



Model Curriculum

QP Name: Advanced Driver Assistance System (ADAS) Engineer

QP Code: ASC/Q8311

QP Version: ¹.0

NSQF Level: 5.5

Model Curriculum Version: 1.0

Automotive Skills Development Council |
E-113, Gr Floor, Okhla Industrial Area, Phase – III,
New Delhi – 110020

¹ | Advanced Driver Assistance System (ADAS) Engineer

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Training Parameters

Sector	Automotive
Sub-Sector	Research & Development
Occupation	Automotive Product Development
Country	India
NSQF Level	5.5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/9122.0301
Minimum Educational Qualification and Experience	3 years Diploma (Mechanical/Automobile/ Electrical / Electronics) after class 10th from recognized regulatory body with 3 years of relevant experience OR Pursuing 4th year of B.E./B.Tech in the relevant field and continuous education OR Certificate-NSQF (Electric Vehicle Product Design Engineer Level 5) with 2 Years of relevant experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	22 years
Last Reviewed On	28/02/2023
Next Review Date	28/02/2026
NSQF Approval Date	28/02/2023
QP Version	1.0
Model Curriculum Creation Date	28/02/2023
Model Curriculum Valid Up to Date	28/02/2026
Model Curriculum Version	1.0
Minimum Duration of the Course	630 Hours
Maximum Duration of the Course	630 Hours

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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 the steps for development of ADAS system.
- Perform steps for Implementation of ADAS system.
- Implement safety practices.
- Use resources optimally 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 Advanced Driver Assistance System (ADAS) Engineer	5:00	0:00			5:00
ASC/N9818: Manage work and resources (Research & Development) NOS Version No. – 1.0 NSQF Level – 5	15:00	40:00			55:00
Module 2: Manage work and resources according to safety and conservation standards	15:00	40:00			55:00
DGT/VSQ/N0103 - Employability Skills (90 hours) NOS Version No. – 1.0 NSQF Level – 6	36:00	54:00			90:00
Module 3: Introduction to Employability Skills	1:00	2:00			3:00
Module 4: Constitutional values - Citizenship	0.5:00	1:00			1.5:00
Module 5: Becoming a Professional in the 21st Century	2:00	3:00			5:00

Module 6: Basic English Skills	4:00	6:00			10:00
Module 7: Career Development & Goal Setting	1.5:00	2.5:00			4:00
Module 8: Communication Skills	4:00	6:00			10:00
Module 9: Diversity & Inclusion	1:00	1.5:00			2.5:00
Module 10: Financial and Legal Literacy	4:00	6:00			10:00

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Module 11: Essential Digital Skills	8:00	12:00			20:00
Module 12: Entrepreneurship	3:00	4:00			7:00
Module 13: Customer Service	4:00	5:00			9:00
Module 14: Getting ready for apprenticeship & Jobs	3:00	5:00			8:00
ASC/N8339 – Development of ADAS system NOS Version No. –1.0 NSQF Level – 5.5	70:00	70:00	70:00		210:00
Module 15: Prepare for building an ADAS system	30:00	30:00	30:00		90:00
Module 16: Build an ADAS system	40:00	40:00	40:00		120:00
ASC/N8340 – Implementation of ADAS system NOS Version No. –1.0 NSQF Level – 5.5	90:00	94:00	86:00		270:00
Module 17: Prepare for implementing and testing of ADAS system	20:00	30:00	16:00		66:00
Module 18: Perform implementation and testing of ADAS system	35:00	32:00	35:00		102:00
Module 19: Perform validation and execution of ADAS system	35:00	32:00	35:00		102:00
Total Duration	216:00	258:00	156:00		630:00

Module Details

Module 1: Introduction to the role of an Advanced Driver Assistance System (ADAS) Engineer

Bridge module

Terminal Outcomes:

- Discuss the role and responsibilities of an Advanced Driver Assistance System (ADAS) Engineer.

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

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

Mapped to ASC/N9818, v1.0

Terminal Outcomes:

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

Duration: <15:00>	Duration: <40:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss organisational procedures for health, safety and security and individual role and responsibilities related to the same. • List the potential workplace related risks, threats and hazards, their causes and preventions. • List personal protective equipment like safety gloves, glasses, shoes and mask used at the workplace. • List various types of fire extinguisher. • Identify various safety boards/ signs placed on the shop floor. • Explain 5S standards, procedures and policies followed at workplace. • Discuss organisational procedures to deal with emergencies and accidents at the workplace and importance of following them. • State the importance of conducting safety drills or training sessions. • Explain the process of filling daily check sheet for reporting to the concerned authorities about improvements done and risks identified. • Discuss how and when to report about potential hazards identified in the workplace and limits of responsibility for dealing with them. • Outline the importance of keeping workplace, equipment, restrooms etc. clean and sanitised. • Explain the importance of following hygiene and sanitation regulations developed by organisation at the workplace. • Discuss the importance of maintaining the availability of running water, hand wash and alcohol-based sanitizers at the 	<ul style="list-style-type: none"> • Apply appropriate ways to implement safety practices to ensure safety of people at the workplace. • Display the correct way of wearing and disposing PPE. • Demonstrate the use of fire extinguisher. • Demonstrate how to provide first aid procedure in case of emergencies. • Demonstrate how to evacuate the workplace in case of an emergency. • Employ various techniques for checking malfunctions in the machines with the support of maintenance team and as per Standard Operating Procedures (SOP). • Demonstrate to arrange tools/ equipment/ fasteners/ spare parts into proper trays, cabinets, lockers as mentioned in the 5S guidelines/work instructions. • Apply appropriate ways to organise safety drills or training sessions for others on the identified risks and safety practices. • Prepare a report about the health, safety and security breaches. • Apply appropriate ways to check that workplace, equipment, restrooms etc. are cleaned and sanitised. • Role play a situation to brief the team about the hygiene and sanitation regulations developed by organisation. • Demonstrate the correct way of washing hands using soap and water and alcoholbased hand rubs. • Apply appropriate methods to support the employees to cope with stress, anxiety etc. • Demonstrate proper waste collection and disposal mechanism depending upon types of waste.

<p>workplace.</p> <ul style="list-style-type: none"> • Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol based hand sanitizers or soap. • Recall ways of reporting advanced hygiene and sanitation issues to the concerned authorities. • Elucidate various stress and anxiety management techniques. • Discuss the significance of greening. • Classify different categories of waste for the purpose of segregation. • Differentiate between recyclable and nonrecyclable waste. • Discuss various methods of waste collection and disposal. • List the various materials used at the workplace. • Explain organisational recommended norms for storage of tools, equipment and material. • Discuss the importance of efficient utilisation of material and water. • Explain basics of electricity and prevalent energy efficient devices. • Explain the processes to optimize usage of material and energy/electricity. • Enlist common practices for conserving electricity at workplace. 	<ul style="list-style-type: none"> • Perform the steps involved in storage of tools, equipment and material after completion of work. • Employ appropriate ways to resolve malfunctioning (fumes/ sparks/ emission/ vibration/ noise) and lapse in maintenance of equipment as per requirements. • Perform the steps to prepare a sample material and energy audit reports. • Employ practices for efficient utilization of material and energy/electricity.
<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 Introduction to Employability Skills

Mapped to DGT/VSQ/N0103

Terminal Outcomes:

- Discuss about Employability Skills in meeting the job requirements

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

Module 4 Constitutional values - Citizenship

Mapped to DGT/VSQ/N0103

Terminal Outcomes:

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

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

Module 5 Becoming a Professional in the 21st Century

Mapped to DGT/VSQ/N0103

Terminal Outcomes:

- Demonstrate professional skills required in 21st century

Duration: <2:00>	Duration: <3:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss 21st century skills required for employment 	<ul style="list-style-type: none"> • 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 • Create a pathway for adopting a continuous learning mindset for personal and professional development
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 6 Basic English Skills

Mapped to DGT/VSQ/N0103

Terminal Outcomes:

- Practice basic English speaking.

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

Module 7 Career Development & Goal Setting

Mapped to DGT/VSQ/N0103

Terminal Outcomes:

- Demonstrate Career Development & Goal Setting skills.

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

Module 8 Communication Skills

Mapped to DGT/VSQ/N0103

Terminal Outcomes:

- Practice basic communication skills.

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

Module 9 Diversity & Inclusion

Mapped to DGT/VSQ/N0103

Terminal Outcomes:

- Describe PwD and gender sensitisation.

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

Module 10 Financial and Legal Literacy

Mapped to DGT/VSQ/N0103

Terminal Outcomes:

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

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

Module 11 Essential Digital Skills

Mapped to DGT/VSQ/N0103

Terminal Outcomes:

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

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

Module 12 Entrepreneurship

Mapped to DGT/VSQ/N0103

Terminal Outcomes:

- Describe opportunities as an entrepreneur.

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

Module 13 Customer Service

Mapped to DGT/VSQ/N0103

Terminal Outcomes:

- Describe ways of maintaining customer.

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

Module 14 Getting ready for apprenticeship & Jobs

Mapped to DGT/VSQ/N0103

Terminal Outcomes:

- Describe ways of preparing for apprenticeship & jobs appropriately.

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

Module 15 Prepare for building an ADAS system

Mapped to ASC/N8339, v1.0

Terminal Outcomes:

- Perform preparatory activities for building an ADAS system.

Duration: <30:00>	Duration: <30:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe need of ADAS system • Describe objectives, principles and vision behind ADAS system • Discuss different standard description formats used in ADAS system • Describe different protocols used in Automobile E.g., CAN, Flexray • Describe ADAS system components i.e. specialized camera, radar system, sensors etc. • Discuss the information obtain from design document and inputs from the OEM/customer for building an ADAS system. • List various sensor and actuator components. • List various ADAS design standards and protocols. • List development tools, programming language (i.e. java, python), development platform, driver interface, telematics system, controllers, sensors and actuators etc. as required for ADAS system development. • Describe ‘pre-test’ conditioning. • List documentation for test set-up and validation. 	<ul style="list-style-type: none"> • Show how to interpret design document, ADAS design standards and protocols to identify system requirements and testing parameters which need to be measured during the testing procedure • Show how to identify and select appropriate development tools, programming language (i.e. java, python), development platform, driver interface, telematics system, controllers, sensors and actuators etc. as per the project requirements. • Show how to prepare plan and costing for developing the ADAS system as per the requirements. • Demonstrate procedure of installing the sensors, actuators etc. in a dummy vehicle for data collection purpose. • Show how to set-up function-based obstructions on test track. • Demonstrate procedure of testing vehicle ‘pre-test’ conditioning. • Show how to conduct the test drives of the vehicle and collate the data of sensors, actuators etc. on required testing parameters for the analysis purpose. • Show how to drive and simulate all the functions of ADAS and failure points.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
PCs/Laptops, Internet with Wi-Fi (Min2 Mbps Dedicated) 18 documents of PPAP, Design records, Design Records, Authorized Engineering Change Documents, ADAS	

Module 16 Build an ADAS system

Mapped to ASC/N8339, v1.0

Terminal Outcomes:

- Perform steps for building an ADAS system.

Duration: <40:00>	Duration: <40:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List ADAS system development tools • Describe process of source code component implementation • List various sensor and actuator components • List various ADAS system protocols and standards • Describe DFMEA- Design Failure Mode and Effect Analysis • Describe Functional Safety Standard- ISO26262 	<ul style="list-style-type: none"> • Show how to prepare the data, which may include trimming, decoding, data enrichment (labeling or ground truth generation), processing and adding metadata such as weather and traffic conditions. • Apply appropriate ways to analyse the results of testing. • Show how to prepare process design to implement required ADAS standards and protocols in the ADAS system. • Show how to develop and build algorithms for ADAS system operation as per the requirement. • Show how to build code and configure software of micro-controllers, its components and their oriented design using embedded C, C++ and MATLAB. • Apply appropriate ways to write clean and scalable codes. • Perform data automation for data outputs by using python, R, java, etc. • Show how to create data visualizations by using Power BI, Python. • Apply appropriate ways to validate codes of all the components of architecture to ensure required output. • Apply appropriate ways to analyse and validate behavior of the system • Show how to prepare a learning and development plan considering safety standards and protocol
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

PCs/Laptops, Internet with Wi-Fi (Min2 Mbps Dedicated)
18 documents of PPAP, Design records, Design Records, Authorized Engineering Change Documents, ADAS

Module 17 Prepare for implementing and testing of ADAS system

Mapped to ASC/N8340, v1.0

Terminal Outcomes:

- Perform preparatory steps for implementation and testing of ADAS system.

Duration: <20:00>	Duration: <30:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe Vector tools (CANoe, CANape, HIL Set-up) • List IBM ALM tools- Requirement, Change, version control and test management tools • Describe ISO26262 L1 and L2 certification • Describe QA methodologies- DFMEA and PFMEA • List Simulation tools- MATLABS, SIMULINK, Enterprise Architect • Describe ECU development ‘V’ cycle from concept to production 	<ul style="list-style-type: none"> • Demonstrate design steps to go from ADAS system level configuration. • Show how to select system configuration input and customize it as per the requirement. • Show how to integrate all sensors, actuators, controllers and allied systems with the vehicle. • Build test suites with various test use cases, as well as required closed-loop simulation and open-loop re-simulation (replay) validation jobs to verify ADAS models. • Prepare a sample plan to use proper testing methodologies to check the system functioning as per specifications.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
Diagnostic tools, testing tools, simulation tools, software testing tools, hand tools, measuring tools, measuring instruments, gauges	

Module 18 Perform implementation and testing of ADAS system

Mapped to ASC/N8340, v1.0

Terminal Outcomes:

- Perform steps for implementation and testing of ADAS system.

Duration: <35:00>	Duration: <32:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe automotive communication and diagnostic protocols- CAN, LIN, FLEXRAY, ETHERNET, UDS • Discuss domestic and international regulatory and certifications like CMVR, AIS, ECE, ISO, MISRA, NCAP, Cybersecurity • Describe RADAR, LIDAR, Camera data processing • Describe Data Analytics and Visualisation • Describe quality assurance matrix • Describe various testing for ADAS system • Describe ADAS features in SiL, HiL, LABCAR and Vehicle 	<ul style="list-style-type: none"> • Demonstrate steps of severity wise assessment of vehicle for safety worthiness relevant to ADAS verification as prescribed in NHTSA • Show how to develop and execute functional test procedures • Demonstrate steps of testing the performance of the system against product specifications and regulatory requirements • Demonstrate steps of product reliability and validation testing • Demonstrate steps of unit testing frameworks • Demonstrate steps of tracking of quality assurance matrix • Show how to manage multiple release streams within source code management tool • Demonstrate steps of system testing of ADAS features in SiL, HiL, LABCAR and Vehicle • Demonstrate steps of unit testing, functional and integration testing and system testing
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
Diagnostic tools, testing tools, simulation tools, software testing tools, hand tools, measuring tools, measuring instruments, gauges	

Module 19 Perform validation and execution of ADAS system

Mapped to ASC/N8340, v1.0

Terminal Outcomes:

- Perform steps for validation and execution of ADAS system.

Duration: <35:00>	Duration: <32:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe ENCAP, EUROENCAP Certification • Describe ARAI, ICAT testing and Approval 	<ul style="list-style-type: none"> • Show how to review codes and UTCs to identify errors, if any • Apply appropriate ways to check inputs to identify design corrections • Apply appropriate ways to correct the code and submit the corrected code to the concerned person for approval • Apply appropriate ways to develop and integrate ADAS system with third party software
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
Diagnostic tools, testing tools, simulation tools, software testing tools, hand tools, measuring tools, measuring instruments, gauges	

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	4	Mechanical/ Automobile/ Electronics/ Instrumentation	1	Mechanical/ Automobile/ Electronics/ Instrumentation	NA
B.E/B.Tech	Mechanical/Automobile/ Electrical/ Electronics	5	Mechanical/ Automobile/ Electronics/ Instrumentation	0	Mechanical/ Automobile/ Electronics/ Instrumentation	NA
Diploma	Mechanical/Automobile/ Electrical/ Electronics	3	Mechanical/ Automobile/ Electronics	1	Mechanical/ Automobile/ Electronics	NA
Diploma	Mechanical/Automobile/ Electrical/ Electronics	4	Mechanical/ Automobile/ Electronics	0	Mechanical/ Automobile/ Electronics	NA
M.E/M.Tech	Mechanical/Automobile/ Electrical/ Electronics	2	Mechanical/Automobile/ Electrical/ Electronics	1	Mechanical/Automobile/ Electrical/ Electronics	NA
M.E/M.Tech	Mechanical/Automobile/ Electrical/ Electronics	3	Mechanical/Automobile/ Electrical/ Electronics	0	Mechanical/Automobile/ Electrical/ Electronics	NA

Trainer Certification	
Domain Certification	Platform Certification
“Advanced Driver Assistance System (ADAS) Engineer, ASC/Q8311, version 1.0”. Minimum accepted score is 80%.	Trainer is certified for the job role “Trainer” (VET and Skills); mapped to QP: “MEP/Q2601, V2.0” with minimum score of 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	5	Mechanical/ Automobile/ Electronics/ Instrumentation	1	Mechanical/ Automobile/ Electronics/ Instrumentation	NA
B.E/B.Tech	Mechanical/Automobile/ Electrical/ Electronics	6	Mechanical/ Automobile/ Electronics/ Instrumentation	0	Mechanical/ Automobile/ Electronics/ Instrumentation	NA
Diploma	Mechanical/Automobile/ Electrical/ Electronics	4	Mechanical/ Automobile/ Electronics	1	Mechanical/ Automobile/ Electronics	NA
Diploma	Mechanical/Automobile/ Electrical/ Electronics	5	Mechanical/ Automobile/ Electronics	0	Mechanical/ Automobile/ Electronics	NA
M.E/M.Tech	Mechanical/Automobile/ Electrical/ Electronics	3	Mechanical/Automobile/ Electrical/ Electronics	1	Mechanical/Automobile/ Electrical/ Electronics	NA
M.E/M.Tech	Mechanical/Automobile/ Electrical/ Electronics	4	Mechanical/Automobile/ Electrical/ Electronics	0	Mechanical/Automobile/ Electrical/ Electronics	NA

Assessor Certification	
Domain Certification	Platform Certification
“Advanced Driver Assistance System (ADAS) Engineer, ASC/Q8311, version 1.0”. Minimum accepted score is 80%.	Assessor is certified for the job role “Assessor” (VET and Skills); mapped to QP: “MEP/Q2701, V2.0” with minimum score of 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