# Model Curriculum

**QP Name: Automotive Casting Technician**

**QP Code: ASC/Q3205**

**QP Version: 2.0**

**NSQF Level: 4**

**Model Curriculum Version: 2.0**

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

# Table of Contents

# Training Parameters

| | |
|---|---|
| **Sector** | Automotive |
| **Sub-Sector** | Manufacturing |
| **Occupation** | Casting Operation |
| **Country** | India |
| **NSQF Level** | 4 |
| **Aligned to NCO/ISCO/ISIC Code** | NCO-2015/7211.0201 |
| **Minimum Educational Qualification and Experience** | 12th Class with 1 Year of relevant experience<br>OR<br>10th Class+ 1 year ITI with 2 years of experience<br>OR<br>10th Class+ 2 year ITI with 1 year of experience<br>OR<br>Certificate- NSQF ((Automotive Casting Operator Level 3) with 2 years of experience |
| **Pre-Requisite License or Training** | NA |
| **Minimum Job Entry Age** | 18 years |
| **Last Reviewed On** | 31/08/2021 |
| **Next Review Date** | 31/08/2024 |
| **NSQC Approval Date** | 31/08/2021 |
| **QP Version** | 2.0 |
| **Model Curriculum Creation Date** | 31/08/2021 |
| **Model Curriculum Valid Up to Date** | 31/08/2024 |
| **Model Curriculum Version** | 2.0 |
| **Minimum Duration of the Course** | 400 Hours 00 Minutes |
| **Maximum Duration of the Course** | 400 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.

- Interpret the drawing/work instructions/SOPs for identification of raw material, tools and equipment required for the casting operations.
- Carry out pre-casting activities such as lifting of workpiece, inspection of tools and equipment etc. in co-ordination with Casting Technician.
- Carry out casting operations such as sand making, mould making, core making and casting.
- Perform trimming and fettling operations.
- Carry out post-casting operations such as cleaning and inspection.
- 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** | | | | | |
| Module 1: Introduction to the role of an Automotive Casting Operator | 8:00 | 0:00 | | | 8:00 |
| **ASC/N9803 – Organize work and resources (Manufacturing)<br>NOS Version No. – 1.0<br>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<br>NOS Version No. – 1.0<br>NSQF Level - 3** | **12:00** | **20:00** | | | **32:00** |
| Module 3: Communicate effectively and efficiently | 12:00 | 20:00 | | | 32:00 |
| **ASC/N3214 – Prepare for casting process<br>NOS Version No. – 2.0<br>NSQF Level - 4** | **40:00** | **64:00** | | | **104:00** |
| Module 4: Prepare for casting process | 40:00 | 64:00 | | | 104:00 |

| | | | | | |
|---|---|---|---|---|---|
| **ASC/N3215 – Perform various casting operations NOS Version No. – 2.0 NSQF Level - 4** | **32:00** | **88:00** | | | **120:00** |
| Module 5:<br>Perform casting activities | 32:00 | 88:00 | | | 120:00 |
| **ASC/N3216 – Perform post casting operations NOS Version No. – 2.0 NSQF Level - 4** | **32:00** | **64:00** | | | **96:00** |
| Module 6:<br>Perform post-casting activities | 32:00 | 64:00 | | | 96:00 |
| **Total Duration** | **140:00** | **260:00** | | | **400:00** |

# Module Details

## Module 1: Introduction to the role of an Automotive Casting Technician

### *Bridge module*

**Terminal Outcomes:**

- Discuss the role and responsibilities of an Automotive Casting Technician

| **Duration**: *<08:00>* | **Duration**: *<00:00>* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| • List the role and responsibilities of an Automotive Casting Technician.<br>• Discuss the job opportunities of an Automotive Casting Technician in an automobile industry.<br>• Explain about Indian automotive market.<br>• List various automobile Original Equipment Manufacturers (OEMs) and different products/ models manufactured by them.<br>• Discuss the standards and procedures involved in the different processes of casting.<br>• Identify the standard checklists and schedules recommended by OEM. | |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
| | |

## Module 2: 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** |
| • List the potential workplace related risks and hazards, their causes and preventions.<br>• Identify PPE to be used at workplace.<br>• Identify various warning signs used at the workplace.<br>• Describe appropriate strategies to deal with emergencies and accidents at the workplace.<br>• Outline the organizational structure to be followed to report about health, safety and security breaches to the concerned authorities.<br>• Discuss the importance of keeping work area clean and tidy.<br>• Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol based hand sanitizers or soap.<br>• Discuss organizational hygiene and sanitation guidelines and ways of reporting breaches/gaps if any to the concerned authorities.<br>• Discuss the ways of dealing with stress and anxiety.<br>• Discuss how to complete the given work within the stipulated time period.<br>• Explain how to maintain a proper balance between team and individual goals.<br>• Explain 5S guidelines at workplace.<br>• List the various materials used at the workplace.<br>• Explain organisational recommended procedure for storage of tools, equipment and material after completion of work.<br>• Explain the ways to optimize usage of resources.<br>• Discuss various methods of waste management and its disposal. | • Apply appropriate safety practices to ensure safety of people at the workplace<br>• Display the correct way of wearing and removing PPE such as face masks, hand gloves, face shields, PPE suits, etc.<br>• Demonstrate the use of fire extinguisher.<br>• Apply basic first aid procedure in case of emergencies.<br>• Perform routine cleaning of tools, equipment and machines.<br>• Employ various techniques for checking malfunctions in the equipment as per Standard Operating Procedure (SOP).<br>• Show how to sanitize and disinfect one's work area regularly.<br>• Demonstrate the correct way of washing hands using soap and water.<br>• Demonstrate the correct way of sanitizing hands using alcohol-based hand rubs.<br>• Demonstrate how to evacuate the workplace in case of an emergency.<br>• Demonstrate sorting of materials, tools and equipment and spare parts after completion of work.<br>• Demonstrate the steps involved in storage of tools, equipment and material after completion of work.<br>• Perform basic checks to identify any spills and leaks and that need to be plugged /stopped.<br>• Demonstrate different disposal techniques depending upon types of waste.<br>• Employ different ways to check if equipment/machines are functioning as per requirements and report malfunctioning, if observed.<br>• Employ ways for efficient utilization of material and water. |

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| • List the different categories of waste for the purpose of segregation<br>• Differentiate between recyclable and non-recyclable waste<br>• State the importance of using appropriate colour dustbins for different types of waste.<br>• Discuss common practices for conserving electricity at workplace.<br>• Discuss the common sources of pollution and ways to minimize it. | |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
| • Housekeeping material: Cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel, fire extinguisher<br>• Safety gears: Safety shoes, ear plug, goggles, gloves, helmet, first-aid kit | |

## Module 3: 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** |
| • Explain the organizational structure for communicating with colleagues, seniors and others.<br>• Discuss the ways to adjust the communication styles to reflect sensitivity towards gender and persons with disability (PwD).<br>• Explain the importance of respecting personal space of colleagues.<br>• State the procedure to receive work instructions and report problems to the supervisor.<br>• List the various organizational policies and procedures to be followed at the workplace.<br>• Describe different ways to rectify commonly occurring errors.<br>• Explain the importance of complying with the instructions/guidelines and procedures while performing tasks related to the job specifications.<br>• Discuss the importance of PwD and gender sensitization. | • Employ different means of communication depending upon the requirement while interacting with others.<br>• Demonstrate using new ways to maintain good relationships with colleagues and supervisor.<br>• Prepare a sample report to send the work status to the supervisor.<br>• 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: Prepare for casting process

### *Mapped to ASC/N3214, v2.0*

**Terminal Outcomes:**

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

| **Duration**: *<40:00>* | **Duration**: *<64:00>* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| • Describe different types of casting processes.<br>• Describe various processes such as furnace operation, melting process, charging method and safety process of handling hot liquid iron, furnace lining process etc.<br>• Describe various mechanical and heat laws applicable on casting.<br>• Discuss the information such as specifications and dimensions of output and type of sand to be used for core and mould derived from the engineering drawings, work order, SOPs and instructions from supervisor.<br>• List the tools, casting machine, equipment, consumables, dies and input materials required during casting work.<br>• List different types of sand used for preparing core and mould.<br>• Discuss the selection criteria of tools, casting machine, equipment, consumables, dies and input materials required.<br>• Discuss the organisational process of collecting and storing the tools, casting machine, equipment, consumables, dies and input materials from the store.<br>• Discuss the necessary precautions to avoid any hazard and accident during casting activities.<br>• Summarise the steps to be performed for checking and cleaning the input material, tools and equipment before use.<br>• Discuss casting parameters like sand properties - GCS, compatibility, clay and moisture percentage, squeeze pressure, metal temperature, inoculation addition, cooling time, casting hardness, tensile strength, elongation and microstructure | • Show how to select the latest version of the available engineering drawing to get the final required dimensions of product.<br>• Demonstrate the standard operating procedure to use tools, casting machine and equipment required during casting process.<br>• Show how to select and collect the required tools, equipment, consumables, dies and input materials from the store.<br>• Apply appropriate ways to check and clean the input material, tools and equipment before use.<br>• Show how to set the casting apparatus and its parameters as per the SOP.<br>• Show how to support the casting operator during lifting and placing the workpieces on casting line by using lifting tools. |

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| requirement etc. and their impact on output.<br>• Discuss the process of lifting and placing the workpieces on casting line as per the work instructions. | |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
| • PPT's, teaching aids, drawing / blue print, work order<br>• **Raw Materials:** Sand, die<br>• **Machinery:** Moulding machine, Casting machine, Die Casting machine, Casting die, Trim press , Shot blasting machine, mixers, hoppers, feeders etc.<br>• **Auxiliaries:** spatulas, chippers etc.<br>• **Fuel:** Charcoal<br>• **Measuring Tools:** Steel tape, Steel rule, Vernier calliper, Micrometer, Compass<br>• **Cutting Tools:** Hacksaw frame adjustable, chisel, scissor, Sand paper<br>• **Driving Tools:** Chipping hammer, wooden mallet<br>• **Lifting devices:** Hoists, cranes, bins, part trolleys, pallet trucks<br>• **Safety materials**: Fire extinguisher, portable welding curtains, leather safety gloves, leather aprons, safety glasses, helmet, safety shoe and first-aid kit<br>• **Cleaning material**: Wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel | |

## Module 5: Perform casting activities

### *Mapped to ASC/N3215, v2.0*

**Terminal Outcomes:**

- Demonstrate various casting processes such as sand making, mould making, core making and casting.
- Perform steps to carry out fettling and trimming operation.

| **Duration**: *<32:00>* | **Duration**: *<88:00>* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| • List the steps to be performed for sand making process.<br>• Recall properties of sand and other additives used.<br>• Discuss the importance of monitoring process parameters during the sand feeding and mixing process and correcting them as per the requirements.<br>• List the steps to be performed for core making process.<br>• Discuss the parameters such as temperature, pressure etc. need to maintain during core making and their impact on the core.<br>• Discuss the importance of monitoring process parameters during the core making and mould making process and correcting them as per the requirements.<br>• Discuss the importance of proper hardening of core.<br>• Discuss the process of unloading the core from machine as per the work instructions.<br>• List different types of paints to be used for painting the core.<br>• List the steps to be performed for mould making process.<br>• Discuss the parameters such as temperature, pressure etc. need to maintain during mould making and their impact on the core.<br>• List the steps to be performed for making mould box.<br>• Discuss the effect of loose or improperly fixed two halves of mould box during molten metal pouring process.<br>• List the steps to be performed for casting process. | • Role play a situation on how to instruct the casting operator for pouring the sand into mixer during the sand making process, pouring the sand and additives into die during core and mould making, pouring the molten metal into the mould during casting activities and turning the valves of machines to maintain the flow of material.<br>• Show how to feed the additives in the mixer as per the Work Instructions/ SOPs.<br>• Demonstrate organizational specified procedure of sand making process.<br>• Read the measurement gauges and monitor the sand feeding and mixing process parameters to maintain the quality standards.<br>• Apply appropriate ways to check the quality of output sand in terms of grain compressive strength etc.<br>• Demonstrate organizational specified procedure of core making process.<br>• Show how to adjust the temperature, pressure and other parameters of machine as per the requirement for core making.<br>• Show how to feed the additives in the mixer as per the Work Instructions/ SOPs.<br>• Read the measurement gauges and monitor the core making process parameters to maintain the quality standards.<br>• Apply appropriate ways to create hot vapour during core making process for the proper hardening of core.<br>• Apply appropriate ways to check the quality of output sand in terms of grain compressive strength etc.<br>• Show how to support the casting operator during unloading of core from the machine by using lifting tools. |

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| • Discuss the importance of maintaining down sprue always into full condition during pouring process.<br>• Discuss the importance of monitoring process parameters during the casting process and correcting them as per the requirements.<br>• Discuss the process of unloading the cast from machine as per the work instructions.<br>• Describe fettling and trimming operation.<br>• Describe the impact of runners & risers on the surfaces and final output.<br>• List the tools such as swing frame or pedestal grinders, chipping tools, hammers, hand saws, pneumatic or electrical tools etc. required for manual fettling.<br>• List the steps to be performed for fettling and trimming operation. | • Perform steps to prepare the water based paint and apply coat of paint on it by dipping in paint tank.<br>• Apply appropriate ways to heat the painted core for hardening purpose.<br>• Demonstrate use of shot blasting machine for removing dust particles and unwanted material from core.<br>• Employ appropriate ways of measuring and comparing the final core with the specified dimensions in the work order and engineering drawing.<br>• Show how to adjust the temperature, pressure and other parameters of machine as per the requirement for mould making.<br>• Demonstrate organizational specified procedure of starting the pressing machine and performing various pressing operations for mould preparation.<br>• Read the measurement gauges and monitor the mould making process parameters to maintain the quality standards.<br>• Demonstrate organizational specified procedure of preparing the mould box for casting of metal.<br>• Employ appropriate ways of measuring and comparing the final mould pattern with the specified dimensions in the work order and engineering drawing.<br>• Demonstrate organizational specified procedure of casting process.<br>• Apply appropriate ways to maintain the down sprue in full condition during pouring process as per the WI/SOP.<br>• Read the measurement gauges and monitor the casting process parameters to maintain the quality standards.<br>• Show how to take out the entire mould with solidified metal from the machine and remove the sand from metal casting.<br>• Perform steps to trim the cast for removing fins, flashes and excess metal from the surface of casted workpiece.<br>• Apply appropriate ways to remove any dirt, sand, excess metal etc. from the casted workpiece.<br>• Employ appropriate ways of measuring and comparing casted piece dimensions with the specified dimensions in the job orders.<br>• Show how to shape the metal casting as per the required measurements. |

| Classroom Aids: |
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| Whiteboard, marker pen, projector |
| **Tools, Equipment and Other Requirements** |
| • PPT's, teaching aids, drawing / blue print, work order<br>• **Raw Materials:** Sand, die<br>• **Machinery:** Moulding machine, Casting machine, Die Casting machine, Casting die, Trim press , Shot blasting machine, mixers, hoppers, feeders etc.<br>• **Auxiliaries:** spatulas, chippers etc.<br>• **Fuel:** Charcoal<br>• **Measuring Tools:** Steel tape, Steel rule, Vernier calliper, Micrometer, Compass<br>• **Cutting Tools:** Hacksaw frame adjustable, chisel, scissor, Sand paper<br>• **Driving Tools:** Chipping hammer, wooden mallet<br>• **Lifting devices:** Hoists, cranes, bins, part trolleys, pallet trucks<br>• **Safety materials**: Fire extinguisher, portable welding curtains, leather safety gloves, leather aprons, safety glasses, helmet, safety shoe and first-aid kit<br>• **Cleaning material**: Wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel |

## Module 6: Perform post-casting activities

### *Mapped to ASC/N3216, v2.0*

**Terminal Outcomes:**

- Identify requirements for shot blasting and post-casting activities
- Perform steps to carry out shot blasting process.
- Perform steps to carry out post-casting activities.

| **Duration**: *<32:00>* | **Duration**: *<64:00>* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| • Describe shot blasting process.<br>• Discuss the process of loading/unloading and placing the workpieces from shot blasting machine as per the work instructions.<br>• Discuss post-casting activities like inspection, cleaning, maintenance etc.<br>• Explain methods of inspecting the quality of casted workpieces.<br>• List the commonly occurring defects in the casted workpieces.<br>• Discuss various processes i.e. fettling, chipping, cutting, sawing, filling, shearing, hammering for removing defects in casted workpiece.<br>• Discuss the process of segregating, tagging and storing of damaged and ok workpieces and maintaining records of segregation as per organisational guidelines.<br>• List the steps to be performed for checking the machine operations for any defects in its component and informing the supervisor.<br>• List different methods for disposing off waste material and scrap.<br>• Discuss documents and records needed to prepare and update related to casting work.<br>• List the steps to be performed for sending the workpieces to lab for quality check and obtaining batch clearance | • Show how to clean the shot blasting machine by using air pressure.<br>• Apply appropriate ways to check the shot blasting machine and its components for before use.<br>• Perform the steps of lifting and placing the workpieces and shots on shot blasting machine manually or by using lifting tools.<br>• Demonstrate organizational specified procedure of starting the shot blasting machine and performing the shot blasting process.<br>• Apply appropriate ways to check that machine is in the moving position till the cycle time for both sides cycle is achieved.<br>• Perform the steps of lifting the workpieces from shot blasting machine and placing them on trolleys manually or by using lifting tools.<br>• Employ appropriate ways for comparing the casted piece texture, color, surface properties, hardness and strength with the specified product specifications.<br>• Apply appropriate inspection methods for identifying the defects, checking the quality of casted workpieces and noting the observations of inspection process as per the control plan.<br>• Demonstrate the standard operating procedure to use measurement instruments like rulers, Vernier calipers, micrometer, weighing scale, gauges and other inspection equipment<br>• Show how to remove the minor defects like excess slag, shape deformation, sharp edges, rough surfaces, grooves, holes etc. by performing various processes such as fettling, chipping, cutting, sawing, filling, shearing, hammering.<br>• Demonstrate how to check that finished workpieces are segregated, tagged and stored and data of damaged and ok workpieces is recorded as per organisational guidelines. |

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|---|---|
| | • Employ appropriate ways for checking the machine operations for any defects in the component.<br>• Show how to clean the tools, casting apparatus and shot blasting machine after completion of work.<br>• Show how to dispose scrap or waste as per organisational guidelines.<br>• Demonstrate organisational specified procedure of sending first and last work piece from each batch to the lab for quality check and obtaining batch clearance. |
| **Classroom Aids:** | |
| Whiteboard, marker pen, projector | |
| **Tools, Equipment and Other Requirements** | |
| • PPT's, teaching aids, drawing / blue print, work order<br>• **Raw Materials:** Sand, die<br>• **Machinery:** Moulding machine, Casting machine, Die Casting machine, Casting die, Trim press , Shot blasting machine, mixers, hoppers, feeders etc.<br>• **Auxiliaries:** spatulas, chippers etc.<br>• **Fuel:** Charcoal<br>• **Measuring Tools:** rulers, Vernier calipers, micrometer, weighing scale, gauges<br>• **Cutting Tools:** Hacksaw frame adjustable, chisel, scissor, Sand paper<br>• **Driving Tools:** Chipping hammer, wooden mallet<br>• **Lifting devices:** Hoists, cranes, bins, part trolleys, pallet trucks<br>• **Safety materials**: Fire extinguisher, portable welding curtains, leather safety gloves, leather aprons, safety glasses, helmet, safety shoe and first-aid kit<br>• **Cleaning material**: 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 | Fitter/Turner | 3 | Casting | 1 | Casting | NA |
| ITI | Fitter/Turner | 4 | Casting | 0 | Casting | NA |
| Diploma | Mechanical/ Automobile | 2 | Casting | 1 | Casting | NA |
| Diploma | Mechanical/ Automobile | 3 | Casting | 0 | Casting | NA |

| Trainer Certification | |
|---|---|
| **Domain Certification** | **Platform Certification** |
| "Automotive Casting Technician, ASC/Q3205, version 2.0".<br>Minimum accepted score is 80%. | "Trainer, MEP/Q2601 v1.0"<br>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 | Fitter/Turner | 4 | Casting | 1 | Casting | NA |
| ITI | Fitter/Turner | 5 | Casting | 0 | Casting | NA |
| Diploma | Mechanical/ Automobile | 3 | Casting | 1 | Casting | NA |
| Diploma | Mechanical/ Automobile | 4 | Casting | 0 | Casting | NA |

| Assessor Certification | |
|---|---|
| **Domain Certification** | **Platform Certification** |
| "Automotive Casting Technician, ASC/Q3205, version 2.0".<br>Minimum accepted score is 80%. | "Assessor; MEP/Q2701 v1.0"<br>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 |