सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

Qualification Pack

Product Design Engineer

QP Code: ASC/Q8102

Version: 1.0

NSQF Level: 6

Automotive Skills Development Council || Automotive Skills Development Council,Sat Paul Mittal Building,1/6, Siri Institutional Area
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Contents

ASC/Q8102: Product Design Engineer

Brief Job Description

Product Design Engineer is broadly responsible designing the product using CAD & CAE systems by understanding all the product requirements. The role is also responsible for supporting the manager in ensuring that the designed product includes aspects related to telematics, human machine interface ,ergonomics and design FMEA.

Personal Attributes

The individual should have ability to visualise the product creatively and innovatively design the same. The individual should further have analytical skills, out of box thinking, problem solving, judgement, decision making, skills etc. and awareness about global and latest trends in the automotive design area with knowledge of material used in the design and technology as well.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. ASC/N0006: Maintain a safe and healthy working environment
2. ASC/N0022: Ensure implementation of 5S activities at the shop floor & the office area
3. ASC/N8102: Understanding the product requirements, support the manager in finalising the design specifications and reliability parameters of the product
4. ASC/N8103: Designing of vehicles using computer aided technology
5. ASC/N8104: Managing the product data and system integration mechanism

Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	Research & Development
Occupation	Product design
Country	India
NSQF Level	6
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2144.0803

Minimum Educational Qualification & Experience	B.E./B.Tech (Preferably automobile/ mechanical engineering) with 2-3 years of experience R&D automobile product design
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	FMEA (Failure Mode Effect Analysis) Latest trends in the automotive industry Training on ergonomics Problem solving Design Tools Design Softwares as applicable by the company
Minimum Job Entry Age	18 Years
Last Reviewed On	20/01/2014
Next Review Date	30/06/2020
Deactivation Date	30/06/2020
NSQC Approval Date	05/08/2015
Version	1.0

ASC/N0006: Maintain a safe and healthy working environment

Description

This NOS is about creating a Safe and Healthy work place, adhering to the safety guidelines in the working area, following practices which are not impacting the environment in a negative manner and training team members on health and safety related issues

Scope

The role holder will be responsible for identifying and reporting of risks creating and sustaining a safe, clean and environment friendly work place This NOS will be applicable to all Automotive sector manufacturing job roles

Elements and Performance Criteria

Identify and report the risks identified

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

PC1.. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise

PC2. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc

PC3. Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations

PC4. Create awareness amongst other by sharing information on the identified risks

Create and sustain a Safe, clean and environment friendly work place

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

PC5.. Follow the instructions given on the equipment manual describing the operating process of the equipments

PC6.. Follow the Safety, Health and Environment related practices developed by the organization

PC7. Operate the machine using the recommended Personal Protective Equipments (PPE)

PC8. . Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc

PC9. Maintain high standards of personal hygiene at the work place

PC10. Ensure that the waste disposal is done in the designated area and manner as per organization SOP.

PC11. Inform appropriately the medical officer/ HR in case of self or an employees illness of contagious nature so that preventive actions can be planned for others

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant standards, procedures and policies related to Health, Safety and Environment followed in the company

KU2. basic knowledge of Safety procedures(fire fighting, first aid) within the organization

KU3. knowledge of various types of PPEs and their usage

KU4. basic knowledge of risks/hazards associated with each occupation in the organization

KU5. how to safely operate various tools and machines and risksassociated with the tools/ equipment

KU6. knowledge of personal hygiene and how an individual an contribute towards creating a highly safe and clean working environment

Generic Skills (GS)

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

GS1. write basic level notes and observations

GS2. read safety instructions put up across the plant premises

GS3. read safety precautions mentioned in equipment manuals and panels to understand the potential risks associated

GS4. effectively communicate information to team members

GS5. informemployees in the plant and concerned functions about events, incidents & potential risks observed related to Safety, Health and Environment.

GS6. question operator/ supervisor in order to understand the safety related issues

GS7. attentively listen with full attention and comprehend the information given by the speaker during safety drills and training programs

GS8. use common sense and make judgments during day to day basis

GS9. use reasoning skills to identify and resolve basic problems

GS10. use common sense and make judgments during day to day basis

GS11. use reasoning skills to identify and resolve basic problems

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Identify and report the risks identified	**8**	**23**	**-**	**-**
PC1.. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise	3	6	-	-
PC2. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc	2	6	-	-
PC3. Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations	2	6	-	-
PC4. Create awareness amongst other by sharing information on the identified risks	1	5	-	-
Create and sustain a Safe, clean and environment friendly work place	**17**	**52**	**-**	**-**
PC5.. Follow the instructions given on the equipment manual describing the operating process of the equipments	3	7	-	-
PC6.. Follow the Safety, Health and Environment related practices developed by the organization	3	8	-	-
PC7. Operate the machine using the recommended Personal Protective Equipments (PPE)	3	8	-	-
PC8. . Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc	2	8	-	-
PC9. Maintain high standards of personal hygiene at the work place	2	7	-	-
PC10. Ensure that the waste disposal is done in the designated area and manner as per organization SOP.	3	8	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. Inform appropriately the medical officer/ HR in case of self or an employees illness of contagious nature so that preventive actions can be planned for others	1	6	-	-
NOS Total	**25**	**75**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N0006
NOS Name	Maintain a safe and healthy working environment
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Maintenance
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	15/09/2013
Next Review Date	15/09/2015
NSQC Clearance Date	20/07/2015

ASC/N0022: Ensure implementation of 5S activities at the shop floor & the office area

Description

This NOS is about overseeing the implementation of all 5 S activities both at the shop floor and the office area by the team members and training the team in implementation of the 5S principles

Scope

The individual needs to Ensure sorting, streamlining/ organizing, storage and documentation, systematic cleaning, standardization and sustenance across the plant and office premises of the organization as given in the organization guidelines

Elements and Performance Criteria

Ensure proper sorting of items at the work place

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

PC1.. ensure all recyclable materials are put in designated containers

PC2. ensure no tools, fixtures & jigs are lying on workstations unless in use and no un-necessary items is lying on workbenches or work surfaces unless in use

PC3. ensure that the operators and other team members are segregating the waste in hazardous/ non hazardous waste as per the sorting work instructions

PC4. ensure that all the operators are following the technique of waste disposal and waste storage in the designated bins

PC5.. segregate the items which are labelled at red tag items for the process area and keep them in the correct places

PC6.. ensure that all the tools/ equipment/ fasteners/ spare parts are arranged as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5s guidelines/ work instructions

PC7. check for return of any type of extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area

PC8. . oversee removal of unnecessary equipment, storage, furniture, unneeded inventory, supplies, parts and material

PC9. ensure that areas of material storage areas are not overflowing

PC10. ensure proper stacking and storage of the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required

Ensure proper documentation and storage - streamlining & organizing the workplace

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

PC11. ensure that the team follows the given instructions and checks for labelling of fluids, oils lubricants, solvents, chemicals etc and proper storage of the same to avoid spillage, leakage, fire etc

PC12. make sure that all material and tools are stored in the designated places and in the manner indicated in the 5s instructions

PC13. ensure that organizing the workplace takes place with due considerations to the principles of wasted motions, ergonomics, work & method study .

Ensure cleaning of self and the work place

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

PC14. ensure that the area has floors swept, machinery clean and is generally neat and tidy in case of cleaning, ensure that correct displays are maintained on the floor which indicate potential safety hazards

PC15.. ensure workbenches and work surfaces are clean and in good condition

PC16.. ensure adherence to the cleaning schedule for the lighting system to ensure proper illumination

PC17.. ensure all recyclable materials are put in designated containers

Ensure standardization

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

PC18. ensure that daily cleaning standards and schedules to create a clean working environment are followed across the plant

PC19.. ensure all recyclable materials are put in designated containers

PC20. . ensure logical and user friendly documentation and file management for all activities across the plant and create guidelines around standardization of processes

PC21. ensure timely creation and sharing of the 5s checklists

PC22. ensure that the 5s manual are available as per the timelines

Ensure sustenance

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

PC23. ensure team cooperation during the audit of 5 s activities

PC24. ensure that workmen are periodically trained to address challenges related to 5s

PC25.. participate actively in employee work groups on 5s and encourage team members for active participation

PC26.. oversee that the staff/operators are trained and fully understand 5s procedures

PC27. . ensure that all the guidelines for what to do and what not to do to build sustainability in 5s are mentioned in the 5s check lists/ work instructions and are easily searchable

PC28. ensure continuous training of the team members on 5s in order to increase their awareness and support implementation

PC29. ensure that all visual controls, notice boards, symbols etc at the manufacturing place are created, working and are put up as per the requirement

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant standards, procedures and policies related to 5Sfollowed in the company

KU2. have basic knowledge of 5S procedures

KU3. know various types 5s practices followed in various areas

KU4. understand the 5S checklists provided in the department/ team

KU5. have skills to identify useful & non useful items

KU6. have knowledge of labels , signs & colours used as indicators
KU7. Have knowledge on how to sort and store various types of tools,equipment, material etc
KU8. know , how to identify various types of waste products
KU9. understand the impact of waste/ dirt/ dust/unwantedsubstances on the process/ environment/ machinery/ humanbody
KU10. have knowledge of best and environment protective ways ofcleaning & waste disposal
KU11. understand the importance of standardization in processes
KU12. understand the importance of sustainability in 5S
KU13. have knowledge of TQM process
KU14. have knowledge of various materials and storage norms
KU15. understand visual controls, symbols, graphs etc

Generic Skills (GS)

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

GS1. write basic level notes and observations
GS2. note down observations (if any) related to the process
GS3. write information documents to internal departments/ internal teams
GS4. read 5S instructions put up across the plant premises
GS5. effectively communicate information to team members inform employees in the plant and concerned functions about 5S
GS6. question the process head in order to understand the 5S related issues
GS7. attentively listen with full attention and comprehend the information given by the speaker during 5S training programs
GS8. use common sense and make judgments during day to day basis
GS9. use reasoning skills to identify and resolve basic problems using 5S
GS10. persuade team members to follow 5 S
GS11. ensure that the team members understand the importance of using 5 S tool
GS12. use innovative skills to perform and manage 5 S activities at the work desk and the shop floor
GS13. exhibit inquisitive behaviour to seek feedback and question on the existing set patterns of work emerge, techniques in CA/CI around 5 S work practices
GS14. do what is right, not what is a popular practice
GS15. follow shop floor rules& regulations and avoid deviations
GS16. lead by example in the plant premises while performing activities related to 5S
GS17. ensure self-cleanliness on a daily basis
GS18. demonstrate the will to keep the work area in a clean and orderly manner
GS19. accept additional responsibility for self and the team
GS20. encourage self and other to take greater responsibilities for managing 5S
GS21. identify obstacles and bottlenecks in the process and find basic level solutions for removing these obstacles

GS22. use previous experience in resolving problems and taking decisions

GS23. make timely and independent decisions on the line/ shift within the boundaries of the delegation matrix of the organization

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Ensure proper sorting of items at the work place	**10**	**25**	**-**	**-**
PC1.. ensure all recyclable materials are put in designated containers	1	2.5	-	-
PC2. ensure no tools, fixtures & jigs are lying on workstations unless in use and no un-necessary items is lying on workbenches or work surfaces unless in use	1	2.5	-	-
PC3. ensure that the operators and other team members are segregating the waste in hazardous/ non hazardous waste as per the sorting work instructions	1	2.5	-	-
PC4. ensure that all the operators are following the technique of waste disposal and waste storage in the designated bins	1	2.5	-	-
PC5.. segregate the items which are labelled at red tag items for the process area and keep them in the correct places	1	2.5	-	-
PC6.. ensure that all the tools/ equipment/ fasteners/ spare parts are arranged as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5s guidelines/ work instructions	1	2.5	-	-
PC7. check for return of any type of extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area	1	2.5	-	-
PC8. . oversee removal of unnecessary equipment, storage, furniture, unneeded inventory, supplies, parts and material	1	2.5	-	-
PC9. ensure that areas of material storage areas are not overflowing	1	2.5	-	-
PC10. ensure proper stacking and storage of the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required	1	2.5	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Ensure proper documentation and storage - streamlining & organizing the workplace	**3**	**7.5**	**-**	**-**
PC11. ensure that the team follows the given instructions and checks for labelling of fluids, oils lubricants, solvents, chemicals etc and proper storage of the same to avoid spillage, leakage, fire etc	1	2.5	-	-
PC12. make sure that all material and tools are stored in the designated places and in the manner indicated in the 5s instructions	1	2.5	-	-
PC13. ensure that organizing the workplace takes place with due considerations to the principles of wasted motions, ergonomics, work & method study .	1	2.5	-	-
Ensure cleaning of self and the work place	**4**	**10**	**-**	**-**
PC14. ensure that the area has floors swept, machinery clean and is generally neat and tidy in case of cleaning, ensure that correct displays are maintained on the floor which indicate potential safety hazards	1	2.5	-	-
PC15.. ensure workbenches and work surfaces are clean and in good condition	1	2.5	-	-
PC16.. ensure adherence to the cleaning schedule for the lighting system to ensure proper illumination	1	2.5	-	-
PC17.. ensure all recyclable materials are put in designated containers	1	2.5	-	-
Ensure standardization	**5**	**12.5**	**-**	**-**
PC18. ensure that daily cleaning standards and schedules to create a clean working environment are followed across the plant	1	2.5	-	-
PC19.. ensure all recyclable materials are put in designated containers	1	2.5	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. . ensure logical and user friendly documentation and file management for all activities across the plant and create guidelines around standardization of processes	1	2.5	-	-
PC21. ensure timely creation and sharing of the 5s checklists	1	2.5	-	-
PC22. ensure that the 5s manual are available as per the timelines	1	2.5	-	-
Ensure sustenance	**7**	**16**	**-**	**-**
PC23. ensure team cooperation during the audit of 5 s activities	1	2.5	-	-
PC24. ensure that workmen are periodically trained to address challenges related to 5s	1	2.5	-	-
PC25.. participate actively in employee work groups on 5s and encourage team members for active participation	1	2	-	-
PC26.. oversee that the staff/operators are trained and fully understand 5s procedures	1	2	-	-
PC27. . ensure that all the guidelines for what to do and what not to do to build sustainability in 5s are mentioned in the 5s check lists/ work instructions and are easily searchable	1	2.5	-	-
PC28. ensure continuous training of the team members on 5s in order to increase their awareness and support implementation	1	2	-	-
PC29. ensure that all visual controls, notice boards, symbols etc at the manufacturing place are created, working and are put up as per the requirement	1	2.5	-	-
NOS Total	**29**	**71**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N0022
NOS Name	Ensure implementation of 5S activities at the shop floor & the office area
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	15/03/2014
Next Review Date	15/03/2016
NSQC Clearance Date	

ASC/N8102: Understanding the product requirements, support the manager in finalising the design specifications and reliability parameters of the product

Description

This NOS is about understanding the product requirements and support the manager in fixing design and reliability parameters of the product

Scope

The product design engineer will be responsible for: Understanding product requirements fixed by the CFT Team Creation of basic product design Support in finalization of design specification Support in ensuring reliability and validity of the product design The role holder will interact with different Centre of Excellence, different CFT's team, Sourcing Team, Prototype department, product conceptualization team and others

Elements and Performance Criteria

Understanding product requirements fixed by the CFT Team

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

PC1.. understand product requirements fixed by the CFT team basis customer preferences, benchmarking data, technology parameters etc.

PC2.. analyse the type of material (including new material) to be used

PC3.. analyse the technology and technique to be used in design of the product

PC4.. brainstorm and create mental picture/ image of the design

PC5.. consider aspects of aesthetic appeal, ergonomics etc. while designing the physical product

PC6.. understand the shape/ size/ environmental impact of the design created

Creation of basic product design

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

PC7.. creation of a freehand sketch/silhouette basis the mental image of the product design

PC8.. selecting the procedure that displays design hierarchy

PC9.. using mechanical CAD (computer aided design) system to generate design geometry

PC10.. on the basis of the initial sketches produce a grid map of the vehicle on a 1:1 scale including all its technical and structural constituents

Support in finalization of design specifications

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

PC11.. support in creation of design input specifications

PC12.. support in creation of requirement specifications for each of the aggregates, body of the vehicle etc.

PC13.. support the manager in achieving the required specification of the product

PC14.. ensure conformance between design output and design input

PC15.. support the manager in deciding the means for providing design input

PC16.. support the manager in deciding the means of demonstration that each requirement has been met

PC17.. support in creating a mechanism for capturing design output

PC18.. develop a quality cost delivery analyses for all decision metrics relating to developing the body of the car and cost involved

PC19.. support the manager in defining elements related to colour design (interior and exterior) through analysis of a range of data including what colours are in vogue in the fields of fashion and interior design around the world

Support in ensuring reliability and validity of the product design

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

PC20.. define reliability requirements on the basis of benchmarks, competitive analysis, cost, safety etc. with the support on the manager

PC21.. prioritize key reliability risk items and the corresponding risk reduction strategy with the help of the product design manager

PC22.. estimate the products design reliability

PC23.. analyse product reliability using simulation models, prior warranty and tests data from similar models

PC24.. analyse failure risks and mechanics

PC25.. use design of experiments methodology to identify factors significant to the life of the vehicle

PC26.. use life data analysis (LDA) techniques to statistically estimate the reliability of the product design and calculate various reliability-related metrics

PC27.. conduct reliability growth (RG) testing and analyse effective methodology to discover defects and improve the design during/ post testing inputs

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant manufacturing standards and procedures followed in the company

KU2. different types of products manufactured by the company

KU3. organization methodology/ procedures used for product design

KU4. management of product design as per the procedures defined by the organization

KU5. quality norms and standards prescribed in the Quality Manual by the organization

KU6. 5S and Safety norms practiced in the organization

KU7. fundamentals of machines and mechanics

KU8. application of relevant principles of functionality, ergonomics, aesthetics etc.

KU9. knowledge of different materials/ chemical process used in product design

KU10. latest technologies in auto industry

KU11. latest regulations in auto industry

KU12. basic Arithmetic and calculation methods for tolerance limits

KU13. metallurgical properties of metals used for different processes

KU14. the methods of using instruments like Vernier callipers, Micrometres, rulers and other inspection tools

KU15. how to read and interpret sketches and engineering drawings

KU16. how to visually represent the final product output and hence decide on the key steps to be followed

Generic Skills (GS)

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

GS1. document information from the manuals, discussion notes, process charts etc.

GS2. create small notes/ work documents/ diagrams for operators and helpers to help them understand the process

GS3. write inter departmental notes/ memos or make suitable entries in the online system

GS4. read equipment manuals and process documents to understand the equipment and processes better

GS5. read internal information memos sent by internal customers (other functions within the organization)

GS6. discuss task lists, schedules, and work-loads with the team members

GS7. answer the queries raised by the team as well as intercompany departments

GS8. attentively listen with full attention the queries and grievances raised by the team and comprehend the information given by the speaker

GS9. break the problem into smaller issues and tasks to arrive at a solution

GS10. understand inter process relationship and establish relationship between various parts of the problem

GS11. leverage experience to find effective solutions to problems

GS12. use organizations analytical tools to arrive at solutions

GS13. plan, organize and prioritize the work with Engineering /R & D, Marketing department

GS14. plan support required from CFT /project teams for benchmarking ,testing, feasibility exercises

GS15. organize information, standards manuals etc. so that sorting becomes easy

GS16. reorganize resources in case of change of plans

GS17. use common sense and make judgments during day to day basis

GS18. use reasoning skills to identify and resolve problems

GS19. use intuition to detect any potential problems which could arise during operations

GS20. accept additional responsibility for self and the team

GS21. encourage self and other to take greater responsibilities

GS22. ensure that the work allocated to the team is completed as per timelines and quality norms

GS23. identify obstacles and bottlenecks in the process and on own find basic level solutions for removing these obstacles

GS24. gather information skilfully from multiple sources

GS25. analyse information in depth and identifies the problem in a timely manner

GS26. develop alternate solutions and resolves problems in early stages

GS27. work tireless in spite of repeat activities in a diligent manner to resolve problems on a day to day basis

GS28. use previous experience in resolving problems and taking decisions

GS29. make timely and independent decisions within the boundaries of the delegation matrix of the organization

GS30. clearly establish a goal for self or others to accomplish

GS31. without instructions from the manager, self-manage the work

GS32. take additional responsibilities to make sure that the work is completed on time

GS33. identify the needs of the customer

GS34. ensure that the product designed meets the expectation of the customer

GS35. understands importance of customer feedback and drives customer focus

GS36. familiarise with leading practices available in the market

GS37. think independently on new approaches to manufacturing process, material management, data management and team management

GS38. represent any new ideas/ approaches on process improvement and productivity improvement to the seniors in the team

GS39. contribute to building a positive team spirit

GS40. identify individual strengths & maximize team performance

GS41. exhibit objectivity & openness to others views

GS42. collaborate with stakeholders to achieve the desired state of final result

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Understanding product requirements fixed by the CFT Team	**10**	**18**	**-**	**-**
PC1.. understand product requirements fixed by the CFT team basis customer preferences, benchmarking data, technology parameters etc.	2	3	-	-
PC2.. analyse the type of material (including new material) to be used	2	3	-	-
PC3.. analyse the technology and technique to be used in design of the product	2	3	-	-
PC4.. brainstorm and create mental picture/ image of the design	1	3	-	-
PC5.. consider aspects of aesthetic appeal, ergonomics etc. while designing the physical product	2	3	-	-
PC6.. understand the shape/ size/ environmental impact of the design created	1	3	-	-
Creation of basic product design	**4**	**12**	**-**	**-**
PC7.. creation of a freehand sketch/silhouette basis the mental image of the product design	1	3	-	-
PC8.. selecting the procedure that displays design hierarchy	1	3	-	-
PC9.. using mechanical CAD (computer aided design) system to generate design geometry	1	3	-	-
PC10.. on the basis of the initial sketches produce a grid map of the vehicle on a 1:1 scale including all its technical and structural constituents	1	3	-	-
Support in finalization of design specifications	**6**	**23**	**-**	**-**
PC11.. support in creation of design input specifications	0.5	3	-	-
PC12.. support in creation of requirement specifications for each of the aggregates, body of the vehicle etc.	0.5	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13.. support the manager in achieving the required specification of the product	0.5	3	-	-
PC14.. ensure conformance between design output and design input	1	3	-	-
PC15.. support the manager in deciding the means for providing design input	0.5	2	-	-
PC16.. support the manager in deciding the means of demonstration that each requirement has been met	0.5	2	-	-
PC17.. support in creating a mechanism for capturing design output	1	2	-	-
PC18.. develop a quality cost delivery analyses for all decision metrics relating to developing the body of the car and cost involved	1	3	-	-
PC19.. support the manager in defining elements related to colour design (interior and exterior) through analysis of a range of data including what colours are in vogue in the fields of fashion and interior design around the world	0.5	2	-	-
Support in ensuring reliability and validity of the product design	**10**	**17**	**-**	**-**
PC20.. define reliability requirements on the basis of benchmarks, competitive analysis, cost, safety etc. with the support on the manager	1	3	-	-
PC21.. prioritize key reliability risk items and the corresponding risk reduction strategy with the help of the product design manager	1	2	-	-
PC22.. estimate the products design reliability	1	2	-	-
PC23.. analyse product reliability using simulation models, prior warranty and tests data from similar models	2	2	-	-
PC24.. analyse failure risks and mechanics	2	2	-	-
PC25.. use design of experiments methodology to identify factors significant to the life of the vehicle	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC26.. use life data analysis (LDA) techniques to statistically estimate the reliability of the product design and calculate various reliability-related metrics	1	2	-	-
PC27.. conduct reliability growth (RG) testing and analyse effective methodology to discover defects and improve the design during/ post testing inputs	1	2	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N8102
NOS Name	Understanding the product requirements, support the manager in finalising the design specifications and reliability parameters of the product
Sector	Automotive
Sub-Sector	Manufacturing and R&D
Occupation	Product Design
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	20/01/2013
Next Review Date	20/01/2016
NSQC Clearance Date	

ASC/N8103: Designing of vehicles using computer aided technology

Description

This NOS is about designing vehicles using computer aided technology along with ensuing design FMEA, telematics, human machine interface aspects are also taken into consideration

Scope

The product design engineer will be responsible for: Designing the vehicle using CAD/ CAE Conducting design FMEA Performing simulations on the product design Complete process pertaining to telematics and human machine interface for product design The role holder will interact with different Centre of Excellence, different CFT's team, Sourcing Team, Prototype department, product conceptualization team and others

Elements and Performance Criteria

Designing the vehicle/ components using CAD/ CAE

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

PC1.. understand the application of CAD (computer aided design) and CAE (computer aided engineering)

PC2.. support the manager in transforming the functional architecture to physical architecture

PC3.. create product designs as per the defined geometrical parameters which can be readily altered by changing relevant parameters

PC4.. creation of 2D/ 3D model using CAD/ CAE along engineering inputs, customer requirements and product necessities using the modelling section of the software

PC5.. analyse the model using loads to check and validate the design

PC6.. digitizing and translating the clay model into a CAD design into 3D real time view

PC7.. designing of the smaller parts to check if they all fit and add to structural viability

PC8.. incorporate engineering parameters related to speed, cutting pattern, coolant information etc. to the CAD/ CAE

Conduct design FMEA (Failure Mode Effect Analysis)

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

PC9.. identify the purpose of the design

PC10.. identify all the ways the failure could happen (creation of failure modes)

PC11.. identify the consequence of each failure mode

PC12.. determine the seriousness of each effect

PC13.. creation of a rating system (0 to 10) to identify how serious each effect is

PC14.. for each failure mode determine the potential root causes

PC15.. for each cause determine the occurrence rating o (between 0 and 10)

PC16.. for each cause, identify current process controls that are applicable

PC17.. for each cause, identify controls that can be established

PC18.. for each control, determine the detection rating, or d

PC19.. identify recommended actions (design changes) to lower severity or occurrence

Perform simulations on the product design

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

PC20.. check for architectural design verification

PC21.. formulate simulation model to be used with the support of the manager

PC22.. test the model and compare behaviour with that of the actual problem environment

PC23.. run the simulation, analyse results and make changes accordingly

PC24.. rerun simulation to test the new solution

PC25.. validate simulation to increase the chances that the simulation will be valid in the real world

Complete process pertaining to telematics and human machine interface for product design

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

PC26.. validate that telematics follows requirements

PC27.. ensure its functionality of telematics

PC28.. ensure telematics system can analyse drivers sense of driving

PC29.. adopt a high performance HMI (human machine interface) philosophy and style guide with proper principles

PC30.. determine specific performance and goal objectives/targets for process control, such as safety parameters, production rate, efficiency, cost, and quality

PC31.. analyse controls that must be monitored and manipulated to achieve the performance and goal objectives, determining the content of each level 2 and 3 graphic

PC32.. design high performance graphics, following the hmi philosophy, addressing the identified tasks

PC33.. install, commission, and provide training on the new hmi

PC34.. control, maintain, and periodically reassess the hmi performance

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. relevant manufacturing standards and procedures followed in the company

KU2. different types of products manufactured by the company

KU3. organization methodology/ procedures used for product design

KU4. management of product design as per the procedures defined by the organization

KU5. quality norms and standards prescribed in the Quality Manual by the organization

KU6. 5S and Safety norms practiced in the organization

KU7. fundamentals of machines and mechanics

KU8. application of relevant principles of functionality, ergonomics, aesthetics etc.

KU9. telematics, human machine interface functionality

KU10. knowledge of different materials/ chemical process used in product design

KU11. atest technologies in auto industry

KU12. latest regulations in auto industry

KU13. basic Arithmetic and calculation methods for tolerance limits

KU14. metallurgical properties of metals used for different processes
KU15. the methods of using instruments like Vernier callipers, Micrometres, rulers and other inspection tools
KU16. how to read and interpret sketches and engineering drawings
KU17. how to visually represent the final product output and hence decide on the key steps to be followed
KU18. eye for detail towards completing the assigned design task
KU19. Patience in doing repeated work

Generic Skills (GS)

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

GS1. document information from the manuals, discussion notes, process charts etc
GS2. create small notes/ work documents/ diagrams for operators and helpers to help them understand the process
GS3. write inter departmental notes/ memos or make suitable entries in the online system
GS4. read equipment manuals and process documents to understand the equipment and processes better
GS5. read internal information memos send by internal customers (other functions within the organization)
GS6. discuss task lists, schedules, and work-loads with the team members
GS7. answer the queries raised by the team as well as intercompany departments
GS8. attentively listen with full attention the queries and grievances raised by the team and comprehend the information given by the speaker
GS9. break the problem into smaller issues and tasks to arrive at a solution
GS10. understand inter process relationship and establish relationship between various parts of the problem
GS11. everage experience to find effective solutions to problems
GS12. use organizations analytical tools to arrive at solutions
GS13. plan, organize and prioritize the work with Engineering /R & D, Marketing department
GS14. plan support required from CFT /project teams for benchmarking ,testing, feasibility exercises
GS15. organize information, standards manuals etc. so that sorting becomes easy
GS16. reorganize resources in case of change of plans
GS17. use common sense and make judgments during day to day basis
GS18. use reasoning skills to identify and resolve problems
GS19. use intuition to detect any potential problems which could arise during operations
GS20. accept additional responsibility for self and the team
GS21. encourage self and other to take greater responsibilities
GS22. ensure that the work allocated to the team is completed as per timelines and quality norms
GS23. identify obstacles and bottlenecks in the process and on own find basic level solutions for removing these obstacles

GS24. gather information skilfully from multiple sources
GS25. analyse information in depth and identifies the problem in a timely manner
GS26. develop alternate solutions and resolves problems in early stages
GS27. work tireless in spite of repeat activities in a diligent manner to resolve problems on a day to day basis
GS28. use previous experience in resolving problems and taking decisions
GS29. make timely and independent decisions within the boundaries of the delegation matrix of the organization
GS30. clearly establish a goal for self or others to accomplish
GS31. without instructions from the manager, self-manage the work
GS32. take additional responsibilities to make sure that the work is completed on time
GS33. identify the needs of the customer
GS34. ensure that the product designed meets the expectation of the customer
GS35. understands importance of customer feedback and drives customer focus
GS36. familiarise with leading practices available in the market
GS37. think independently on new approaches to manufacturing process, material management, data management and team management
GS38. represent any new ideas/ approaches on process improvement and productivity improvement to the seniors in the team
GS39. contribute to building a positive team spirit
GS40. identify individual strengths & maximize team performance
GS41. exhibit objectivity & openness to others views
GS42. collaborate with stakeholders to achieve the desired state of final result

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Designing the vehicle/ components using CAD/ CAE	**11**	**19**	**-**	**-**
PC1.. understand the application of CAD (computer aided design) and CAE (computer aided engineering)	1	2	-	-
PC2.. support the manager in transforming the functional architecture to physical architecture	1	2	-	-
PC3.. create product designs as per the defined geometrical parameters which can be readily altered by changing relevant parameters	2	3	-	-
PC4.. creation of 2D/ 3D model using CAD/ CAE along engineering inputs, customer requirements and product necessities using the modelling section of the software	2	3	-	-
PC5.. analyse the model using loads to check and validate the design	2	3	-	-
PC6.. digitizing and translating the clay model into a CAD design into 3D real time view	1	2	-	-
PC7.. designing of the smaller parts to check if they all fit and add to structural viability	1	2	-	-
PC8.. incorporate engineering parameters related to speed, cutting pattern, coolant information etc. to the CAD/ CAE	1	2	-	-
Conduct design FMEA (Failure Mode Effect Analysis)	**9**	**22**	**-**	**-**
PC9.. identify the purpose of the design	1	2	-	-
PC10.. identify all the ways the failure could happen (creation of failure modes)	1	2	-	-
PC11.. identify the consequence of each failure mode	1	2	-	-
PC12.. determine the seriousness of each effect	0.5	2	-	-
PC13.. creation of a rating system (0 to 10) to identify how serious each effect is	0.5	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14.. for each failure mode determine the potential root causes	1	2	-	-
PC15.. for each cause determine the occurrence rating o (between 0 and 10)	1	2	-	-
PC16.. for each cause, identify current process controls that are applicable	0.5	2	-	-
PC17.. for each cause, identify controls that can be established	0.5	2	-	-
PC18.. for each control, determine the detection rating, or d	1	2	-	-
PC19.. identify recommended actions (design changes) to lower severity or occurrence	1	2	-	-
Perform simulations on the product design	**4**	**11**	**-**	**-**
PC20.. check for architectural design verification	1	2	-	-
PC21.. formulate simulation model to be used with the support of the manager	0.5	1	-	-
PC22.. test the model and compare behaviour with that of the actual problem environment	1	2	-	-
PC23.. run the simulation, analyse results and make changes accordingly	0.5	2	-	-
PC24.. rerun simulation to test the new solution	0.5	2	-	-
PC25.. validate simulation to increase the chances that the simulation will be valid in the real world	0.5	2	-	-
Complete process pertaining to telematics and human machine interface for product design	**6**	**18**	**-**	**-**
PC26.. validate that telematics follows requirements	0.5	2	-	-
PC27.. ensure its functionality of telematics	0.5	2	-	-
PC28.. ensure telematics system can analyse drivers sense of driving	0.5	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC29.. adopt a high performance HMI (human machine interface) philosophy and style guide with proper principles	0.5	2	-	-
PC30.. determine specific performance and goal objectives/targets for process control, such as safety parameters, production rate, efficiency, cost, and quality	0.5	2	-	-
PC31.. analyse controls that must be monitored and manipulated to achieve the performance and goal objectives, determining the content of each level 2 and 3 graphic	1	2	-	-
PC32.. design high performance graphics, following the hmi philosophy, addressing the identified tasks	1	2	-	-
PC33.. install, commission, and provide training on the new hmi	1	2	-	-
PC34.. control, maintain, and periodically reassess the hmi performance	0.5	2	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N8103
NOS Name	Designing of vehicles using computer aided technology
Sector	Automotive
Sub-Sector	Manufacturing and R&D
Occupation	Product Design
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	20/01/2013
Next Review Date	20/01/2016
NSQC Clearance Date	

ASC/N8104: Managing the product data and system integration mechanism

Description

This NOS is about managing the product data and system integration mechanism

Scope

The product design engineer will be responsible for: Supporting in creating standardization for capturing work analysis Ensure management of product design data Ensure system integration mechanism are in place The role holder will interact with different Centre of Excellence, different CFT's team, Sourcing Team, Prototype department, product conceptualization team and others

Elements and Performance Criteria

Support in creating standardization for capturing work analysis

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

PC1.. support in creation of a standardized work analysis sheet to see the same basic processes are used

PC2.. ensure validation of the work analysis sheet

PC3.. standardize the time to check that the processes are being conducted within the specified amount of time

PC4.. creation of a standardized work combination sheet

PC5.. identifying the work sequence order

PC6.. standardize the applicability of different processes to be used

Ensure management of product design data

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

PC7.. identify the product and information regarding the product design

PC8.. identify product structure management- product material, process management of the product

PC9.. identify and store information regarding product development and tools to be used

PC10.. change control and change assessment management in case of any changes to the product design data

PC11.. generating on status accounting the product: its history, present use, serialization, part status, customer data

Ensure system integration mechanism are in place

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

PC12.. support in creation of a system integration team who help integrate all the parts of the product design data

PC13.. ensure planning and control of the entire system though status control reports, meetings reviews etc.

PC14.. ensure continued system integration and validating of the data captured

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. different types of products manufactured by the company
KU2. organization methodology/ procedures used for product design
KU3. management of product design as per the procedures defined by the organization
KU4. quality norms and standards prescribed in the Quality Manual by the organization
KU5. 5S and Safety norms practiced in the organization
KU6. fundamentals of machines and mechanics
KU7. application of relevant principles of functionality, ergonomics, aesthetics etc.
KU8. knowledge of different materials/ chemical process used in product design
KU9. latest technologies in auto industry
KU10. latest regulations in auto industry
KU11. how to read and interpret sketches and engineering drawings
KU12. how to visually represent the final product output and hence decide on the key steps to be followed

Generic Skills (GS)

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

GS1. document information from the manuals, discussion notes, process charts etc
GS2. create small notes/ work documents/ diagrams for operators and helpers to help them understand the process
GS3. write inter departmental notes/ memos or make suitable entries in the online system
GS4. read equipment manuals and process documents to understand the equipment and processes better
GS5. read internal information memos send by internal customers (other functions within the organization)
GS6. discuss task lists, schedules, and work-loads with the team members
GS7. answer the queries raised by the team as well as intercompany departments
GS8. attentively listen with full attention the queries and grievances raised by the team and comprehend the information given by the speaker
GS9. break the problem into smaller issues and tasks to arrive at a solution
GS10. understand inter process relationship and establish relationship between various parts of the problem
GS11. leverage experience to find effective solutions to problems
GS12. use organizations analytical tools to arrive at solutions
GS13. plan, organize and prioritize the work with Engineering /R & D, Marketing department managers / CFT leaders
GS14. plan support required from CFT /project teams for benchmarking ,testing, feasibility exercises

GS15. organize information, standards manuals etc. so that sorting becomes easy
GS16. reorganize resources in case of change of plans
GS17. use common sense and make judgments during day to day basis
GS18. use reasoning skills to identify and resolve problems
GS19. use intuition to detect any potential problems which could arise during operations
GS20. accept additional responsibility for self and the team
GS21. encourage self and other to take greater responsibilities
GS22. ensure that the work allocated to the team is completed as per timelines and quality norms
GS23. identify obstacles and bottlenecks in the process and on own find basic level solutions for removing these obstacles
GS24. gather information skilfully from multiple sources
GS25. analyse information in depth and identifies the problem in a timely manner
GS26. develop alternate solutions and resolves problems in early stages
GS27. work tireless in spite of repeat activities in a diligent manner to resolve problems on a day to day basis
GS28. use previous experience in resolving problems and taking decisions
GS29. make timely and independent decisions within the boundaries of the delegation matrix of the organization
GS30. clearly establish a goal for self or others to accomplish
GS31. without instructions from the manager, self-manage the work
GS32. take additional responsibilities to make sure that the work is completed on time
GS33. familiarise with leading practices available in the market
GS34. think independently on new approaches to manufacturing process, material management, data management and team management
GS35. represent any new ideas/ approaches on process improvement and productivity improvement to the seniors in the team
GS36. contribute to building a positive team spirit
GS37. identify individual strengths & maximize team performance
GS38. exhibit objectivity & openness to others views
GS39. collaborate with stakeholders to achieve the desired state of final result

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Support in creating standardization for capturing work analysis	**12**	**33**	**-**	**-**
PC1.. support in creation of a standardized work analysis sheet to see the same basic processes are used	1	5	-	-
PC2.. ensure validation of the work analysis sheet	1	5	-	-
PC3.. standardize the time to check that the processes are being conducted within the specified amount of time	1	5	-	-
PC4.. creation of a standardized work combination sheet	3	6	-	-
PC5.. identifying the work sequence order	3	6	-	-
PC6.. standardize the applicability of different processes to be used	3	6	-	-
Ensure management of product design data	**12**	**22**	**-**	**-**
PC7.. identify the product and information regarding the product design	2	4	-	-
PC8.. identify product structure management-product material, process management of the product	2	4	-	-
PC9.. identify and store information regarding product development and tools to be used	2	4	-	-
PC10.. change control and change assessment management in case of any changes to the product design data	3	5	-	-
PC11.. generating on status accounting the product: its history, present use, serialization, part status, customer data	3	5	-	-
Ensure system integration mechanism are in place	**6**	**15**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12.. support in creation of a system integration team who help integrate all the parts of the product design data	2	5	-	-
PC13.. ensure planning and control of the entire system though status control reports, meetings reviews etc.	2	5	-	-
PC14.. ensure continued system integration and validating of the data captured	2	5	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N8104
NOS Name	Managing the product data and system integration mechanism
Sector	Automotive
Sub-Sector	Manufacturing and R&D
Occupation	Product Design
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	09/01/2014
Next Review Date	09/01/2016
NSQC Clearance Date	

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ 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 Element/ PC.

2. The assessment for the theory part will be based on 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 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. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass % aggregate for the QP.

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

Recommended Pass % : 75

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N0006.Maintain a safe and healthy working environment	25	75	-	-	100	15
ASC/N0022.Ensure implementation of 5S activities at the shop floor & the office area	29	71	-	-	100	15

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N8102.Understanding the product requirements, support the manager in finalising the design specifications and reliability parameters of the product	30	70	-	-	100	25
ASC/N8103.Designing of vehicles using computer aided technology	30	70	-	-	100	25
ASC/N8104.Managing the product data and system integration mechanism	30	70	-	-	100	20
Total	**144**	**356**	**-**	**-**	**500**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

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.