



Model Curriculum

QP Name: Automotive Machining Assistant

QP Code: ASC/Q3502

QP Version: 2.0

NSQF Level: 2

Model Curriculum Version: 1.0

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Training Parameters

Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Machining Operation
Country	India
NSQF Level	2
Aligned to NCO/ISCO/ISIC Code	NCO-2015/9321.1401
Minimum Educational Qualification and Experience	8th Class
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 years (with relaxation to school students, minimum 14 years of age)
Last Reviewed On	18/02/2021
Next Review Date	18/02/2026
NSQC Approval Date	27/05/2021
QP Version	2.0
Model Curriculum Creation Date	18/02/2021
Model Curriculum Valid Up to Date	18/02/2026
Model Curriculum Version	1.0
Minimum Duration of the Course	256 Hours 00 Minutes
Maximum Duration of the Course	256 Hours 00 Minutes

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Perform pre-machining activities such as lifting of workpiece, inspection of tools and equipment etc.
- Demonstrate how to support machining operator during machining operations
- Perform post-machining operations such as inspection, cleaning etc.
- Work effectively and efficiently as per schedules and timelines.
- Implement safety practices.
- Optimize the use of resources to ensure less wastage and maximum conservation.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	08:00	00:00			08:00
Module 1: Introduction to the role of an Automotive Machining Assistant	08:00	00:00			08:00
ASC/N9803 – Organize work and resources (Manufacturing) NOS Version No. – 1.0 NSQF Level – 3	16:00	24:00			40:00
Module 2: Organize work and resources according to safety and conservation standards	16:00	24:00			40:00
ASC/N9802 – Interact effectively with colleagues, customers and others NOS Version No. – 1.0 NSQF Level - 3	12:00	20:00			32:00
Module 3: Communicate effectively and efficiently	12:00	20:00			32:00
ASC/N3501 – Support the machining operator in the routine machining activities NOS Version No. – 2.0 NSQF Level - 2	60:00	116:00			176:00
Module 4: Prepare for machining operations	26:00	54:00			80:00
Module 5: Support in machining and post-machining operations	34:00	62:00			96:00
Total Duration	96:00	160:00			256:00

Module Details

Module Name: Introduction to the role of an Automotive Machining Assistant

Bridge module

Terminal Outcomes:

- Discuss the role and responsibilities of an Automotive Machining Assistant.

Duration: <08:00>	Duration: <00:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the role and responsibilities of an Automotive Machining Assistant. • Discuss the job opportunities of an Automotive Machining Assistant. • Explain about Indian automotive manufacturing market. • List various automobile Original Equipment Manufacturers (OEMs) and different products/ models manufactured by them. • Discuss the standards and procedures involved in the different operations of welding. 	
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module Name: Organize work and resources according to safety and conservation standards

Mapped to ASC/N9803 v1.0

Terminal Outcomes:

- Employ appropriate ways to maintain safe and secure working environment.
- Perform work as per the quality standards.
- Apply conservation practices at the workplace.

Duration: <16:00>	Duration: <24:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the potential workplace related risks and hazards, their causes and preventions. • Identify PPE to be used at workplace. • Identify various warning signs used at the workplace. • Describe appropriate strategies to deal with emergencies and accidents at the workplace. • Outline the organizational structure to be followed to report about health, safety and security breaches to the concerned authorities. • Discuss the importance of keeping work area clean and tidy. • Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol based hand sanitizers or soap. • Discuss organizational hygiene and sanitation guidelines and ways of reporting breaches/gaps if any to the concerned authorities. • Discuss the ways of dealing with stress and anxiety. • Discuss how to complete the given work within the stipulated time period. • Explain how to maintain a proper balance between team and individual goals. • Explain 5S guidelines at workplace. • List the various materials used at the workplace. • Explain organisational recommended procedure for storage of tools, equipment and material after completion of work. • Explain the ways to optimize usage of resources. • Discuss various methods of waste management and its disposal. 	<ul style="list-style-type: none"> • Apply appropriate safety practices to ensure safety of people at the workplace • Display the correct way of wearing and removing PPE such as face masks, hand gloves, face shields, PPE suits, etc. • Demonstrate the use of fire extinguisher. • Apply basic first aid procedure in case of emergencies. • Perform routine cleaning of tools, equipment and machines. • Employ various techniques for checking malfunctions in the equipment as per Standard Operating Procedure (SOP). • Show how to sanitize and disinfect one's work area regularly. • Demonstrate the correct way of washing hands using soap and water. • Demonstrate the correct way of sanitizing hands using alcohol-based hand rubs. • Demonstrate how to evacuate the workplace in case of an emergency. • Demonstrate sorting of materials, tools and equipment and spare parts after completion of work. • Demonstrate the steps involved in storage of tools, equipment and material after completion of work. • Perform basic checks to identify any spills and leaks and that need to be plugged /stopped. • Demonstrate different disposal techniques depending upon types of waste. • Employ different ways to check if equipment/machines are functioning as per requirements and report malfunctioning, if observed. • Employ ways for efficient utilization of

<ul style="list-style-type: none"> • List the different categories of waste for the purpose of segregation • Differentiate between recyclable and non-recyclable waste • State the importance of using appropriate colour dustbins for different types of waste. • Discuss common practices for conserving electricity at workplace. • Discuss the common sources of pollution and ways to minimize it. 	<p>material and water.</p>
<p>Classroom Aids:</p>	
<p>Whiteboard, marker pen, projector</p>	
<p>Tools, Equipment and Other Requirements</p>	
<ul style="list-style-type: none"> • Housekeeping material: Cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel, fire extinguisher • Safety gears: Safety shoes, ear plug, goggles, gloves, helmet, first-aid kit 	

Module 3

Module Name: Communicate Effectively and Efficiently

Mapped to ASC/N9802 v1.0

Terminal Outcomes:

- Use effective communication and interpersonal skills.
- Apply sensitivity while interacting with different genders and people with disabilities.

Duration: <12:00>	Duration: <20:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the organizational structure for communicating with colleagues, seniors and others. • Discuss the ways to adjust the communication styles to reflect sensitivity towards gender and persons with disability (PwD). • Explain the importance of respecting personal space of colleagues. • State the procedure to receive work instructions and report problems to the supervisor. • List the various organizational policies and procedures to be followed at the workplace. • Describe different ways to rectify commonly occurring errors. • Explain the importance of complying with the instructions/guidelines and procedures while performing tasks related to the job specifications. • Discuss the importance of PwD and gender sensitization. 	<ul style="list-style-type: none"> • Employ different means of communication depending upon the requirement while interacting with others. • Demonstrate using new ways to maintain good relationships with colleagues and supervisor. • Prepare a sample report to send the work status to the supervisor. • Demonstrate how to communicate with different genders and persons with disability (PwD) in a sensitive manner.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
Sample of escalation matrix, organisation structure.	

Module 4

Module Name: Prepare for machining operations

Mapped to ASC/N3501 v6.0

Terminal Outcomes:

- Identify tools and equipment required for machining operations.
- Perform the steps to carry out pre-machining activities such as lifting of workpiece, inspection of tools and equipment etc.

Duration: <28:00>	Duration: <52:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Elucidate various types of machining processes such as drilling, boring, turning etc. • List common terminologies used in machining work. • List tools, measuring instruments, equipment, jigs, fixtures and input material required during machining work. • Discuss the organisational process of collecting and arranging tools, equipment, accessories, measuring instruments and input material from the store. • Identify machine parts and tools required during different machining operations. • Summarise the steps to be performed for checking the input material, tools and equipment for defects and quality compliance. • Recall the steps to be performed for setting of the tools, fixtures/jigs and cutting tools on the machine while assisting the machine operator. 	<ul style="list-style-type: none"> • Apply appropriate ways of checking the input material, tools and equipment for defects and quality standards before use. • Demonstrate the standard operating procedure to use tools, equipment, jigs, fixtures and measuring instruments required during job. • Show how to support the machining operator in setting of the tools, fixtures/jigs and cutting tools on the machine.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
<ul style="list-style-type: none"> • Basic tool box, Work bench with vice • Machining tools/ equipment: Surface marking plate, cutting tools, threading, dies & guides, etc. • Machines: Conventional lathe and vertical milling machine with standard accessories and Production CNC machining center with ATC • Measuring equipment: Vernier calipers, micrometre, feeler gauges, bore gauge, slip gauge, thickness gauge, steel ruler, measuring tape, height, gauge, dial gauge, angle plate, set square compass etc. 	

- Consumables: Oil stones, Emery, Dressing stone, File cord, Tool post packing, Spares for cutting tools, Carbide inserts, Grinding Wheels etc.
- Hand book, job orders, work order, completion material requests, and Technical Reference Books.
- Sample of Rejected parts for defects like dent, scratch, damage and burrs
- Safety materials: Fire extinguisher, helmet, leather safety gloves, leather aprons, safety glasses with side shields, ear plug, safety shoes and first-aid kit
- Cleaning material: Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel

Module 5

Module Name: Support in machining and post-machining operations

Mapped to ASC/N3501 v6.0

Terminal Outcomes:

- Demonstrate how to support machining operator during machining operations.
- Perform the steps to carry out post-machining activities.

Duration: <36:00>	Duration: <60:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List ways for safe handling of work pieces and machine auxiliaries during loading. • Discuss ways to fix or clamp the work pieces on the machine. • Summarise the steps of unloading, extracting jammed pieces and placing the machined components on the designated place as per the work instructions. • Explain the process of checking the irregularities of product/work piece as per the specified quality standards. • List the safety practices to avoid any hazard and accident during welding activities. • Elucidate the process of segregating, tagging and storing of damaged and ok workpieces as per organisational guidelines. • Discuss various cleaning methods to clean the tools, equipment, process auxiliaries and work area. • Recall organisational recommended procedure for storage of the tools, equipment and process auxiliaries after completion of work. • List different methods for disposing off waste material. 	<ul style="list-style-type: none"> • Show how to load the work pieces and machine auxiliaries securely on the machine manually or by using lifting equipment. • Demonstrate how to fix or clamp the work pieces on the machine as per the requirements. • Show how to hold the tools appropriately during machining operations. • Perform the steps of unloading machined components and extracting jammed pieces from machine by using lifting tools while assisting the machine operator. • Show how to support machining operator in segregating, tagging and storing of the machined pieces as per organisational guidelines. • Perform the steps of moving and placing machined components to the designated place. • Apply appropriate cleaning methods to clean the tools, equipment and process auxiliaries after completion of work. • Demonstrate the organisational procedure involved in storage of tools, equipment and process auxiliaries after completion of work. • Apply appropriate ways to remove chips from different machine areas and clean the work area. • Show how to dispose waste as per organisational guidelines.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
<ul style="list-style-type: none"> • Basic tool box, Work bench with vice 	

- Machining tools/ equipment: Surface marking plate, cutting tools, threading, dies & guides, etc.
- Machines: Conventional lathe and vertical milling machine with standard accessories and Production CNC machining center with ATC
- Measuring equipment: Vernier calipers, micrometre, feeler gauges, bore gauge, slip gauge, thickness gauge, steel ruler, measuring tape, height, gauge, dial gauge, angle plate, set square compass etc.
- Consumables: Oil stones, Emery, Dressing stone, File cord, Tool post packing, Spares for cutting tools, Carbide inserts, Grinding Wheels etc.
- Hand book, job orders, work order, completion material requests, and Technical Reference Books.
- Sample of Rejected parts for defects like dent, scratch, damage and burrs
- Safety materials: Fire extinguisher, helmet, leather safety gloves, leather aprons, safety glasses with side shields, ear plug, safety shoes and first-aid kit
- Cleaning material: Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
ITI	Machinist/Turner	2	Machining	1	Machining	NA
ITI	Machinist/Turner	3	Machining	0	Machining	NA
Certificate NSQF- Level 4	Automotive Machining Technician	2	Machining	1	Machining	NA
Diploma	Mechanical/Automobile	1	Machining	1	Machining	NA
Diploma	Mechanical/Automobile	2	Machining	0	Machining	NA

Trainer Certification	
Domain Certification	Platform Certification
“Automotive Machining Assistant, ASC/Q3502, version 2.0”. Minimum accepted score is 80%.	“Trainer, MEP/Q2601 v1.0” Minimum accepted score is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
ITI	Machinist/Turner	3	Machining	1	Machining	NA
ITI	Machinist/Turner	4	Machining	0	Machining	NA
Certificate NSQF- Level 4	Automotive Machining Technician	3	Machining	1	Machining	NA
Diploma	Mechanical/Automobile	2	Machining	1	Machining	NA
Diploma	Mechanical/Automobile	3	Machining	0	Machining	NA

Assessor Certification	
Domain Certification	Platform Certification
“Automotive Machining Assistant, ASC/Q3502, version 2.0”. Minimum accepted score is 80%.	“Assessor; MEP/Q2701 v1.0” Minimum accepted score is 80%.

Assessment Strategy

1. Assessment System Overview:
 - Batches assigned to the assessment agencies for conducting the assessment on SDMS/SIP or email
 - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
 - Assessment agency deploys the ToA certified Assessor for executing the assessment
 - SSC monitors the assessment process & records
2. Testing Environment:
 - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
 - Check the duration of the training.
 - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
 - If the batch size is more than 30, then there should be 2 Assessors.
 - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
 - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
 - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
 - Check the availability of the Lab Equipment for the particular Job Role.
3. Assessment Quality Assurance levels / Framework:
 - Question papers created by the Subject Matter Experts (SME)
 - Question papers created by the SME verified by the other subject Matter Experts
 - Questions are mapped with NOS and PC
 - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
 - Assessor must be ToA certified & trainer must be ToT Certified
 - Assessment agency must follow the assessment guidelines to conduct the assessment
4. Types of evidence or evidence-gathering protocol:
 - Time-stamped & geotagged reporting of the assessor from assessment location
 - Centre photographs with signboards and scheme specific branding
 - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
 - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos
5. Method of verification or validation:
 - Surprise visit to the assessment location
 - Random audit of the batch
 - Random audit of any candidate
6. Method for assessment documentation, archiving, and access
 - Hard copies of the documents are stored
 - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
 - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
SOP	Standard Operating Procedure
WI	Work Instructions
PPE	Personal Protective equipment