2	1	-	1
PC17. rework or modify the design as per the feedback shared by the product design team on the 2D drawings	1	1	-	1
PC18. tag and store the drawings with the right numbers and codes properly as per the organisational guidelines	1	1	-	1
NOS Total	30	50	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N8201
NOS Name	Create design of component/ aggregate
Sector	Automotive
Sub-Sector	Research & Development
Occupation	Automotive Product Designing
NSQF Level	4
Credits	TBD
Version	2.0
Last Reviewed On	30/09/2021
Next Review Date	30/09/2024
NSQC Approval Date	30/09/2021

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

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 the proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on the knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for the theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
6. 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 NSQC Approved | |Automotive Skills Development Council

successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N9803.Organize work and resources (Manufacturing)	50	30	-	20	100	15
ASC/N9802.Interact effectively with colleagues, customers and others	50	30	-	20	100	10
ASC/N8201.Create design of component/ aggregate	30	50	-	20	100	75
Total	130	110	-	60	300	100

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
PPE	Personal Protective Equipment
PwD	Person with Disability
SOP	Standard Operating Practices
PwD	Persons with Disability

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.