



Automotive Conventional Machining Technician

QP Code: ASC/Q3510

Version: 1.0

NSQF Level: 4

Automotive Skills Development Council || 153, Gr Floor, Okhla Industrial Area, Phase - III, Leela Building
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ASC/Q3510: Automotive Conventional Machining Technician

Brief Job Description

The individual is primarily involved in various machining and inspection work on conventional/manual machines such as quality verification, minor repair work, change of worn out tools, re-setting of the tools, etc.

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/N9805: Interpret engineering drawing](#)
4. [ASC/N3536: Perform turning operations on conventional lathe](#)
5. [ASC/N3537: Perform drilling, reaming, tapping and boring operations on conventional lathe](#)
6. [ASC/N3539: Perform grinding operations on conventional lathe](#)
7. [ASC/N3538: Perform milling operations on conventional lathe](#)

Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Machining Operation
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO- 2015/7223.0601, 7223.1701, 7224.0402, 7223.1201

Minimum Educational Qualification & Experience	12th Class with minimum 1 Year of experience in Machining OR I.T.I (Machinist/Turner) OR Certificate-NSQF (Automotive Machining Operator Level 3) with minimum 2 Years of experience
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	18/11/2020
Next Review Date	18/11/2025
NSQC Approval Date	29/01/2021
Version	1.0

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	3
Credits	TBD
Version	1.0
Last Reviewed Date	18/11/2020
Next Review Date	18/11/2025
NSQC Clearance Date	29/01/2021

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	3
Credits	TBD
Version	1.0
Last Reviewed Date	18/11/2020
Next Review Date	18/11/2025
NSQC Clearance Date	29/01/2021

ASC/N9805: Interpret engineering drawing

Description

This NOS unit is about reading and interpreting all concepts, symbols, methods, views, etc. of engineering drawing.

Scope

The scope covers the following :

- Interpret information from various views, projection, 2D and 3D shapes
- Identify drawing standards and symbols
- Modification and storage of drawing

Elements and Performance Criteria

Interpret information from various views, projection, 2D and 3D shapes

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

- PC1.** interpret engineering drawing's uniqueness, dimensions and important features in 2D and 3D shapes
- PC2.** identify the difference between 2D and 3D shapes
- PC3.** explain difference between first angle projection and third angle projection in mechanical engineering drawing
- PC4.** interpret all the 3 axes (x, y and z axis) and geometrical shapes (cones, cylinder, sphere, cuboid, etc) on to a 2D and 3D projection
- PC5.** identify details of the machine component which are not clearly visible by interpreting section views

Identify drawing standards and symbols

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

- PC6.** interpret Geometric Dimensioning and Tolerancing (GD&T) symbols in the drawings
- PC7.** interpret symbols of Radius, controlled radius, spherical radius, diameter, spherical diameter, square, counterbore, spotface, depth, countersink, "by", maximum dimension, minimum dimension, reference, dimension origin etc
- PC8.** identify the sequence of operations which enables the selection and prioritization of the datums
- PC9.** read and interpret information from Tolerance Zone boundaries for part features in terms of shape and size

Modification and storage of drawing

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

- PC10.** observe any modification, changes required in the drawing and communicate the same to the concerned team in the organization
- PC11.** store the drawings in an easily accessible place, avoiding damage from moisture, chemicals and fire

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant organisational standards such as work standard, Standard Operating Procedure, quality process, maintenance standards etc. followed in the company
- KU2.** importance of cycle-time and required output as per work order and work instructions
- KU3.** drawing standards used by the company
- KU4.** use of drawing tools such as scales, compass, types of pencils, CAD and CAM software etc.
- KU5.** the basics of engineering drawing, orthographic projection, isometric projection, GD&T etc.
- KU6.** importance of various projections, views, symbols and dimensions of drawing
- KU7.** use of geometric shapes like lines, angles, circles, etc for interpreting the drawing

Generic Skills (GS)

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

- GS1.** read and interpret workplace related drawing
- GS2.** communicate the changes and requirements to supervisor by using relevant drawing terms and nomenclature
- GS3.** attentively listen and comprehend the information given by the supervisor/team members
- GS4.** write in English/regional language
- GS5.** recognise problem in drawing and take suitable action
- GS6.** analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Interpret information from various views, projection, 2D and 3D shapes</i>	21	11	-	10
PC1. interpret engineering drawing's uniqueness, dimensions and important features in 2D and 3D shapes	5	3	-	2
PC2. identify the difference between 2D and 3D shapes	4	2	-	2
PC3. explain difference between first angle projection and third angle projection in mechanical engineering drawing	4	-	-	2
PC4. interpret all the 3 axes (x, y and z axis) and geometrical shapes (cones, cylinder, sphere, cuboid, etc) on to a 2D and 3D projection	5	3	-	2
PC5. identify details of the machine component which are not clearly visible by interpreting section views	3	3	-	2
<i>Identify drawing standards and symbols</i>	23	15	-	8
PC6. interpret Geometric Dimensioning and Tolerancing (GD&T) symbols in the drawings	6	4	-	2
PC7. interpret symbols of Radius, controlled radius, spherical radius, diameter, spherical diameter, square, counterbore, spotface, depth, countersink, "by", maximum dimension, minimum dimension, reference, dimension origin etc	6	4	-	2
PC8. identify the sequence of operations which enables the selection and prioritization of the datums	5	3	-	2
PC9. read and interpret information from Tolerance Zone boundaries for part features in terms of shape and size	6	4	-	2
<i>Modification and storage of drawing</i>	6	4	-	2
PC10. observe any modification, changes required in the drawing and communicate the same to the concerned team in the organization	3	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. store the drawings in an easily accessible place, avoiding damage from moisture, chemicals and fire	3	2	-	1
NOS Total	50	30	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9805
NOS Name	Interpret engineering drawing
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	18/11/2020
Next Review Date	18/11/2025
NSQC Clearance Date	29/01/2021

ASC/N3536: Perform turning operations on conventional lathe

Description

This NOS unit is about performing and finishing turning operations on the Conventional/Manual lathe machine as per the given work order and the standards specified by the organization.

Scope

The scope covers the following :

- Prepare for turning operations
- Perform turning operations
- Perform post-machining operations

Elements and Performance Criteria

Prepare for turning operations

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

- PC1.** identify the final output product based on engineering drawing
- PC2.** identify the tools, measuring instruments and input materials required for the job
- PC3.** check the raw material, tools and equipment for any defects and that they are as per the required quality standards
- PC4.** follow the tooling instructions for fixtures, cutting tools, jigs, gauges etc., as specified in the Operating Manual/Work Instructions and collect all the required items from the store
- PC5.** set-up the conventional lathe machine to perform turning operations
- PC6.** adjust the machine controls to ensure conformance with the specified tolerances
- PC7.** mount, install and align tools, attachments and fixtures on machine by using hand tools and precision measuring instruments
- PC8.** lift the work piece/metal stock manually or by hoist, position the same securely on the machine bed by using workholding devices and verify their positions with measuring instruments if required
- PC9.** select and install pre-set toolings in tool posts

Perform turning operations

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

- PC10.** set the machine parameters like cutting speed, depth of cut and feed rate and position cutting tool and work piece as per work instructions
- PC11.** move cutter or turning hand wheel manually for machining the work piece as per the required specifications
- PC12.** start the turning machine, produce the component and inspect the first-run piece for conformance to specifications by using precision gauges
- PC13.** run the machine for mass production of components, if the first run-piece meets the specified requirements

Perform post-machining operations

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

- PC14.** check the component as per the control plan, work instructions for product quality

- PCI5.** note down the observations of the basic inspection process and identify pieces which are as per the specified standards
- PCI6.** separate the completed pieces into Ok pieces and defective pieces which can be repaired/reworked and pieces which are beyond repair and maintain records of each category
- PCI7.** observe the machine operations for any malfunctions/defects in the component and immediately inform the supervisor/maintenance team for correction
- PCI8.** replace worn out tools timely and safely with new tools and perform minor maintenance activities

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** Standard Operating Procedures (SOP) for operating the lathe machine
- KU2.** fundamentals of the turning machines
- KU3.** the process flow of the turning operations
- KU4.** SOP recommended by the manufacturer for using tools, jigs, fixtures, measuring instruments etc. used during the machining processes
- KU5.** the impact of various machining parameters on the final product
- KU6.** the use of various cutting tools for different machining operations
- KU7.** how to load and unload lathe machine parts safely
- KU8.** SOP recommended by the organisation for checking irregularities in the product/work piece
- KU9.** how to compute unspecified dimensions and machine settings
- KU10.** safety requirements for lathe machine and tools during the machining work
- KU11.** the post machining processes like inspection, cleaning, maintenance etc.
- KU12.** the organisational standard practices for performing maintenance activities
- KU13.** the various inspection methods for inspecting the quality of machined product

Generic Skills (GS)

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

- GS1.** read and interpret drawings, charts and machine readings
- GS2.** communicate using terms, names, grades and other nomenclature pertaining to the automotive trade
- GS3.** communicate effectively at the workplace
- GS4.** attentively listen and comprehend the information given by the lead technician/team members
- GS5.** write observations and any work related information in English/regional language
- GS6.** recognise a workplace problem and take suitable action
- GS7.** analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
- GS8.** plan and organize tools, machines and consumables for carrying out machining job

GS9. complete the assigned tasks with minimum supervision

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare for turning operations</i>	16	22	-	11
PC1. identify the final output product based on engineering drawing	2	1	-	1
PC2. identify the tools, measuring instruments and input materials required for the job	2	3	-	2
PC3. check the raw material, tools and equipment for any defects and that they are as per the required quality standards	2	2	-	1
PC4. follow the tooling instructions for fixtures, cutting tools, jigs, gauges etc., as specified in the Operating Manual/Work Instructions and collect all the required items from the store	2	2	-	1
PC5. set-up the conventional lathe machine to perform turning operations	2	3	-	2
PC6. adjust the machine controls to ensure conformance with the specified tolerances	1	3	-	1
PC7. mount, install and align tools, attachments and fixtures on machine by using hand tools and precision measuring instruments	2	3	-	1
PC8. lift the work piece/metal stock manually or by hoist, position the same securely on the machine bed by using workholding devices and verify their positions with measuring instruments if required	2	3	-	2
PC9. select and install pre-set toolings in tool posts	1	2	-	-
<i>Perform turning operations</i>	6	15	-	3
PC10. set the machine parameters like cutting speed, depth of cut and feed rate and position cutting tool and work piece as per work instructions	1	3	-	1
PC11. move cutter or turning hand wheel manually for machining the work piece as per the required specifications	1	3	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. start the turning machine, produce the component and inspect the first-run piece for conformance to specifications by using precision gauges	3	5	-	-
PC13. run the machine for mass production of components, if the first run-piece meets the specified requirements	1	4	-	1
<i>Perform post-machining operations</i>	8	13	-	6
PC14. check the component as per the control plan, work instructions for product quality	2	3	-	-
PC15. note down the observations of the basic inspection process and identify pieces which are as per the specified standards	1	2	-	2
PC16. separate the completed pieces into Ok pieces and defective pieces which can be repaired/reworked and pieces which are beyond repair and maintain records of each category	2	3	-	-
PC17. observe the machine operations for any malfunctions/defects in the component and immediately inform the supervisor/maintenance team for correction	1	2	-	2
PC18. replace worn out tools timely and safely with new tools and perform minor maintenance activities	2	3	-	2
NOS Total	30	50	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N3536
NOS Name	Perform turning operations on conventional lathe
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Machining Operation
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	18/11/2020
Next Review Date	18/11/2025
NSQC Clearance Date	29/01/2021

ASC/N3537: Perform drilling, reaming, tapping and boring operations on conventional lathe

Description

This NOS unit is about carrying out various operations such as drilling, reaming, tapping and boring on the Conventional/Manual lathe machine as per the given work order and the standards specified by the organization.

Scope

The scope covers the following :

- Prepare for drilling, reaming, tapping and boring operations
- Perform drilling, reaming and tapping operations
- Perform boring operations
- Perform post-machining operations

Elements and Performance Criteria

Prepare for drilling, reaming, tapping and boring operations

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

- PC1.** identify the final output product based on engineering drawing
- PC2.** identify the tools, measuring instruments and input materials required for the job
- PC3.** check the raw material, tools and equipment for any defects and that they are as per the required quality standards
- PC4.** follow the tooling instructions for fixtures, cutting tools, jigs, gauges etc., as specified in the Operating Manual/Work Instructions and collect all the required items from the store
- PC5.** set-up the conventional machine to perform drilling, reaming and tapping activities
- PC6.** adjust the machine controls to ensure conformance with the specified tolerances
- PC7.** mount, install and align tools, attachments and fixtures on machine by using hand tools and precision measuring instruments
- PC8.** lift the work piece/metal stock manually or by hoist, position the same securely on the machine bed by using workholding devices and verify their positions with measuring instruments if required

Perform drilling, reaming and tapping operations

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

- PC9.** set the machine parameters like cutting speed, depth of cut and feed rate and position cutting tool and work piece as per work instructions
- PC10.** move drilling, reaming and tapping tool or material or turning hand wheel manually to complete the operation as per specifications
- PC11.** start the drilling, reaming and tapping machine, produce the WIP component and inspect the first-run piece for conformance to specifications by using precision gauges
- PC12.** run the machine for mass production of WIP components, if the first run-piece meets the specified requirements

Perform boring operations

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

- PCI3.** set-up the conventional boring machine to perform boring operations
- PCI4.** set the boring tool into boring bar before positioning them for boring operations by using precision gauges and instrument
- PCI5.** set the machine parameters like cutting speed, depth of cut and feed rate and position cutting tool and work piece as per work instructions
- PCI6.** move tool or material manually or by turning hand wheel to complete the operation as per specifications
- PCI7.** start the boring operation, produce the final component and inspect the first-run piece for conformance to specifications by using precision gauges
- PCI8.** run the machine for mass production of final components, if first run-piece meets the specified requirements

Perform post-machining operations

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

- PCI9.** check the component as per the control plan, work instructions for product quality
- PC20.** note down the observations of the basic inspection process and identify pieces which are as per the specified standards
- PC21.** separate the completed pieces into Ok pieces and defective pieces which can be repaired/reworked and pieces which are beyond repair and maintain records of each category
- PC22.** observe the machine operations for any malfunctions/defects in the component and immediately inform the supervisor/maintenance team for correction
- PC23.** replace worn out tools timely and safely with new tools and perform minor maintenance activities

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** Standard Operating Procedures (SOP) for operating the drilling reaming, tapping and boring machines
- KU2.** the process flow of the drilling, tapping, reaming and boring operations
- KU3.** SOP recommended by the manufacturer for using tools, jigs, fixtures, measuring instruments etc. used during the machining processes
- KU4.** the impact of various machining parameters on the final product
- KU5.** the use of various cutting tools for different machining operations
- KU6.** how to load, unload, fix and set the machine parts, tools and grinding wheels safely
- KU7.** SOP recommended by the organisation for checking irregularities in the product/work piece
- KU8.** how to compute unspecified dimensions and machine settings
- KU9.** safety requirements for machine and tools during the machining work
- KU10.** the post machining processes like inspection, cleaning, maintenance etc.
- KU11.** the organisational standard practices for performing maintenance activities
- KU12.** the various inspection methods for inspecting the quality of machined product

Generic Skills (GS)

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

- GS1.** read and interpret drawings, charts and machine readings
- GS2.** communicate using terms, names, grades and other nomenclature pertaining to the automotive trade
- GS3.** communicate effectively at the workplace
- GS4.** attentively listen and comprehend the information given by the lead technician/team members
- GS5.** write observations and any work related information in English/regional language
- GS6.** recognise a workplace problem and take suitable action
- GS7.** analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
- GS8.** plan and organize tools, machines and consumables for carrying out machining job
- GS9.** complete the assigned tasks with minimum supervision

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare for drilling, reaming, tapping and boring operations</i>	11	16	-	9
PC1. identify the final output product based on engineering drawing	1	1	-	1
PC2. identify the tools, measuring instruments and input materials required for the job	2	2	-	2
PC3. check the raw material, tools and equipment for any defects and that they are as per the required quality standards	1	2	-	1
PC4. follow the tooling instructions for fixtures, cutting tools, jigs, gauges etc., as specified in the Operating Manual/Work Instructions and collect all the required items from the store	1	2	-	1
PC5. set-up the conventional machine to perform drilling, reaming and tapping activities	1	2	-	1
PC6. adjust the machine controls to ensure conformance with the specified tolerances	1	2	-	1
PC7. mount, install and align tools, attachments and fixtures on machine by using hand tools and precision measuring instruments	2	2	-	1
PC8. lift the work piece/metal stock manually or by hoist, position the same securely on the machine bed by using workholding devices and verify their positions with measuring instruments if required	2	3	-	1
<i>Perform drilling, reaming and tapping operations</i>	6	10	-	2
PC9. set the machine parameters like cutting speed, depth of cut and feed rate and position cutting tool and work piece as per work instructions	2	2	-	-
PC10. move drilling, reaming and tapping tool or material or turning hand wheel manually to complete the operation as per specifications	1	1	-	1
PC11. start the drilling, reaming and tapping machine, produce the WIP component and inspect the first-run piece for conformance to specifications by using precision gauges	2	4	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. run the machine for mass production of WIP components, if the first run-piece meets the specified requirements	1	3	-	-
<i>Perform boring operations</i>	8	16	-	6
PC13. set-up the conventional boring machine to perform boring operations	1	2	-	1
PC14. set the boring tool into boring bar before positioning them for boring operations by using precision gauges and instrument	1	2	-	1
PC15. set the machine parameters like cutting speed, depth of cut and feed rate and position cutting tool and work piece as per work instructions	2	2	-	1
PC16. move tool or material manually or by turning hand wheel to complete the operation as per specifications	1	2	-	1
PC17. start the boring operation, produce the final component and inspect the first-run piece for conformance to specifications by using precision gauges	2	5	-	1
PC18. run the machine for mass production of final components, if first run-piece meets the specified requirements	1	3	-	1
<i>Perform post-machining operations</i>	5	8	-	3
PC19. check the component as per the control plan, work instructions for product quality	1	-	-	1
PC20. note down the observations of the basic inspection process and identify pieces which are as per the specified standards	1	2	-	-
PC21. separate the completed pieces into Ok pieces and defective pieces which can be repaired/reworked and pieces which are beyond repair and maintain records of each category	1	2	-	1
PC22. observe the machine operations for any malfunctions/defects in the component and immediately inform the supervisor/maintenance team for correction	1	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC23. replace worn out tools timely and safely with new tools and perform minor maintenance activities	1	2	-	-
NOS Total	30	50	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N3537
NOS Name	Perform drilling, reaming, tapping and boring operations on conventional lathe
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Machining Operation
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	18/11/2020
Next Review Date	18/11/2025
NSQC Clearance Date	29/01/2021

ASC/N3539: Perform grinding operations on conventional lathe

Description

This NOS unit is about performing and finishing grinding on the Conventional/Manual lathe machine as per the given work order and the standards specified by the organization.

Scope

The scope covers the following :

- Prepare for grinding operations
- Perform grinding operations
- Perform post-machining operations

Elements and Performance Criteria

Prepare for grinding operations

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

- PC1.** identify the final output product based on engineering drawing
- PC2.** identify the tools, measuring instruments and input materials required for the job
- PC3.** check the raw material, tools and equipment for any defects and that they are as per the required quality standards
- PC4.** follow the tooling instructions for fixtures, cutting tools, jigs, gauges etc., as specified in the Operating Manual/Work Instructions and collect all the required items from the store
- PC5.** set-up the conventional grinding machine to perform grinding activities
- PC6.** mount, install and align tools, attachments and fixtures on machine by using hand tools and precision measuring instruments
- PC7.** lift the work piece/metal stock manually or by hoist, position the same securely on the machine with grinding wheels by using workholding devices and verify their positions with measuring instruments if required

Perform grinding operations

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

- PC8.** set the grinding parameters such as wheel revolutions, wheel approach speed, feed rate, etc. and position cutting tool and work piece as per work instructions
- PC9.** start the grinding machine, produce the component and inspect the first-run piece for conformance to specifications by using precision gauges
- PC10.** run the machine for mass production of components, if the first run-piece meets the specified requirements

Perform post-machining operations

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

- PC11.** check the component as per the control plan, work instructions for product quality
- PC12.** note down the observations of the basic inspection process and identify pieces which are as per the specified standards

- PCI3.** separate the completed pieces into Ok pieces and defective pieces which can be repaired/reworked and pieces which are beyond repair and maintain records of each category
- PCI4.** observe the machine operations for any malfunctions/defects in the component and immediately inform the supervisor/maintenance team for correction
- PCI5.** replace worn out grinding wheels timely and safely with new wheels and perform minor maintenance activities

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** Standard Operating Procedures (SOP) for operating the grinding machine
- KU2.** the process flow of the grinding operations
- KU3.** SOP recommended by the manufacturer for using tools, jigs, fixtures, measuring instruments etc. used during the machining processes
- KU4.** the impact of various machining parameters on the final product
- KU5.** the use of various cutting tools for different machining operations
- KU6.** how to load, unload, fix and set the machine parts, tools and grinding wheels safely
- KU7.** SOP recommended by the organisation for checking irregularities in the product/work piece
- KU8.** how to compute unspecified dimensions and machine settings
- KU9.** safety requirements for machine and tools during the machining work
- KU10.** the post machining processes like inspection, cleaning, maintenance etc.
- KU11.** organisational standard practices for performing maintenance activities
- KU12.** the various inspection methods for inspecting the quality of machined product

Generic Skills (GS)

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

- GS1.** read and interpret drawings, charts and machine readings
- GS2.** communicate using terms, names, grades and other nomenclature pertaining to the automotive trade
- GS3.** communicate effectively at the workplace
- GS4.** attentively listen and comprehend the information given by the lead technician/team members
- GS5.** write observations and any work related information in English/regional language
- GS6.** recognise a workplace problem and take suitable action
- GS7.** analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
- GS8.** plan and organize tools, machines and consumables for carrying out machining job
- GS9.** complete the assigned tasks with minimum supervision

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare for grinding operations</i>	14	24	-	11
PC1. identify the final output product based on engineering drawing	2	1	-	1
PC2. identify the tools, measuring instruments and input materials required for the job	2	2	-	2
PC3. check the raw material, tools and equipment for any defects and that they are as per the required quality standards	2	4	-	2
PC4. follow the tooling instructions for fixtures, cutting tools, jigs, gauges etc., as specified in the Operating Manual/Work Instructions and collect all the required items from the store	2	4	-	2
PC5. set-up the conventional grinding machine to perform grinding activities	2	5	-	2
PC6. mount, install and align tools, attachments and fixtures on machine by using hand tools and precision measuring instruments	2	5	-	1
PC7. lift the work piece/metal stock manually or by hoist, position the same securely on the machine with grinding wheels by using workholding devices and verify their positions with measuring instruments if required	2	3	-	1
<i>Perform grinding operations</i>	7	12	-	4
PC8. set the grinding parameters such as wheel revolutions, wheel approach speed, feed rate, etc. and position cutting tool and work piece as per work instructions	3	3	-	2
PC9. start the grinding machine, produce the component and inspect the first-run piece for conformance to specifications by using precision gauges	3	5	-	2
PC10. run the machine for mass production of components, if the first run-piece meets the specified requirements	1	4	-	-
<i>Perform post-machining operations</i>	9	14	-	5

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. check the component as per the control plan, work instructions for product quality	2	3	-	-
PC12. note down the observations of the basic inspection process and identify pieces which are as per the specified standards	1	2	-	1
PC13. separate the completed pieces into Ok pieces and defective pieces which can be repaired/reworked and pieces which are beyond repair and maintain records of each category	2	3	-	-
PC14. observe the machine operations for any malfunctions/defects in the component and immediately inform the supervisor/maintenance team for correction	2	3	-	2
PC15. replace worn out grinding wheels timely and safely with new wheels and perform minor maintenance activities	2	3	-	2
NOS Total	30	50	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N3539
NOS Name	Perform grinding operations on conventional lathe
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Machining Operation
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	18/11/2020
Next Review Date	18/11/2025
NSQC Clearance Date	29/01/2021

ASC/N3538: Perform milling operations on conventional lathe

Description

This NOS unit is about performing and finishing milling on the Conventional/Manual lathe machine as per the given work order and the standards specified by the organization.

Scope

The scope covers the following :

- Prepare for milling operations
- Perform milling operations
- Perform post-machining operations

Elements and Performance Criteria

Prepare for Milling operations

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

- PC1.** identify the final output product based on engineering drawing
- PC2.** identify the tools, measuring instruments and input materials required for the job
- PC3.** check the raw material, tools and equipment for any defects and that they are as per the required quality standards
- PC4.** follow the tooling instructions for fixtures, cutting tools, jigs, gauges etc., as specified in the Operating Manual/Work Instructions and collect all the required items from the store
- PC5.** set-up the conventional milling machine to perform various milling activities such as face milling, side milling, angle milling of parts, etc.
- PC6.** adjust the machine controls to ensure conformance with the specified tolerances
- PC7.** mount, install and align tools, attachments and fixtures on machine by using hand tools and precision measuring instruments
- PC8.** lift the work piece/metal stock manually or by hoist, position the same securely on the machine bed by using workholding devices and verify their positions with measuring instruments if required
- PC9.** select and install pre-set toolings in tool posts

Perform milling operations

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

- PC10.** set the machine parameters like cutting speed, depth of cut and feed rate and position cutting tool and work piece as per work instructions
- PC11.** move cutter or turning hand wheel manually for machining the work piece as per the required specifications
- PC12.** set angular cutting by indexing the milling head on milling machine as required
- PC13.** start the milling machine, produce the component and inspect the first-run piece for conformance to specifications by using precision gauges
- PC14.** run the machine for mass production of components, if the first run-piece meets the specified requirements

Perform post machining operations

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

- PCI5.** check the component as per the control plan, work instructions for product quality
- PCI6.** note down the observations of the basic inspection process and identify pieces which are as per the specified standards
- PCI7.** separate the completed pieces into Ok pieces and defective pieces which can be repaired/reworked and pieces which are beyond repair and maintain records of each category
- PCI8.** observe the machine operations for any malfunctions/defects in the component and immediately inform the supervisor/maintenance team for correction
- PCI9.** replace worn out tools timely and safely with new tools and perform minor maintenance activities

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** Standard Operating Procedures (SOP) for operating the milling machine
- KU2.** the process flow of the various milling operations
- KU3.** SOP recommended by the manufacturer for using tools, jigs, fixtures, measuring instruments etc. used during the machining processes
- KU4.** the impact of various machining parameters on the final product
- KU5.** the use of various cutting tools for different machining operations
- KU6.** the use of tools such as chuck, collet, angle piece, clamping elements like studs, T-nut, T-bolt, fly nuts etc., vice, jig and fixture, milling cutters, pallet shuttles, taper sleeves and holders
- KU7.** how to load and unload machine parts safely
- KU8.** SOP recommended by the organisation for checking irregularities in the product/work piece
- KU9.** how to compute unspecified dimensions and machine settings
- KU10.** safety requirements for machine and tools during the machining work
- KU11.** the post machining processes like inspection, cleaning, maintenance etc.
- KU12.** the organisational standard practices for performing maintenance activities
- KU13.** the various inspection methods for inspecting the quality of machined product

Generic Skills (GS)

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

- GS1.** read and interpret drawings, charts and machine readings
- GS2.** communicate using terms, names, grades and other nomenclature pertaining to the automotive trade
- GS3.** communicate effectively at the workplace
- GS4.** attentively listen and comprehend the information given by the lead technician/team members
- GS5.** write observations and any work related information in English/regional language
- GS6.** recognise a workplace problem and take suitable action

- GS7.** analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
- GS8.** plan and organize tools, machines and consumables for carrying out machining job
- GS9.** complete the assigned tasks with minimum supervision

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare for Milling operations</i>	16	22	-	11
PC1. identify the final output product based on engineering drawing	2	1	-	1
PC2. identify the tools, measuring instruments and input materials required for the job	2	3	-	2
PC3. check the raw material, tools and equipment for any defects and that they are as per the required quality standards	2	2	-	1
PC4. follow the tooling instructions for fixtures, cutting tools, jigs, gauges etc., as specified in the Operating Manual/Work Instructions and collect all the required items from the store	2	2	-	1
PC5. set-up the conventional milling machine to perform various milling activities such as face milling, side milling, angle milling of parts, etc.	2	3	-	2
PC6. adjust the machine controls to ensure conformance with the specified tolerances	1	3	-	1
PC7. mount, install and align tools, attachments and fixtures on machine by using hand tools and precision measuring instruments	2	3	-	1
PC8. lift the work piece/metal stock manually or by hoist, position the same securely on the machine bed by using workholding devices and verify their positions with measuring instruments if required	2	3	-	2
PC9. select and install pre-set toolings in tool posts	1	2	-	-
<i>Perform milling operations</i>	6	15	-	3
PC10. set the machine parameters like cutting speed, depth of cut and feed rate and position cutting tool and work piece as per work instructions	1	3	-	1
PC11. move cutter or turning hand wheel manually for machining the work piece as per the required specifications	1	3	-	1
PC12. set angular cutting by indexing the milling head on milling machine as required	1	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PCI3. start the milling machine, produce the component and inspect the first-run piece for conformance to specifications by using precision gauges	2	4	-	-
PCI4. run the machine for mass production of components, if the first run-piece meets the specified requirements	1	4	-	1
<i>Perform post machining operations</i>	8	13	-	6
PCI5. check the component as per the control plan, work instructions for product quality	2	3	-	-
PCI6. note down the observations of the basic inspection process and identify pieces which are as per the specified standards	1	2	-	2
PCI7. separate the completed pieces into Ok pieces and defective pieces which can be repaired/reworked and pieces which are beyond repair and maintain records of each category	2	3	-	-
PCI8. observe the machine operations for any malfunctions/defects in the component and immediately inform the supervisor/maintenance team for correction	1	2	-	2
PCI9. replace worn out tools timely and safely with new tools and perform minor maintenance activities	2	3	-	2
NOS Total	30	50	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N3538
NOS Name	Perform milling operations on conventional lathe
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Machining Operation
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	18/11/2020
Next Review Date	18/11/2025
NSQC Clearance Date	29/01/2021

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) (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 part for each candidate at each examination/training centre (as per assessment criteria below).
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training centre based on these criteria.
5. In case of successfully passing only certain number of NOSs, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.
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 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	10
ASC/N9802.Interact effectively with colleagues, customers and others	50	30	-	20	100	5
ASC/N9805.Interpret engineering drawing	50	30	-	20	100	10
ASC/N3536.Perform turning operations on conventional lathe	30	50	-	20	100	20
ASC/N3537.Perform drilling, reaming, tapping and boring operations on conventional lathe	30	50	-	20	100	20
ASC/N3539.Perform grinding operations on conventional lathe	30	50	-	20	100	20
ASC/N3538.Perform milling operations on conventional lathe	30	50	-	20	100	15
Total	270	290	-	140	700	100

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
SOP	Standard Operating Procedure
CNC	Computerized Numerical Control
RPM	Revolutions Per Minute
MOT	Measurement Over Teeth
PCD	Pitch Circle Diameter

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.

<p>Organisational Context</p>	<p>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.</p>
<p>Technical Knowledge</p>	<p>Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.</p>
<p>Core Skills/ Generic Skills (GS)</p>	<p>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.</p>
<p>Electives</p>	<p>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.</p>
<p>Options</p>	<p>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.</p>