

Model Curriculum

Computer Aided Test Executive

SECTOR: AUTOMOTIVE
SUB-SECTOR: R & D
OCCUPATION: Testing
REF ID: ASC/Q5102, v1.0
NSQF LEVEL: 6


Skill India
शिक्षण महारा - गुणवत्ता महारा


AUTOMOTIVE SKILLS DEVELOPMENT COUNCIL


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**CURRICULUM COMPLIANCE TO
QUALIFICATION PACK - NATIONAL OCCUPATIONAL
STANDARDS**

is hereby issued by the

AUTOMOTIVE SKILLS DEVELOPMENT COUNCIL

for

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/Qualification Pack "**Computer Aided Test Executive**" QP No: "**ASC/Q5102 Level 6**"

Date of Issuance: October 24th, 2018

Valid up to: October 23rd, 2020*

*Valid up to the next review date of the Qualification Pack


Authorised Signatory
(Automotive Skills Development Council)

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Computer Aided Test Executive

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Computer Aided Test Executive”, in the “Automotive” Sector/Industry and aims at building the following key competencies amongst the learner.

Program Name	Computer Aided Test Executive		
Qualification Pack Name and Reference ID.	ASC/Q5102, v1.0		
Version No.	1.0	Version Update Date	19-11-2018
Pre-requisites to Training	B.E/ B. Tech. (Mechanical /Automobile/ Electrical & Electronics/ Instrumentation)		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Check and validate vehicle before manufacturing actual prototype for conducting an road test • Check and validate aggregate design before manufacturing actual prototype for physical testing • Use various software based Computer Aided Engineering (CAE) to test aggregates and vehicles • Describe the test requirements and the process of establishing parameters of simulation • Conduct CAE tests for assessing vehicle performance and durability • Document test result as per standard operating procedures • Analyse the test results and prepare first level assessment report and creating an analysis report • Discuss modifications to the prototype / design based on the analysis with other disciplines within and outside Research and Development (R & D) with senior colleagues/ experts • Identify and report risks for Health, Safety and Environment (HSE). • Ensure 5S environment across the plant and office premises of the organization as given in the organization guidelines. 		

Sr. No.	Module	Key Learning Outcomes	Equipment Required
4	<p>Ensure documentation and analysis of the various tests conducted Theory Duration (hh:mm) 60:00</p> <p>Practical Duration (hh:mm) 70:00</p> <p>Corresponding NOS Code ASC/N5105</p>	<ul style="list-style-type: none"> Describe Product Lifecycle Management (PLM) Practice on designing and simulation software of various manufacturers such as SIEMENS, Dassault or other related software used for designing and simulations Identify various PLM software/s used by various vehicle manufacturers Demonstrate operation of software documentation systems Perform documentation and integration of basic system with PLM systems and development systems Demonstrate storage and filing systems for models Evaluate test results in the vehicle and development documentation hierarchy. Practice on usage of PLM software/s with application of entire designing of an automobile 	<ul style="list-style-type: none"> Workstation with PLM Software of SIMENS, DASSAULT ENOVIA and other any other PLM software company Help manuals, PLM or ERP cross references
5	<p>Maintain a safe and healthy working environment at the work place Theory Duration (hh:mm) 40:00</p> <p>Practical Duration (hh:mm) 20:00</p> <p>Corresponding NOS Code ASC/N0006</p>	<ul style="list-style-type: none"> List workplace hazards and risks Use personal protective equipment like safety gloves, safety glasses, safety shoes and safety helmet at workplace. Identify activities which can cause potential injury Explain the concerned authorities about machine breakdowns, damages Assist the safety team and the supervisor in creating the risk mitigation plan Follow the safety, health and environment related practices Ensure relevant safety board's/ signs are placed on the shop floor Demonstrate use of fire-fighting equipment Perform first-aid practices. Maintain a clean and safe working environment Attend all safety and fire drills to be self-aware of safety hazards and preventive techniques Maintain high standards of personal hygiene at the work place 	<ul style="list-style-type: none"> Training Chart, Case study- Audio/ Video
6	<p>Ensure implementation of 5S activities at the shop floor and the office area</p> <p>Theory Duration (hh:mm) 30:00</p> <p>Practical Duration (hh:mm) 25:00</p> <p>Corresponding NOS Code</p>	<ul style="list-style-type: none"> Identify that the work area, tools, equipment and materials are clean Demonstrate storage of cleaning material and equipment in the correct location and in good condition Follow good grooming practices Follow the daily cleaning standards and schedules to create a clean working environment Execute sorting of materials, tools and equipment's and spare parts Follow proper labelling procedures Follow proper storage procedures Do segregation of waste into Hazardous and Non-Hazardous waste and dispose the waste as per SOP 	<ul style="list-style-type: none"> Case study material

	ASC/N0022	<ul style="list-style-type: none"> Follow 5S guidelines at workplace 	
	<p>Total Duration</p> <p>Theory Duration 250:00</p> <p>Practical Duration 250:00</p>	<p>Unique Equipment Required: Laptop, white board, marker, projector, CAE /Analysis software such as Nastran, Simi link, Mat lab or similar tool to handle problems related to structural, fluid, thermodynamic , vehicle dynamic performance.</p>	

Grand Total Course Duration: **500Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by AutomotiveSkills Development Council)

Trainer Prerequisites for Job role: “Computer Aided Test Executive” mapped to Qualification Pack: “ASC/Q5102 v1.0”

Sr. No.	Area	Details
1	Description	A Computer Aided Test Executive– Trainer provides training and orientation to the candidates to enable them to be responsible to understand application and operation of Computer Aided Test Executive tools for testing vehicle products at design stage of APQP and be an interface with members of Development and R & D team.
2	Personal Attributes	A Computer Aided Trainer should have a mind for computer tools, data management. Dexterity, good eye-sight, Mind-eye-hand co-ordination are essential attributes. Ability to understand trainees’ strong and weak areas is preferred.
3	Minimum Educational Qualifications	B.Tech. (Mechanical /Automobile/ Electrical & Electronics/ Instrumentation) and M. Tech (Mechanical /Automobile/ Electrical & Electronics/ Instrumentation)
4a	Domain Certification	Certified for Job Role: “Computer Aided Test Executive”, mapped to QP: “ASC/Q5102, Version 1.0”. Minimum accepted qualifying score-80% as per ASDC Guidelines.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/ Q0102”. Minimum accepted score as per MEPSC guidelines is 80%.
5	Experience	B.Tech. with 8 years and M.Tech with 5 years of Industry experience in working in R & D Design/ Development/testing and or Computer Aided Test Executive

Annexure: Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role: Computer Aided Test Executive

Qualification Pack: ASC/Q5102, v1.0

Sector Skill Council: Automotive Skills Development Council

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on these criteria.
5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS.
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessable outcomes	Assessment Criteria	Total Marks	Out of	Theory	Practical Skills
ASC /N5104 Conduct testing of vehicles and aggregates using Computer Aided Engineering Aids	PC1. Understand the type of vehicle under test along with detailed understanding of the vehicle specifications		3	2	1
	PC2. Understand the various organizational, domestic and international regulations impacting the performance of the vehicle under test		2	1	1
	PC3. Understand the type of tests to be performed in the computer simulated environment by using the test checklist provided by the cross functional team		4	2	2
	PC4. Understand various types of software modules like Pro Mechanics, Nast ran, Mat lab, Simi link etc. and their utility to conduct various CAE based component and vehicle tests		3	1	2
	PC5. Understand the testing methodology, process and test parameters required as per the Work Instructions/Standard Operating Procedures. Establish various data parameters for test results to enable comparison / simulation of performance.		4	2	2
	PC6. Ensure selection of specified software program for testing the given component/ vehicle		3	1	2
	PC7. Ensure selection of correct testing and simulation parameters as per the testing instruction manual provided by the team		4	2	2

PC8.	Conduct the structural analysis of the test prototype and measure fatigue strength, body structure strength, chassis strength, vehicle door and window framework strength and metal fatigue analysis by selecting the correct testing parameters in the structural analysis program	6	2	4
PC9.	Calculate the bending stiffness and torsional stiffness values for the vehicle components under testing	7	2	5
PC10.	Conduct CAE enabled motion tests for checking complex mechanical systems as engine, gearbox, power train and note down observations	4	1	3
PC11.	Conduct CAE simulated time motion based vehicle crash tests as per the testing instructions mentioned in the testing manual and note observations	6	2	4
PC12.	Conduct front, side and rear crash impact testing and note observations of crash impact on vehicle structure and vehicle inhabitants (through biomechanics and CAE dummies)	3	1	2
PC13.	Plot graphs for Force Vs. deformation and Time Vs. deformation and conduct first level analysis of impact	3	1	2
PC14.	Using the recommended software programs, conduct the metal fatigue and stress strain analysis on vehicles and components	3	1	2
PC15.	Conduct the CAE simulated drop test to understand stress and shock bearing strength of the vehicle and the components	3	1	2
PC16.	Conduct CFD (Computational Fluid Dynamics) to test the flow of fuel, lubricants, oil and water in the vehicle piping system	6	2	4
PC17.	Ensure testing of thermal flow including exhaust gases through the thermal flow analysis module	3	1	2
PC18.	Conduct non-linear analysis of rubber, plastic and metallic components to understand denting impact, cross movement, compression and expansion of components	3	1	2
PC19.	Using CAE enabled modules, test the outer body of vehicles to understand the vibration behaviour of vehicle body and frames	4	2	2
PC20.	Using digital electrical and electronic simulation program, test the working and performance of the vehicle electrical, electronics, telemetric, instrumentation and navigation systems to ensure error free communication and decision making	3	1	2
PC21.	Carry transfer path analysis, acoustic testing and component frequency analysis using relevant NVH testing modules	4	2	2
PC22.	Conduct ergonomics testing using CAE enabled modules to test vehicle design, rider comfort, seating comfort, braking process, steering movement process and overall vehicle dimensions	3	1	2

ASC/N0022 Ensure implementation of 5S activities at the shop floor & the office area	PC1. Ensure all recyclable materials are put in designated containers	3	1	2
	PC2. Ensure no Tools, fixtures & jigs are lying on workstations unless in use and no unnecessary items is lying on workbenches or work surfaces unless in use	4	2	2
	PC3. Ensure that the operators and other team members are segregating the waste in hazardous/ Non Hazardous waste as per the sorting work instructions	4	2	2
	PC4. Ensure that all the operators are following the technique of waste disposal and waste storage in the designated bins	4	1	3
	PC5. Segregate the items which are labelled at red tag items for the process area and keep them in the correct places	2	1	1
	PC6. Ensure that all the tools/ equipment/ fasteners/ spare parts are arranged as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions	3	1	2
	PC7. Check for return of any type of extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area	3	1	2
	PC8. Oversee removal of unnecessary equipment, storage, furniture, unneeded inventory, supplies, parts and material	3.5	0.5	3
	PC9. Ensure that areas of material storage areas are not overflowing	4	1	3
	PC10. Ensure proper stacking and storage of the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required	4	1	3
	PC11. Ensure that the team follows the given instructions and checks for labelling of fluids, oils. Lubricants, solvents, chemicals etc. and proper storage of the same to avoid spillage, leakage, fire etc.	5	1	4
	PC12. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions	5	1	4
	PC13. Ensure that organizing the workplace takes place with due considerations to the principles of wasted motions, ergonomics, work & method study.	4	1	3
	PC14. Ensure that the area has floors swept, machinery clean and is generally neat and tidy. In case of cleaning, ensure that correct displays are maintained on the floor which indicate potential safety hazards	2.5	0.5	2
	PC15. Ensure workbenches and work surfaces are clean and in good condition	3.5	0.5	3
	PC16. Ensure adherence to the cleaning schedule for the lighting system to ensure proper illumination	3.5	0.5	3

PC17. Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene	2.5	0.5	2
PC18. Ensure that daily cleaning standards and schedules to create a clean working environment are followed across the plant	1.5	0.5	1
PC19. Oversee that various cleaning and organizing tasks have been developed and assigned for the work area	3	1	2
PC20. Ensure logical and user friendly documentation and file management for all activities across the plant and create guidelines around standardization of processes	2.5	0.5	2
PC21. Ensure timely creation and sharing of the 5S checklists	2.5	0.5	2
PC22. Ensure that the 5S manual are available as per the timelines	3	1	2
PC23. Ensure team cooperation during the audit of 5S activities	3	1	2
PC24. Ensure that workmen are periodically trained to address challenges related to 5S	3.5	0.5	3
PC25. Participate actively in employee work groups on 5S and encourage team members for active participation	3.5	0.5	3
PC26. Oversee that the staff/operators are trained and fully understand 5s procedures	4	1	3
PC27. Ensure that all the guidelines for What to do and What not to do to build sustainability in 5S are mentioned in the 5S check lists/ work instructions and are easily searchable	4.5	0.5	4
PC28. Ensure continuous training of the team members on 5S in order to increase their awareness and support implementation	3.5	0.5	3
PC29. Ensure that all visual controls, notice boards, symbols etc. at the manufacturing place are created, working and are put up as per the requirement	5	1	4
Subtotal	100	100	25
Grand Total	400	400	130