



# Model Curriculum

**QP Name: Automotive Open System (AUTOSAR) Engineer**

**QP Code: ASC/Q8309**

**QP Version: 1.0**

**NSQF Level: 6**

**Model Curriculum Version: 1.0**

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## Training Parameters

<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Manufacturing
<b>Occupation</b>	Automotive Product Development
<b>Country</b>	India
<b>NSQF Level</b>	6
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/7213.0201
<b>Minimum Educational Qualification and Experience</b>	3 years diploma (Mechanical/Automobile/ Electrical / Electronics/ Computer Science/ IT) after class 10th or BCA from recognized regulatory body with 5 years of relevant (like Automotive embedded system) experience OR B.E./B.Tech/ MCA in the relevant field with 1 Year of relevant experience, OR M.E./M.Tech in the relevant field OR Certificate-NSQF (Automotive Prototype Manufacturing Lead Technician/ Electric Vehicle Product Design Engineer Level 5) with 3 Years of relevant experience
<b>Pre-Requisite License or Training</b>	Basic of Microcontrollers Automobile ECU functionality Embedded C Course
<b>Minimum Job Entry Age</b>	22 years
<b>Last Reviewed On</b>	17/11/2022
<b>Next Review Date</b>	17/11/2025
<b>NSQC Approval Date</b>	17/11/2022
<b>QP Version</b>	1.0
<b>Model Curriculum Creation Date</b>	17/11/2022
<b>Model Curriculum Valid Up to Date</b>	17/11/2025
<b>Model Curriculum Version</b>	1.0
<b>Minimum Duration of the Course</b>	630 Hours
<b>Maximum Duration of the Course</b>	630 Hours

## 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 steps to build AUTOSAR architecture and its architecture.
- Perform steps to configure software components as per the project requirements.
- Perform steps to develop and validate codes of AUTOSAR tools and project.
- Implement safety practices.
- Use resources optimally to ensure less wastage and maximum conservation.
- Communicate effectively and develop interpersonal skills.

### 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
<b>Bridge Module</b>					
Module 1: Introduction to the role of an Automotive Open System (AUTOSAR) Engineer	5:00	0:00			5:00
<b>ASC/N9810: Manage work and resources (Manufacturing) NOS Version No. – 1.0 NSQF Level – 5</b>	<b>20:00</b>	<b>40:00</b>			<b>60:00</b>
Module 2: Manage work and resources according to safety and conservation standards	20:00	40:00			60:00
<b>DGT/VSQ/N0103 - Employability Skills (90 hours) NOS Version No. – 1.0 NSQF Level – 5</b>	<b>36:00</b>	<b>54:00</b>			<b>90:00</b>
Module 5: Introduction to Employability Skills	1:00	2:00			3:00
Module 6: Constitutional values - Citizenship	0.5:00	1:00			1.5:00
Module 7: Becoming a Professional in the 21st Century	2:00	3:00			5:00
Module 8: Basic English Skills	4:00	6:00			10:00
Module 9: Career Development & Goal Setting	1.5:00	2.5:00			4:00
Module 10: Communication Skills	4:00	6:00			10:00

Module 11: Diversity & Inclusion	1:00	1.5:00			2.5:00
Module 12: Financial and Legal Literacy	4:00	6:00			10:00
Module 13: Essential Digital Skills	8:00	12:00			20:00
Module 14: Entrepreneurship	3:00	4:00			7:00
Module 15: Customer Service	4:00	5:00			9:00
Module 16: Getting ready for apprenticeship & Jobs	3:00	5:00			8:00
<b>ASC/Naaaa – Develop AUTOSAR Architecture NOS Version No. –1.0 NSQF Level - 6</b>	<b>41:00</b>	<b>74:00</b>	<b>120:00</b>		<b>235:00</b>
Module 3: Build AUTOSAR Architecture	41:00	74:00	120:00		235:00
<b>ASC/Nbbbb – Configure and execute AUTOSAR project NOS Version No. –1.0 NSQF Level - 6</b>	<b>30:00</b>	<b>90:00</b>	<b>120:00</b>		<b>240:00</b>
Module 4: Configure and execute AUTOSAR project	30:00	90:00	120:00		240:00
<b>Total Duration</b>	<b>132:00</b>	<b>258:00</b>	<b>240:00</b>		<b>630:00</b>

# Module Details

## Module 1: Introduction to the role of an Automotive Open System (AUTOSAR) Engineer

### Bridge module

#### Terminal Outcomes:

- Discuss the role and responsibilities of an Automotive Open System (AUTOSAR) Engineer.

<b>Duration:</b> <05:00>	<b>Duration:</b> <00:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• List the role and responsibilities of an Automotive Open System (AUTOSAR) Engineer.</li> <li>• Discuss the job opportunities for an Automotive Open System (AUTOSAR) Engineer in the automobile industry.</li> <li>• Explain about Indian automobile manufacturing market.</li> <li>• List various automobile Original Equipment Manufacturers (OEMs) and different products/ models manufactured by them.</li> <li>• Discuss AUTOSAR standards followed in the industry.</li> </ul>	
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 2: Manage work and resources according to safety and conservation standards

### Mapped to ASC/N9810, v1.0

#### Terminal Outcomes:

- Employ appropriate ways to maintain safe and secure working environment
- Apply material and energy conservation practices at the workplace.

Duration: <20:00>	Duration: <40:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>• Discuss organisational procedures for health, safety and security and individual role and responsibilities related to the same.</li> <li>• List the potential workplace related risks, threats and hazards, their causes and preventions.</li> <li>• List personal protective equipment like safety gloves, glasses, shoes and mask used at the workplace.</li> <li>• List various types of fire extinguisher.</li> <li>• Identify various safety boards/ signs placed on the shop floor.</li> <li>• Explain 5S standards, procedures and policies followed at workplace.</li> <li>• Discuss organisational procedures to deal with emergencies and accidents at the workplace and importance of following them.</li> <li>• State the importance of conducting safety drills or training sessions.</li> <li>• Explain the process of filling daily check sheet for reporting to the concerned authorities about improvements done and risks identified.</li> <li>• Discuss how and when to report about potential hazards identified in the workplace and limits of responsibility for dealing with them.</li> <li>• Outline the importance of keeping workplace, equipment, restrooms etc. clean and sanitised.</li> <li>• Explain the importance of following hygiene and sanitation regulations developed by organisation at the workplace.</li> <li>• Discuss the importance of maintaining the availability of running water, hand wash and alcohol-based sanitizers at the</li> </ul>	<ul style="list-style-type: none"> <li>• Apply appropriate ways to implement safety practices to ensure safety of people at the workplace.</li> <li>• Display the correct way of wearing and disposing PPE.</li> <li>• Demonstrate the use of fire extinguisher.</li> <li>• Demonstrate how to provide first aid procedure in case of emergencies.</li> <li>• Demonstrate how to evacuate the workplace in case of an emergency.</li> <li>• Employ various techniques for checking malfunctions in the machines with the support of maintenance team and as per Standard Operating Procedures (SOP).</li> <li>• Demonstrate to arrange tools/ equipment/ fasteners/ spare parts into proper trays, cabinets, lockers as mentioned in the 5S guidelines/work instructions.</li> <li>• Apply appropriate ways to organise safety drills or training sessions for others on the identified risks and safety practices.</li> <li>• Prepare a report about the health, safety and security breaches.</li> <li>• Apply appropriate ways to check that workplace, equipment, restrooms etc. are cleaned and sanitised.</li> <li>• Role play a situation to brief the team about the hygiene and sanitation regulations developed by organisation.</li> <li>• Demonstrate the correct way of washing hands using soap and water and alcohol-based hand rubs.</li> <li>• Apply appropriate methods to support the employees to cope with stress, anxiety etc.</li> <li>• Demonstrate proper waste collection and disposal mechanism depending upon types of waste.</li> </ul>



<p>workplace.</p> <ul style="list-style-type: none"> <li>• Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol based hand sanitizers or soap.</li> <li>• Recall ways of reporting advanced hygiene and sanitation issues to the concerned authorities.</li> <li>• Elucidate various stress and anxiety management techniques.</li> <li>• Discuss the significance of greening.</li> <li>• Classify different categories of waste for the purpose of segregation.</li> <li>• Differentiate between recyclable and non-recyclable waste.</li> <li>• Discuss various methods of waste collection and disposal.</li> <li>• List the various materials used at the workplace.</li> <li>• Explain organisational recommended norms for storage of tools, equipment and material.</li> <li>• Discuss the importance of efficient utilisation of material and water.</li> <li>• Explain basics of electricity and prevalent energy efficient devices.</li> <li>• Explain the processes to optimize usage of material and energy/electricity.</li> <li>• Enlist common practices for conserving electricity at workplace.</li> </ul>	<ul style="list-style-type: none"> <li>• Perform the steps involved in storage of tools, equipment and material after completion of work.</li> <li>• Employ appropriate ways to resolve malfunctioning (fumes/ sparks/ emission/ vibration/ noise) and lapse in maintenance of equipment as per requirements.</li> <li>• Perform the steps to prepare a sample material and energy audit reports.</li> <li>• Employ practices for efficient utilization of material and energy/electricity.</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	
<ul style="list-style-type: none"> <li>• Housekeeping material: Cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel, fire extinguisher</li> <li>• Safety gears: Safety shoes, ear plug, goggles, gloves, helmet, first-aid kit</li> </ul>	

## Module 5: Introduction to Employability Skills

### Mapped to DGT/VSQ/N0103

#### Terminal Outcomes:

- Discuss about Employability Skills in meeting the job requirements

<b>Duration:</b> <1:00>	<b>Duration:</b> <2:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Outline the importance of Employability Skills for the current job market and future of work</li> </ul>	<ul style="list-style-type: none"> <li>• List different learning and employability related GOI and private portals and their usage</li> <li>• Research and prepare a note on different industries, trends, required skills and the available opportunities</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 6: Constitutional values - Citizenship

### Mapped to DGT/VSQ/N0103

#### Terminal Outcomes:

- Discuss about constitutional values to be followed to become a responsible citizen

<b>Duration:</b> <0.5:00>	<b>Duration:</b> <1:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen.</li> </ul>	<ul style="list-style-type: none"> <li>• Practice different environmentally sustainable practices</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 7: Becoming a Professional in the 21st Century

### Mapped to DGT/VSQ/N0103

#### Terminal Outcomes:

- Demonstrate professional skills required in 21<sup>st</sup> century

<b>Duration:</b> <2:00>	<b>Duration:</b> <3:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Discuss 21st century skills required for employment</li> </ul>	<ul style="list-style-type: none"> <li>• Highlight the importance of practicing 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life</li> <li>• Create a pathway for adopting a continuous learning mindset for personal and professional development</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 8: Basic English Skills

### Mapped to DGT/VSQ/N0103

#### Terminal Outcomes:

- Practice basic English speaking.

<b>Duration:</b> <4:00>	<b>Duration:</b> <6:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe basic communication skills</li> <li>• Discuss ways to read and interpret text written in basic English</li> </ul>	<ul style="list-style-type: none"> <li>• Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone</li> <li>• Read and understand text written in basic English</li> <li>• Write a short note/paragraph / letter/e - mail using correct basic English</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 9: Career Development & Goal Setting

### Mapped to DGT/VSQ/N0103

#### Terminal Outcomes:

- Demonstrate Career Development & Goal Setting skills.

<b>Duration:</b> <1.5:00>	<b>Duration:</b> <2.5:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Identify well-defined short- and long-term goals</li> </ul>	<ul style="list-style-type: none"> <li>• Create a career development plan</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 10: Communication Skills

### Mapped to DGT/VSQ/N0103

#### Terminal Outcomes:

- Practice basic communication skills.

<b>Duration:</b> <4:00>	<b>Duration:</b> <6:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>Explain the importance of communication etiquette including active listening for effective communication</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette</li> <li>Write a brief note/paragraph on a familiar topic</li> <li>Role play a situation on how to work collaboratively with others in a team</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 11: Diversity & Inclusion

### Mapped to DGT/VSQ/N0103

#### Terminal Outcomes:

- Describe PwD and gender sensitisation.

<b>Duration:</b> <1:00>	<b>Duration:</b> <1.5:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>Discuss the significance of reporting sexual harassment issues in time</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	



## Module 12: Financial and Legal Literacy

### Mapped to DGT/VSQ/N0103

#### Terminal Outcomes:

- Describe ways of managing expenses, income, and savings.

<b>Duration:</b> <4:00>	<b>Duration:</b> <6:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>Discuss various financial institutions, products, and services</li> <li>Explain the common components of salary such as Basic, PF, Allowances (HRA, TA, DA, etc.), tax deductions</li> <li>Discuss the legal rights, laws, and aids</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate how to conduct offline and online financial transactions, safely and securely and check passbook/statement</li> <li>Calculate income and expenditure for budgeting</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 13: Essential Digital Skills

### Mapped to DGT/VSQ/N0103

#### Terminal Outcomes:

- Demonstrate procedure of operating digital devices and associated applications safely.

<b>Duration:</b> <8:00>	<b>Duration:</b> <12:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe the role of digital technology in day-to-day life and the workplace</li> <li>• Discuss the significance of displaying responsible online behavior while using various social media platforms</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to operate digital devices and use the associated applications and features, safely and securely</li> <li>• Demonstrate how to connect devices securely to internet using different means</li> <li>• Follow the dos and don'ts of cyber security to protect against cyber crimes</li> <li>• Create an e-mail id and follow e- mail etiquette to exchange e -mails</li> <li>• Show how to create documents, spreadsheets and presentations using appropriate applications</li> <li>• Utilize virtual collaboration tools to work effectively</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 14: Entrepreneurship

### Mapped to DGT/VSQ/N0103

#### Terminal Outcomes:

- Describe opportunities as an entrepreneur.

<b>Duration:</b> <3:00>	<b>Duration:</b> <4:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>Explain the types of entrepreneurship and enterprises</li> <li>Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan</li> <li>Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement</li> </ul>	<ul style="list-style-type: none"> <li>Create a sample business plan, for the selected business opportunity</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 15: Customer Service

### Mapped to DGT/VSQ/N0103

#### Terminal Outcomes:

- Describe ways of maintaining customer.

<b>Duration:</b> <4:00>	<b>Duration:</b> <5:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>Classify different types of customers</li> <li>Discuss various tools used to collect customer feedback</li> <li>Discuss the significance of maintaining hygiene and dressing appropriately</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate how to identify customer needs and respond to them in a professional manner</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 16: Getting ready for apprenticeship & Jobs

### Mapped to DGT/VSQ/N0103

#### Terminal Outcomes:

- Describe ways of preparing for apprenticeship & Jobs appropriately.

<b>Duration:</b> <3:00>	<b>Duration:</b> <5:00>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>Discuss the significance of maintaining hygiene and dressing appropriately for an interview</li> <li>List the steps for searching and registering for apprenticeship opportunities</li> </ul>	<ul style="list-style-type: none"> <li>Draft a professional Curriculum Vitae (CV)</li> <li>Use various offline and online job search sources to find and apply for jobs</li> <li>Role play a mock interview</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 3: Build AUTOSAR Architecture

### Mapped to ASC/Naaaa, v1.0

#### Terminal Outcomes:

- Perform the steps of building an AUTOSAR architecture and its components.

Duration: <41:00>	Duration: <74:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>Describe need of AUTOSAR</li> <li>Discuss history of AUTOSAR and evolutions brought in AUTOSAR</li> <li>List objectives of AUTOSAR</li> <li>Discuss motivation for AUTOSAR development</li> <li>Describe vision behind AUTOSAR</li> <li>Describe principles of AUTOSAR</li> <li>Illustrate AUTOSAR organization structure</li> <li>Elaborate different standard description formats used in AUTOSAR</li> <li>Discuss the information obtained from technical specification document and AUTOSAR standards.</li> <li>Describe various AUTOSAR components i.e. Virtual Functional Bus, ports and interfaces, runtime environment, operating system, abstraction layer and service layer etc.</li> <li>Describe architecture with SW-C (standard description format)</li> <li>List AUTOSAR development tools, coding language, development platform, OS etc. available for project development</li> <li>Elaborate different protocols used for ECU's communication in Automobile. E.g., CAN, Flexray</li> <li>Describe AUTOSAR system constraints and ECU descriptions</li> <li>Describe atomic software component</li> <li>Describe API</li> <li>Describe various vehicle ECU's functional domains (Body Control, Security systems, Power train).</li> <li>Describe Client Server relationship and Describe Sender Receiver relationship</li> <li>Describe Communication attributes and Application attributes</li> <li>Describe functioning of various sensor and actuator components used in a vehicle.</li> <li>List non-standardized drivers available</li> <li>Illustrate ECU Layered Software</li> </ul>	<ul style="list-style-type: none"> <li>Show how to select appropriate AUTOSAR development tools, coding language, development platform, OS etc. as per the project requirements</li> <li>Show how to interpret ECU architecture and extract SW-C (standard description format) product specifications from vehicle specifications</li> <li>Demonstrate code writing for development of Virtual functional bus (VFB) as per the requirement</li> <li>Show how to build code and configure Runtime Environment (RTE) for the project</li> <li>Show how to build code and configure software, its components and their oriented design</li> <li>Show how to configure ports and interfaces, Sender- Receiver communication and Client- Server communication as per the requirement</li> <li>Apply appropriate ways to validate codes of all the components of architecture</li> <li>Apply appropriate ways to analyse and validate components communication behavior</li> <li>Show how to write code to develop and configure ECU Layered Software Architecture, Microcontroller Abstraction Layer and service layer as per the requirement</li> <li>Show how to develop complex drivers for running the system</li> </ul>

Architecture and Microcontroller Abstraction Layer and service layer	
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	
AUTOSAR tools, development platform, OS, software	

## Module 4: Configure and execute AUTOSAR project

### Mapped to ASC/Nbbbbb, v1.0

#### Terminal Outcomes:

- Perform steps to choose configure AUTOSAR components as per the requirement
- Perform steps to execute and validate AUTOSAR project

Duration: <30:00>	Duration: <90:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>• Describe AUTOSAR format for formal description via information exchange format</li> <li>• Describe Software components template, ECU resources, System constraints</li> <li>• Describe AUTOSAR system configuration tool</li> <li>• Describe System communication matrix</li> <li>• List Runnable entities</li> <li>• Discuss states of an Atomic software component in each runnable</li> <li>• List AUTOSAR services</li> <li>• Describe Preemption, Reentrancy and library functions</li> <li>• Describe ComSpec classes</li> <li>• List attributes specific to distribution of data</li> <li>• List communication attributes for server port</li> <li>• Describe interaction pattern for application of the sender receiver paradigm</li> <li>• Discuss internal behavior of runnable</li> <li>• Describe data set points of runnable entity</li> <li>• Describe invoking an operation</li> <li>• Discuss scheduling strategy</li> <li>• Define system configuration input</li> <li>• Define detailed scheduling information or the configuration data</li> <li>• Define RTE events</li> <li>• Define and configure communication attributes</li> <li>• List steps to be performed for configuration and execution of AUTOSAR project</li> <li>• Describe configuration and features of BSW configurator, RTE generator, software for BSW/ MCAL implementation, system tooling etc.</li> <li>• Discuss ways of basic handling of BSW</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare sample design steps to go from system level configuration to generation of ECU executable</li> <li>• Show how to select system configuration input and customize it as per the requirement</li> <li>• Apply appropriate ways to identify and distinguish system constraints</li> <li>• Show how to configure ECU extract of system configuration</li> <li>• Demonstrate steps to execute detailed scheduling information or the configuration data</li> <li>• Show how to configure component aspect that supports proper configuration of RTE and BSW</li> <li>• Show how to configure component aspect that describes the communication properties of software component</li> <li>• Show how to configure and execute component aspect that serves as a basis for the description of detailed resource</li> <li>• Show how to configure component aspect that provides more detailed description of the timing behavior of atomic software component</li> <li>• Demonstrate steps to execute RTE events</li> <li>• Show how to design and investigate response to events</li> <li>• Show how to configure RPort attributes, PPort attributes and connector attributes</li> <li>• Show how to design and execute time driven activation of runnables</li> <li>• Apply appropriate ways to interpret resource consumption</li> <li>• Demonstrate use appropriate BSW configurator, RTE generator, system tooling etc. to connect all the AUTOSAR architecture components</li> <li>• Demonstrate execution of AUTOSAR</li> </ul>



<p>implementation tools, MCAL implementation tools, BSW configuration tools, RTE generator tools and system tools</p> <ul style="list-style-type: none"> <li>• Describe type of licenses and their respective usage scenario</li> <li>• List different hardware used as ECU</li> <li>• Describe testing methodologies to check the AUTOSAR system functioning as per specifications</li> </ul>	<p>project as per organisational procedure</p> <ul style="list-style-type: none"> <li>• Show how to set up environment and develop use cases for simulation and testing</li> <li>• Apply appropriate ways to test the performance of the system against product specifications</li> <li>• Apply appropriate ways to review codes and UTCs to identify errors and correct them as per the requirement</li> <li>• Demonstrate organisational procedure for submitting the corrected code to the concerned person for approval</li> </ul>
<b>Classroom Aids:</b>	
Whiteboard, marker pen, projector	
<b>Tools, Equipment and Other Requirements</b>	
AUTOSAR tools, development platform, OS, software	

## Annexure

### Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
B.E/B.Tech	Mechanical/ Automobile/ Electrical / Electronics/ Computer Science/IT	4	Mechanical/ Automobile/ Electronics/ Instrumentation	1	Mechanical/ Automobile/ Electronics/ Instrumentation	NA
B.E/B.Tech	Mechanical/ Automobile/ Electrical / Electronics/ Computer Science/IT	5	Mechanical/ Automobile/ Electronics/ Instrumentation	0	Mechanical/ Automobile/ Electronics/ Instrumentation	NA
Diploma	Mechanical/ Automobile/ Electrical / Electronics/ Computer Science/IT	3	Mechanical/ Automobile/ Electronics	1	Mechanical/ Automobile/ Electronics	NA
Diploma	Mechanical/ Automobile/ Electrical / Electronics/ Computer Science/IT	4	Mechanical/ Automobile/ Electronics	0	Mechanical/ Automobile/ Electronics	NA
M.E/M.Tech	Mechanical/ Automobile/ Electrical / Electronics/ Computer Science/IT	2	Mechanical/Auto mobile/ Electrical/ Electronics	1	Mechanical/Automo bile/ Electrical/ Electronics	NA
M.E/M.Tech	Mechanical/ Automobile/ Electrical / Electronics/ Computer Science/IT	3	Mechanical/Auto mobile/ Electrical/ Electronics	0	Mechanical/Automo bile/ Electrical/ Electronics	NA

Trainer Certification	
Domain Certification	Platform Certification
“Automotive Open System (AUTOSAR) Engineer, ASC/Q8309, version 1.0”. 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 Experience		Remarks
		Years	Specialization	Years	Specialization	
B.E/B.Tech	Mechanical/ Automobile/ Electrical / Electronics/ Computer Science/IT	5	Mechanical/ Automobile/ Electronics/ Instrumentation	1	Mechanical/ Automobile/ Electronics/ Instrumentation	NA
B.E/B.Tech	Mechanical/ Automobile/ Electrical / Electronics/ Computer Science/IT	6	Mechanical/ Automobile/ Electronics/ Instrumentation	0	Mechanical/ Automobile/ Electronics/ Instrumentation	NA
Diploma	Mechanical/ Automobile/ Electrical / Electronics/ Computer Science/IT	4	Mechanical/ Automobile/ Electronics	1	Mechanical/ Automobile/ Electronics	NA
Diploma	Mechanical/ Automobile/ Electrical / Electronics/ Computer Science/IT	5	Mechanical/ Automobile/ Electronics	0	Mechanical/ Automobile/ Electronics	NA
M.E/M.Tech	Mechanical/ Automobile/ Electrical / Electronics/ Computer Science/IT	3	Mechanical/Auto mobile/ Electrical/ Electronics	1	Mechanical/Automo bile/ Electrical/ Electronics	NA
M.E/M.Tech	Mechanical/ Automobile/ Electrical / Electronics/ Computer Science/IT	4	Mechanical/Auto mobile/ Electrical/ Electronics	0	Mechanical/Automo bile/ Electrical/ Electronics	NA

Assessor Certification	
Domain Certification	Platform Certification
"Automotive Open System (AUTOSAR) Engineer, ASC/Q8309, version 1.0". 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
<b>Declarative Knowledge</b>	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.
<b>Key Learning Outcome</b>	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).
<b>OJT (M)</b>	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
<b>OJT (R)</b>	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
<b>Procedural Knowledge</b>	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.
<b>Training Outcome</b>	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
<b>Terminal Outcome</b>	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

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