सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

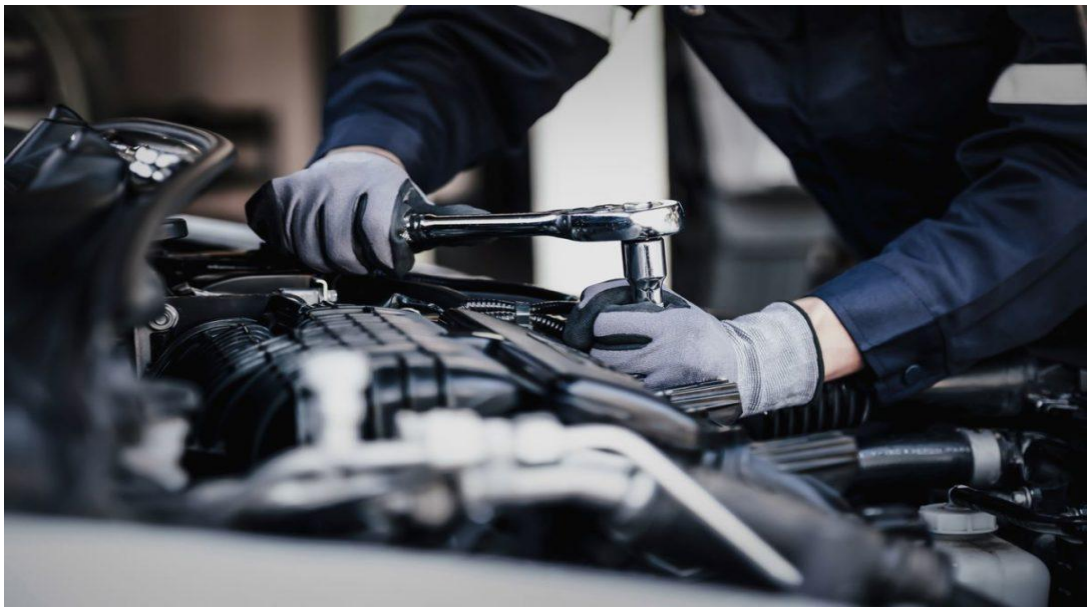
AUTOMOTIVE QUALITY INSPECTION TECHNICIAN

(Duration: Two Years)

CRAFTSMEN TRAINING SCHEME (CTS)

(Flexi-MoU)

NSQFLEVEL- 4



SECTOR – AUTOMOTIVE

कौशलं बलम्
Directorate General of Training

AUTOMOTIVE QUALITY INSPECTION TECHNICIAN

(Designed in 2024)

Version: 1.0

CRAFTSMEN TRAINING SCHEME (CTS)

Under Flexi-MoU

NSQF LEVEL- 4

Developed By

Toyota Kirloskar Motor Pvt. Ltd.

&

Government of India

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

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1. COURSE INFORMATION

Flexi- MoU is one of the pioneer program under DGT on the basis of the MoU in between DGT & Industry Training Partner (ITP) for propagating vocational training to allow industries to take advantage of various schemes for conducting training program in higher employment potential courses according to needs of industries. The concept of Flexi- MoU was introduced in June-July 2014. DGT and Industry Training Partner (ITP) shall decide to sign the memorandum of understanding to provide an opportunity to the youth to acquire skills related to Automobile and Manufacturing industry through specially designed "Learn and Earn" approach consisting of a mix of theoretical and On-the-Job Training (OJT) components and hence improve their employability potential & to contribute in the overall growth of automobile and manufacturing industry by creating a pool of skilled resources.

The content broadly covers skills about Automotive Vehicles, Basic Principles of Operations, Parts of Automobile vehicles manufacturing process of Automobile Vehicles Manufacturing processes and quality parameters impacting on manufacturing of the vehicle meeting for today's automobile industry. The year wise course coverage is categorized as below:

FIRST YEAR - In the first year, the contents covered are safety aspects related to trade, familiarization with automobile systems and components, Health, Safety & Environment practices in an Automotive vehicle manufacturing plant, Automobile industries in India, Automobile Process basics skills, different types of vehicles, vehicle Id. Nos. of different components of vehicles, 2- stroke & 4- stroke etc, Illustrate Engine Classification & Recognize types of engine, Petrol & Diesel engine and components. Test engines and take readings, Perform dismantling of engine, inspecting the condition of components and assembling the engine, explain, perform & maintain hand & power tools and equipment used in a workshop & vehicle manufacturing plant and develop skills to assemble components using fasteners. recognize vehicle body parts & components, their functions and assembles components on actual manufacturing lines, explain elements of vehicle manufacturing process used for mass production, develop quality consciousness concepts like metrological terms, instruments & gauges used, inspection & calibration etc execute the Quality parameters linking to vehicle.

SECOND YEAR- Trainee should able to effectively escalate & communicate the Problems to next level, Its impacts on the part, Generation of detailed report using QC Tools, involve in Quality Control Circle Activities, understand & follow the Quality Management System methods like Principles, Basic concepts & Terminology, Demonstrate the capability of best quality process, standardizing the Optimal processes, its assessment & Certifications etc, capable of Planning and organize work illustrate vehicle Inspection process & Perform on job training to various shops, execute the Quality Control & Quality Assurance Process, involve in Shipment Quality Audits & generate a detailed reports, Able to Identify & check the quality defects inward material Inspections wrt vehicle, Able to identify & check the quality defects after the vehicle manufacturing process (Final Line), explain Traffic Rules & Regulations , Safety signs etc,

2.1 GENERAL

The Directorate General of Training (DGT) under Ministry of Skill Development and Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of economy/labor market. DGT is futuristic in preparing the prospective Indian workforce in building skills and capabilities as per the needs of the industry. In this quest, it has changed the paradigm of growth to a job-oriented training by partnering with industry to be an enabler of responsible, sustainable and inclusive growth. Towards this objective, DGT signed this MOU with Industrial Training Partner (ITP).

Automotive Quality Inspection Technician trade under CTS (Flexi-MoU) is of two years' duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory and Practical) imparts professional skills and knowledge, while Core area (Employability Skills) impart requisite core skill, knowledge and life skills. After passing out of the training programme, the trainee is awarded National Trade Certificate (NTC) by DGT under Flexi-MoU which is recognized worldwide.

Industrial Training Partner (ITP) shall conduct courses at the Industry Partner's location. On the Job Training will be conducted inside the Plant premises. It will also ensure the eligible trainees take up Apprenticeship / higher education in suitable streams and shall also guide the students to become Entrepreneurs. Industrial Training Partner (ITP) will strictly follow the policy guidelines for Flexi-MoU as in place from time to time. No deviation for the same would be permitted. Admission and Exam for trades run under Flexi-MoU at training locations of Industrial Training Partner. Theory content is provisioned to be 25% and practical content is provisioned to be 75%.

Trainees broadly need to demonstrate that they are able to:

- Read and interpret technical parameters/documents, plan and organize work processes, identify necessary materials and tools.
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations.
- Apply professional skill, knowledge and employability skills while performing jobs.
- Check the job/assembly as per drawing for functioning identify and rectify errors in job/assembly.
- Document the technical parameters related to the task undertaken.

2.2 PROGRESSION PATHWAYS

- Can join industry as Technician and will progress further as Senior Technician, Supervisor and can rise up to the level of Manager.
- Can become Entrepreneur in the related field.
- Can appear in 10+2 examination through National Institute of Open Schooling (NIOS) for acquiring higher secondary certificate and can go further for General/Technical education.
- Can take admission in diploma course in notified branches of Engineering by lateral entry.
- Can join Apprenticeship programme in different types of industries leading to National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.
- Can join Advanced Diploma (Vocational) courses under DGT as applicable.

2.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during period of two-years:

S No.	Course Element	Notional Training Hours	
		1st Year	2nd Year
1	Professional Skill (Trade Practical)	330	330
2	Professional Knowledge (Trade Theory)	240	240
3	Employability Skills	120	60
4	On the Job Training	840	900
5	Project Work	60	60
	Total	**1590**	**1590**

2.4 ASSESSMENT AND CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of course through formative assessment and at the end of the training programme through summative assessment as notified by the DGT from time to time.

a) The Continuous Assessment (Internal) during the period of training will be done by Formative Assessment Method by testing for assessment criteria listed against learning outcomes. The training institute has to maintain individual *trainee portfolio* as detailed in assessment guideline. The marks of internal assessment will be as per the formative assessment

template provided on www.bharatskills.gov.in.

b) The final assessment will be in the form of summative assessment. The All-India Trade Test for awarding NTC will be conducted by Controller of examinations, DGT as per the guidelines. The pattern and marking structure is being notified by DGT from time to time. The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

For the purposes of determining the overall result, weightage of 100% is applied for six months and one-year duration courses and 50% weightage is applied to each examination for two years courses. The minimum pass percent for Trade Practical and Formative assessment is 60% and for all other subjects is 33%. There will be no grace marks.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/ wastage as per procedure, behavioral attitude, sensitivity to environment and regularity in training. The sensitivity towards OSHE (Occupational Safety and Health Environment) and self-learning attitude are to be considered while assessing competencies.

Assessment will be evidence based, comprising the following:

- Job carried out in labs/workshop
- Record book/daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and Punctuality
- Assignment

Evidences and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examination body. The following marking pattern to be adopted while assessing:

Performance Level	Evidence
(a)Weightage in the range of 60-75% to be allotted during assessment	
For performance in this grade, the candidate should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices.	• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment. • 60-70% accuracy achieved while undertaking different work with those Demanded by the component/job. • A fairly good level of neatness and consistency in the finish. • Occasionalsupport in completing the project/job.
(b)Weightage in the range of above 75%-90% to be allotted during assessment	
For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices.	• Good skill levels in the use of hand tools, machine tools and workshop equipment. • 70-80% accuracy achieved while undertaking different work with those demanded by the component/job. • A good level of neatness and consistency in the finish • Little support in completing the project/job.
(c)Weightage in the range of above 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	• High skill levels in the use of hand tools, machine tools and workshop equipment. • Above 80% accuracy achieved while undertaking different work with those demanded by the component/job. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.

3. JOB ROLE

Brief Description of Job Role:

Automotive Basic Assembly: Automotive Assembly trainees assembles the mechanical sub systems. The individual at work is responsible for assembling mechanical modules from molded, welded or forged components to produce the final mechanical sub assembly of the product.
Assembler (Automobile) assembles different parts and units of automobile, installs them on frame and makes necessary connections, adjustment, settings etc. according to specifications. Assembles engine etc. individually according to specifications and ensures heir stipulated performance. Places body frames, side members, supporting frames etc. in special jigs and secures them tightly by fixing bolts and nuts to different parts.

Quality Control Division: Carry out quality assessment measures of all the products & Process ready for next stage. Take a thorough look at the plans, specifications, to understand the product requirements. Reject all the products that fail to meet quality expectations and report the issue to the concerned department at the earliest. Resolving quality-related issues and adhering to deadlines. Providing training on quality assurance. Prepare documentation of the inspection process, which includes detailed reports and performance records. Recommend improvement measures to the production process to ensure quality control standards are met. Guide the production team about the quality control issues to enhance the quality of the product. Monitor customer satisfaction levels. Monitor the production phase at various levels.

Quality Inspector: An inspector who, in support of and under the direction of quality engineers, supervisors, or technicians, can use the proven techniques (Skill sets) included in the body of knowledge. Under professional direction, the Quality Inspector evaluates hardware documentation, performs laboratory procedures, inspects products, measures process performance, records data and prepares formal reports. This course can be considered as a perfect Entry point for Non-Engineering Students towards Oil & Gas, Marine, Petrochemical, Fabrication, Construction industries & Automobile industries

Quality inspector and Assurance: Must know basic quality terms, definitions and concepts. Must know the definition of PDCA and understand the team concept. Must understand types of measurement, measurement terminology and the different types of measurement scales. Must know the difference between accuracy and precision and be able to select the appropriate measuring tools and techniques. Must know how to measure using surface plate layouts. Must be able to identify/recognize inspection errors and initiate resolution. Must have basic calibration knowledge. Must be able to read and interpret blueprints and know definitions of critical, major and minor characteristics. Must be able to use inspection planning tools and perform a product audit; determine sample size for lots; pull random samples. Must be able to identify and report nonconforming material. Must understand traceability (product, material and calibration).

Reference NCO-2015:

a) 8211.0101 - Automotive Assembly Technician
b) 8211.1200 - Assembler, Automobile
c) 8211.0500 - Assembler, Stationary Petrol Engine
d) 8211.0600 - Assembler, Stationary Diesel Engine
e) 8212.0400 - Assembler, Electrical Accessories

Reference NOS:

a) ASC/N9505
b) ASC/N9554
c) ASC/N9555
d) ASC/N9556
e) ASC/N9557
f) ASC/N9558
g) ASC/N9559
h) ASC/N9560
i) ASC/N9561
j) ASC/N9562
k) ASC/N9563
l) ASC/N9564
m) ASC/N9565

4. GENERAL INFORMATION

Name of the Trade	**Automotive Quality Inspection Technician (Flexi MoU)**
NCO–2015	8211.0101, 8211.1200, 8211.0500, 8211.0600, 8212.0400
Mapped NOS	ASC/N9505, ASC/N9554, ASC/N9555, ASC/N9556, ASC/N9557, ASC/N9558, ASC/N9559, ASC/N9560, ASC/N9561, ASC/N9562, ASC/N9563, ASC/N9564, ASC/N9565
NSQF Level	Level-4
Duration of Craftsmen Training (Instructional Hours)	Two year (3180 Hours)
Entry Qualification	Passed 10th class examination or its equivalent.
Minimum Age	18 years as on first day of academic session.
Unit Strength (No. Of Student)	20
Space Norms	192 Sq M
Power Norms	17 KW
Instructors Qualification for	
(i) Automotive Quality Inspector Trade	B.Voc/ Degree in Automobile/ Mechanical Engg. (with specialization in Automobile) from AICTE/ UGC recognized Engineering College/ university with one-year experience in the relevant field. **OR** Three years Diploma in Automobile/ Mechanical (specialization in automobile) from AICTE recognized board of technical education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field. **OR** NTC/NAC in the related trades with 3 years' experience in the relevant field. **Essential Qualification:** Relevant National Craft Instructor Certificate (NCIC) in any of the variants under DGT. ***NOTE: Out of two Instructors required for the unit of 2(1+1), one must have Degree/Diploma and other must have NTC/NAC***

	qualifications. However, both of them must possess NCIC in any of Its variants.
(ii) Workshop Calculation and Science	B.Voc./Degree in Engineering from AICTE/UGC recognized Engineering College/University with one-year experience in the relevant field. **OR** 03 years Diploma in Engineering from AICTE/recognized board of technical education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field. **OR** NTC/NAC in any one of the engineering trades with three years' experience. **Essential Qualification:** National Craft Instructor Certificate (NCIC)in relevant trade **OR** NCIC in RoDA or any of its variants under DGT
(iii) Engineering Drawing	B.Voc./Degree in Engineering from AICTE/UGC recognized Engineering College/University with one-year experience in the relevant field. **OR** 03 years Diploma in Engineering from AICTE/ recognized board of technical education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field. **OR** NTC/NAC in any one of the Electrical groups (Gr-II) trades categorized under Engg. Drawing'/ D'man Mechanical / D'man Civil' with three years' experience. **Essential Qualification:** National Craft Instructor Certificate (NCIC)in relevant trade **OR** NCIC in RoDA/D'man (Mech/Civil) or any of its variants under DGT.
(iv) Employability Skill	MBA/BBA/Any Graduate/ Diploma in any discipline with Two years' experience with short-term ToT Course in Employability Skills (Must have studied English/Communication Skills and Basic Computer at 12th/Diploma level and above) **OR** Existing Social Studies Instructors in it is with short term ToT Course

	in Employability Skills
(v) Minimum age for Instructor	21 years
List of Tools and Equipment	As per Annexure-I

5. LEARNING OUTCOME

Learning outcomes are a reflection of total competencies of a trainee and assessment will be carried out as per the assessment criteria.

LEARNING OUTCOMES

FIRST YEAR

1. Recognize and comply with general safe working practices, environmental regulations, and housekeeping. (NOS: ASC/N9505)
2. Recognize and comply with health, safety, and environmental practices in a vehicle manufacturing plant. (NOS: ASC/N9505)
3. Identify and explain the automobile industry basics, vehicle types, vehicle ID numbers, engine classifications, and types of engines. (NOS: ASC/N9554)
4. Illustrate petrol engines, test and read vehicle instruments, and perform engine dismantling, inspection, and assembly. (NOS: ASC/N9555)
5. Illustrate diesel engines, test compression and lube oil pressure, and perform engine dismantling, servicing, and assembly. (NOS: ASC/N9555)
6. Perform and maintain hand and power tools and equipment in workshops and vehicle plants, assembling components using fasteners. (NOS: ASC/N9556)
7. Recognize vehicle body parts, components, and their functions, and assemble components on manufacturing lines. (NOS: ASC/N9557)
8. Develop quality consciousness concepts, vehicle error investigation methods, and post-inspection processes. (NOS: ASC/N9558)
9. Interpret productivity concepts, quality tools, and labor welfare legislation, and apply them to improve productivity and Quality Control Circle activities. (NOS: ASC/N9559)
10. Interpret traffic rules, regulations, and safety signs. (NOS: ASC/N9560)
11. Read and apply engineering drawing for different application in the field of work. Read and apply engineering drawing for different application in the field of work. (NOS: CSC/N9401)
12. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. (NOS: CSC/N9402)

SECOND YEAR

13. Develop quality consciousness concepts, including metrological terms, instrument usage, inspection, and calibration. (NOS: ASC/N9561)
14. Escalate and communicate problems, identify defects, assess impacts, and generate detailed reports using QC tools. (NOS: ASC/N9562)
15. Plan and organize work, illustrate the vehicle trim inspection process, and perform on-job training. (NOS: ASC/N9563)
16. Execute the quality inspection process for functional line inspection, ensuring 100% inspection accuracy. (NOS: ASC/N9563)

17. Identify and check quality defects after the vehicle manufacturing process on the final line. (NOS: ASC/N9564)
18. Identify and inspect quality defects in inward materials and during in-process inspections. (NOS: ASC/N9564)
19. Execute quality control and assurance processes, participate in shipment quality audits, and generate detailed reports. (NOS: ASC/N9564)
20. Select appropriate tools, perform the installation of electrical and electronic components in vehicles, check functionality, and recognize automation functions in assembly and material handling. (NOS: ASC/N9565)
21. Perform quality control and inspection tests on assembly and tester lines, conducting final inspections and testing. (NOS: ASC/N9564)
22. Read and apply engineering drawing for different application in the field of work. (NOS: CSC/N9401)
23. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. (NOS: CSC/N9402)

6. ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
FIRST YEAR	
1. Recognize and comply with general safe working practices, environmental regulations, and housekeeping. (NOS: ASC/N9505)	Practice and understand precautions to be followed while working on the assembly line.
	Safe use of equipment generally used in assembly line with operating standard.
	Understand class of fire and be able to operate fire extinguishers.
	Practical use and understanding of PPEs.
2. Recognize and comply with health, safety, and environmental practices in a vehicle manufacturing plant. (NOS: ASC/N9505)	Plant and personal safety demonstration.
	Safe use of equipment generally used in assembly line.
	Maintaining health and safety for workers in assembly line.
	Emergency and evacuation procedures to be followed in the assembly line.
	First-Aid, nature and causes of injury and utilization of first-aid.
	Safety: - its importance, classification, personal, general.
3. Identify and explain the automobile industry basics, vehicle types, vehicle ID numbers, engine classifications, and types of engines. (NOS: ASC/N9554)	Identification of different types of vehicle.
	Identification of Vehicle Identification Number, Chassis No. & Engine no.
	Identification of different types of vehicle and engine components.
	Identify the different vehicle specification data and information.
	Demonstrate the garage, service station different equipment.
	Demonstrate safe handling of lifting equipment's.
	Demonstrate safe assembly basic skills
4. Illustrate petrol engines, test and read vehicle instruments, and perform engine dismantling, inspection, and assembly. (NOS: ASC/N9555)	Identification of petrol engine Components.
	Study on Procedure of Dismantling and assembling Petrol engines.
	Removing a petrol engine parts. Dismantling cylinder head for inspection.
	Removing of piston and Connecting rods from engine. Check Piston rings and piston condition as per service manual.
	Checking cylinder bore wear for Ovality and taper.
	Checking valves and valve springs
	Assembling valves and cylinder head and adjusting tappet clearance in engine.
	Dismantle complete engine and their components.

5. Illustrate diesel engines, test compression and lube oil pressure, and perform engine dismantling, servicing, and assembly. (NOS: ASC/N9555)	Check / test cylinder head & block war page, valve leak, bearing (oil) clearance, measure bore & take decision for further action, replace – liner, valve guide, piston rings, check ring end gap& side clearance, check cam & crank shaft bend & valve timing.
	Overhauling of cylinder head assembly, use of service manual for clearance and other parameters, practice on removing rocker arm assembly manifolds
	Remove the valves and its parts from the cylinder head, cleaning.
	Inspection of cylinder head and manifold surfaces for warping, cracks and flatness.
	Checking valve seats & valve guide –replacing the valve if necessary.
	Testing leaks of valve seats for leakage –dismantle rocker shaft assembly -clean & check rocker shaft-and levers, for wear and cracks and reassemble.
	Check valve springs, tappets, push rods, tappet screws and valve stem cap.
	Reassembling valve parts in sequence, cylinder head and manifold & rocker arm assembly, adjustable valve clearances, starting engine after adjustments.
6. Perform and maintain hand and power tools and equipment in workshops and vehicle plants, assembling components using fasteners. (NOS: ASC/N9556)	Working with tools used in vehicle assembly.
	Working with Electric & pneumatic powered tools.
	Using wrench, screwdriver and pliers.
	Use of spanners, Allen key, Special tools.
	Understanding of types and sizes of fasteners and picking of defined number of fasteners.
	Gap setting and checking with feeler Gauge.
	Operating of Impactors and supporting machines.
	Practice on different types of Conveyor
7. Recognize vehicle body parts, components, and their functions, and assemble components on manufacturing lines. (NOS: ASC/N9557)	On the job training on the actual manufacturing lines
	Identifying various components their function assembly and fitment procedure.
8. Develop quality consciousness concepts, vehicle error investigation	Discuss organizational quality inspection standards and processes & the information collected from the inspection check sheet, manufacturing drawings; Vehicle specifications/detail drawings; applicable national and international standards;

methods, and post-inspection processes. (NOS: ASC/N9558)	Production process procedure specification and how to confirm it from the superior.
	List testing equipment, measuring instruments, gauges, parts etc. required during the quality inspection process.
	Discuss the organizational process of collecting and arranging the testing equipment, measuring instruments, gauges, parts etc. from the store.
9. Interpret productivity concepts, quality tools, and labor welfare legislation, and apply them to improve productivity and Quality Control Circle activities. (NOS: ASC/N9559)	Explain the concept of productivity and quality tools and apply during execution of job.
	Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.
	Knows benefits guaranteed under various acts.
10. Interpret traffic rules, regulations, and safety signs. (NOS: ASC/N9560)	Four wheel vehicle driving lessons theory.
	Basic details about Regional Transport Office & Vehicle Documents Identify Traffic sign and traffic rules.
11. Read and apply engineering drawing for different application in the field of work. (NOS: CSC/N9401)	Read & interpret the information on drawings and apply in executing practical work.
	Read & analyze the specification to ascertain the material requirement, tools and assembly/ maintenance parameters.
	Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension / parameters to carry out the work.
12. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. (NOS: CSC/N9402)	Solve different mathematical problems
	Explain concept of basic science related to the field of study
SECOND YEAR	
13. Develop quality consciousness concepts, including metrological	Metrology Inspection, Accuracy and Precision, Standards of Measurement.
	Screw Thread Measurement: Errors in threads, screw thread gauges, measurement of element of the external and internal threads, thread

terms, instrument usage, inspection, and calibration. (NOS: ASC/N9561)	caliper gauges.
	Surface finish: Surface Metrology Concepts and terminology, Analysis of surface traces, Specification of surface Texture characteristics, and Method of measuring.
	Sensory inspection.
14. Escalate and communicate problems, identify defects, assess impacts, and generate detailed reports using QC tools. (NOS: ASC/N9562)	Understand the type of defect which can affect the product &Process.
	Develop a simple & detailed Quality report on the Process.
	Communicate the Reports across the team.
	Involve in Route cause analysis for the defects.
	Support for finding out the countermeasures & implement the measures.
15. Plan and organize work, illustrate the vehicle trim inspection process, and perform on-job training. (NOS: ASC/N9563)	Static Inspection of Assembly, fitting, specification etc.
	Flow of Trim Inspection and Process
	Introduction to Trim line (100% inspection) skill set
	Handle basic inspection instruments and skills
16. Execute the quality inspection process for functional line inspection, ensuring 100% inspection accuracy. (NOS: ASC/N9563)	Inspection and adjustment of vehicle
	Various types of inspection devices (testers) to confirm that the basic vehicle functions (Running, turning, stopping)
	On the job training on the actual Process of Final Line. Real time data entry and communication.
17. Identify and check quality defects after the vehicle manufacturing process on the final line. (NOS: ASC/N9564)	On the job training on the actual Process of Final Line. (Shower Tester, Blower Tester)
	Real time data entry and communication.
18. Identify and inspect quality defects in inward materials and during in-process inspections. (NOS: ASC/N9564)	Understand the inward material requirements and Internal in process audit system.
	Apply the knowledge & skill of measuring instruments to check the inward material.
	Generate a detailed report and execute the documentation activities.
19. Execute quality control and assurance processes, participate in shipment	Understand the SQA Audit Purpose & Objective
	Execute the SQA Audit process activities.
	Generate a detailed report and execute the documentation activities.

quality audits, and generate detailed reports. (NOS: ASC/N9564)	On the job training on the actual Process in different areas and identifying various QC & QA activities
20. Select appropriate tools, perform the installation of electrical and electronic components in vehicles, check functionality, and recognize automation functions in assembly and material handling. (NOS: ASC/N9565)	Understand the process requirements.
	Execute the activities as per the SOP
	Generate the reports based on the organization requirements.
21. Perform quality control and inspection tests on assembly and tester lines, conducting final inspections and testing. (NOS: ASC/N9564)	Understand the process requirements.
	Execute the activities as per the SOP
	Generate the reports based on the organization requirements.
22. Read and apply engineering drawing for different application in the field of work. (NOS: CSC/N9401)	Read & interpret the information on drawings and apply in executing practical work.
	Read &analyze the specification to ascertain the material requirement, tools and assembly/maintenance parameters.
	Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.
23. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. (NOS: CSC/N9402)	Solve different mathematical problems
	Explain concept of basic science related to the field of study

SYLLABUS – AUTOMOTIVE QUALITY INSPECTION TECHNICIAN (FLEXI-MOU)			
FIRST YEAR			
Duration	**Reference Learning Outcomes**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
Professional Skill 15 Hrs. Professional Knowledge 05 Hrs. On the Job Training 40 Hrs.	Recognize and comply with general safe working practices, environmental regulations, and housekeeping.	**Workshop Safety** 1. Interpret importance of trade training, List of tools & Machinery used in the trade. 2. Develop Safety attitude to use Personal Protective Equipment (PPE). 3. Apply First Aid Method and basic training. 4. Perform Safe disposal of waste materials like cotton waste, metal chips/burrs etc. 5. Identify Hazard and avoidance. 6. Safety signs for Danger, Warning, caution & personal safety message. 7. Preventive measures for electrical accidents & steps to be taken in such accidents. 8. Use of Fire extinguishers. 9. Practice and understand precautions to be followed while working in fitting jobs. 10. Safe use of tools and equipment used in the trade.	**Workshop Safety** • All necessary guidance to be provided to the newcomers to become familiar with the working of Industrial Training Institute system including stores procedures. • Soft Skills, its importance and Job area after completion of training. • Importance of safety and general precautions observed in the in the industry/shop floor. • Introduction of First aid. • Operation of electrical mains and electrical safety. Introduction of PPEs. • Response to emergencies e.g.; power failure, fire, and system failure. • Importance of Housekeeping & good shop floor practices. Introduction to 5S concept & its application. • Occupational Safety & Health: Health, Safety and Environment guidelines, legislations & regulations as applicable.
Professional	Recognize and	**Health and safety in**	**Health and safety in**

Skill 15 Hrs. Professional Knowledge 05 Hrs. On the Job Training 40 Hrs.	comply with health, safety, and environmental practices in a vehicle manufacturing plant.	**Manufacturing Environment** 11. Practice and understand precautions to be followed while working in assembly line 12. Safe use of equipment generally used in assembly line with operating standard. 13. Understand class of fire and be able to operate fire extinguishers. 14. Practical use and understanding of PPEs. 15. Plant and personal safety demonstration.	**Manufacturing Environment** • Precautions to be followed while working in assembly Line • Safe use of equipment generally used in assembly line • Maintaining health and safety for workers in assembly line • Emergency and evacuation procedures to be followed in the assembly line • First-Aid, nature and causes of injury and utilization of first-aid. • Safety, its importance, classification, personal, general, workshop and machine safety. • Safety signs and norms. • Fires: - types, causes, classes • Use of personal protective Equipment (PPE), standardization
Professional Skill 45 Hrs. Professional Knowledge 25 Hrs. On the Job Training 110 Hrs.	Identify and explain the automobile industry basics, vehicle types, vehicle ID numbers, engine classifications, and types of engines.	**Basics of Automobile and Manufacturing Process** 16. Identification of different types of Automobiles. 17. Automobile assembly process basic 18. Identification of Vehicle Identification Number, Chassis No. & Engine no 19. Identification of different types of vehicle and engine components. 20. Familiarization with	**Manufacturing Process** • Knowledge about automobile industry • Basic automotive terms and familiarization to various types of vehicles • Basics of Vehicle manufacturing process • Basics of Stamping process • Basics of Welding process • Basics of Painting process • Basics of Assembly process • Engine series such as ZZ

		different components in the vehicle 21. Recognize Engine series 22. Recognize Engine types with respect to; • Type of fuel • Cycle of operation • Number of strokes per cycle • Type of ignition • No. of cylinders • Arrangement of cylinders • Valve arrangement • Type of cooling	series, and KD series. • Engine types with respect to; ➢ Type of fuel ➢ Cycle of operation ➢ Number of strokes per cycle ➢ Type of ignition ➢ No. of cylinders ➢ Arrangement of cylinders ➢ Valve arrangement ➢ Type of cooling
Professional Skill 35 Hrs. Professional Knowledge 20 Hrs. On the Job Training 95 Hrs.	Illustrate petrol engines, test and read vehicle instruments, and perform engine dismantling, inspection, and assembly.	**Basics of Automobile and Petrol Engine** 23. Identification of petrol engine Components. 24. Study on Procedure of Dismantling and assembling Petrol engines 25. Removing a petrol engine from a Motor vehicle. Dismantling cylinder head for inspection. 26. Removing of piston and Connecting rods from engine. Check Piston rings and piston condition as per service manual 27. Checking cylinder bore wear for Oval-T and taper 28. Checking valves and valve springs, 29. Assembling valves and cylinder head and adjusting tappet clearance in engine.	**Basics of Automobile and Petrol Engine** • 4-stroke spark-ignition engines- basic, 4-stroke principles. • Spark-ignition engine components basic engine components, engine cams & cam shaft, engine power transfer, and engine components. • Intake & exhaust systems – carbureted systems, electronic fuel injection systems, exhaust systems. Intake system components, air cleaners, • Carburetor, / MPFI self-starting system components and sensors. • Gasoline fuel systems: description of Gasoline fuel, gasoline fuel characteristics, stoichiometric ratio, fuel supply system.

Professional Skill 35 Hrs. Professional Knowledge 20 Hrs. On the Job Training 95 Hrs.	Illustrate diesel engines, test compression and lube oil pressure, and perform engine dismantling, servicing, and assembly.	30. Dismantle complete engine and their components 31. Check / test cylinder head & block warpage, valve leak, bearing (oil) clearance, measure bore & take decision for further action, replace – liner, valve guide, piston rings, check ring end gap & side clearance, check cam &crank shaft bend & valve timing 32. Overhauling of cylinder head assembly, use of service manual for clearance and other parameters, practice on removing rocker arm assembly manifolds. 33. Remove the valves and its parts from the cylinder head, cleaning. 34. Inspection of cylinder head and manifold surfaces for warping, cracks, and flatness. Checking valve seats & valve guide –replacing the valve if necessary. Testing leaks of valve seats for leakage – dismantle rocker shaft assembly -clean & check rocker shaft-and levers, for wear and cracks and reassemble. Check valve springs, tappets, push rods, tappet screws and valve	• Description and constructional feature of cylinder head, importance of cylinder head design, type of diesel combustion chambers, effect on size of intake & exhaust passages, head gaskets. • Importance of turbulence. Turbocharger & oil cooler • Valves & valve trains- description and Function of engine valves, different types, materials, type valve operating mechanism, importance of valve seats, valve seats inserts in cylinder heads, importance of valve rotation, valve stem oil seals, size of intake valves, valve trains, valve-timing diagram, concept of variable valve timing. Description of camshafts & drives, description of overhead camshaft, importance of cam lobes, timing belts &chains, timing belts & tensioners. • Procedure for – dismantling, checking, • Assembling & testing of diesel engines

		stem cap. Reassembling valve parts in sequence, cylinder head and manifold & rocker arm assembly, adjustable valve clearances, starting engine after adjustments.	
Professional Skill 35 Hrs. Professional Knowledge 20 Hrs. On the Job Training 95 Hrs.	Perform and maintain hand and power tools and equipment in workshops and vehicle plants, assembling components using fasteners.	35. Practice working with tools used in vehicle assembly. 36. Practice working with pneumatic tools, 37. Working with hand drill, hammer punches and chisel 38. Practical with drill reamer and tap 39. Practical with wrench screwdriver and pliers 40. Use of Allen key 41. Understanding of types and sizes of fasteners and picking of defined number of fasteners 42. Gap setting and checking with feeler Gauge 43. Operating of spot-welding guns and other welding machines 44. Precision measuring instruments, Vernier caliper, bore gauge, DTI, feeler gauge, outside micrometer. Caliper types. 45. Practice on different types of Conveyor 46. Overhauling and measuring engine component.	• Common tools and material used in assembly Process • Types and sizes of spanners and screw drivers and Allen keys Taps wrenches and dies, Gauges, Files, Drilling machines and drills, Cutting machines, Pneumatic guns, Measuring instruments, Special purpose tools, Fasteners, General equipment in assembly shop, Hydraulic presses and screw jack, Special purpose machines.
Professional	Recognize vehicle	47. On the job training	• Structure of car vehicle

Skill 35 Hrs. Professional Knowledge 20 Hrs. On the Job Training 95 Hrs.	body parts, components, and their functions, and assemble components on manufacturing lines.	on the actual manufacturing lines and identifying various components their function assembly and fitment procedure.	body • Component installation in power train and its explanation • Engine classification, mountings, transmission, driveshaft, propeller shaft, Differential, Clutch and Various joints • Suspension components Construction of various components in power train
Professional Skill 45 Hrs. Professional Knowledge 25 Hrs. On the Job Training 110 Hrs.	Develop quality consciousness concepts, vehicle error investigation methods, and post-inspection processes.	**Inspect quality and dimensional accuracy of manufactured** 48. Demonstrate the standard operating procedures to use the testing equipment, measuring instruments, gauges, parts etc. required during the quality inspection process. 49. Show how to collect the required testing equipment, measuring instruments, gauges, parts etc. from the store. 50. Apply appropriate ways of checking the calibration of tools, gauges and measuring instruments before use. 51. Show how to prepare/collect different production/product related data required for inspection. 52. Show how to visually inspect the component	**Inspect quality and dimensional accuracy of manufactured** • Discuss organizational quality inspection standards and processes & the information collected from the inspection check sheet, manufacturing drawings; Vehicle specifications/detail drawings; applicable national and international standards; Production process procedure specification and how to confirm it from the superior. • Discuss the organizational process of collecting and arranging the testing equipment, measuring instruments, gauges, parts etc. from the store. • Summaries the steps to be performed for checking the calibration of tools, gauges and measuring instruments before use. • Discuss the safety practices to avoid any hazard and

		for scratches, damages, packing etc. 53. Perform the steps to inspect the dimensions and function of component.	accident during quality inspection activities. • Discuss various manufactured components, their specifications and features need to be inspected in industry.
Professional Skill 45 Hrs. Professional Knowledge 25 Hrs. On the Job Training 110 Hrs.	Interpret productivity concepts, quality tools, and labor welfare legislation, and apply them to improve productivity and Quality Control Circle activities.	**Concept In Productivity Quality tools** 54. Exercises on Case study 55. Exercises on Mistake Proofing 56. Exercises on use of QC 7 tools 57. Exercises on MSA	**Concept In Productivity Quality tools** • Concept of Quality, Quality Policy • IMPORTANCE QUALTIY • The 'Customer First' philosophy • Problem solving methodology - Concept of mistake proofing QC7 tools - Introduction to MSA (Measuring System Analysis)
Professional Skill 25 Hrs. Professional Knowledge 15 Hrs. On the Job Training 50 Hrs.	Interpret traffic rules, regulations, and safety signs.	**Traffic rules and Regulation** 58. Four-wheel vehicle driving lessons. 59. Identify Traffic sign and traffic rules	Traffic rules and Regulation • Four-wheel vehicle driving lessons theory. • RTO details and basic vehicle documents, Name plates and color coding of name plates • Traffic sign and traffic rules.
ENGINEERING DRAWING: 30 HRS.			
Professional Knowledge ED- 30 Hrs.	Read and apply engineering drawing for different application in the field of work.	Introduction to Engineering Drawing and Drawing Instruments – Conventions Sizes and layout of drawing sheets Title Block, its position and content Drawing Instrument Lines- Types and applications in drawing Free hand drawing of – Geometrical figures and blocks with dimension Transferring measurement from the given object to the free hand sketches. Free hand drawing of hand tools and measuring tools.	

		Drawing of Geometrical figures: Angle, Triangle, Circle, Rectangle, Square, Parallelogram. Lettering & Numbering – Single Stroke. Dimensioning Types of arrowhead Leader line with text Position of dimensioning (Unidirectional, Aligned) Symbolic representation – Different symbols used in the related trades. Concept and reading of Drawing in Concept of axes plane and quadrant Concept of Orthographic and Isometric projections Method of first angle and third angle projections (definition and difference) Reading of Job drawing of related trades.
WORKSHOP CALCULATION AND SCIENCE: 30 HRS		
Professional Knowledge WCS- 30 Hrs.	Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study.	**Unit, Fractions** Classification of unit system Fundamental and Derived units F.P.S, C.G.S, M.K.S and SI units Measurement units and conversion Factors, HCF, LCM and problems Fractions - Addition, substraction, multiplication & division Decimal fractions - Addition, subtraction, multilipication & division Solving problems by using calculator **Square root, Ratio and Proportions, Percentage** Square and suare root Simple problems using calculator Applications of pythagoras theorem and related problems Ratio and proportion Ratio and proportion - Direct and indirect proportions Percentage Precentage - Changing percentage to decimal and fraction **Material Science** Types metals, types of ferrous and non ferrous metals Physical and mechanical properties of metals **Mass, Weight, Volume and Density** Mass, volume, density, weight and specific gravity, numerical related to L,C,O section only Related problems for mass, volume, density, weight and specific gravity

		Speed and Velocity, Work, Power and Energy Speed and velocity - Rest, motion, speed, velocity, difference between speed and velocity, acceleration and retardation Speed and velocity - Related problems on speed & velocity Work, power, energy, HP, IHP, BHP and efficiency **Heat & Temperature and Pressure** Concept of heat and temperature, effects of heat, difference between heat and temperature, boiling point & melting point of different metals and non-metals Concept of pressure - Units of pressure, atmospheric pressure, absolute pressure, gauge pressure and gauges used for measuring pressure **Basic Electricity** Introduction and uses of electricity, electric current AC, DC their comparison, voltage, resistance and their units **Mensuration** Area and perimeter of square, rectangle and parallelogram Surface area and volume of solids - cube, cuboid, cylinder, sphere and hollow cylinder Finding the lateral surface area, total surface area and capacity in litres of hexagonal, conical and cylindrical shaped vessels **Levers and Simple machines** Simple machines - Effort and load, mechanical advantage, velocity ratio, efficiency of machine, relationship between efficiency, velocity ratio and mechanical advantage Lever & Simple machines - Lever and its types **Trigonometry** Measurement of angles Trigonometrical ratios Trigonometrical tables
Project work 60 Hrs.	a) Make a chart showing different types of vehicles/ automobiles & power train in a vehicle b) Prepare models of different types Production process c) Prepare chart explaining about Traffic rules and regulation & model of steering system Examination	
Note: The duration of Professional skills (Trade practical), Professional knowledge (Trade theory) and On the Job Training are indicative only. The Training Institute has the flexibility to adopt suitable training duration for effective training.		

SYLLABUS – AUTOMOTIVE QUALITY INSPECTION TECHNICIAN (FLEXI MoU)			
SECOND YEAR			
Duration	**Reference Learning Outcomes**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
Professional Skill 40 Hrs. Professional Knowledge 20 Hrs. On the Job Training 150 Hrs.	Develop quality consciousness concepts, including metrological terms, instrument usage, inspection, and calibration.13	**Concepts of metrological Measurements and calibration** 60. Physical introduction to measuring instruments 61. Handle instruments - exercises in the Use Linear measuring instruments such as Steel rule of different ranges. 62. Outside calipers, inside calipers for measuring inside, outside parameters. 63. Vernier calipers - Least count, exercise in outside measurement, inside measurement s, depth gauge. Sensory inspection	**Concepts of metrological Measurements and calibration** • Introduction to Metrology, Objectives of Metrology - measurements - principles -methods of measurement. Terminology used in Metrology -Accuracy • Repeatability - Resolution etc. SI units of measurements - physical quantities under SI system About Sensory Inspection
Professional Skill 55 Hrs. Professional Knowledge 20 Hrs. On the Job Training 135 Hrs.	Escalate and communicate problems, identify defects, assess impacts, and generate detailed reports using QC tools.14	**Effective communication and defect identification** 64. Defect identification 65. Defect communication, 66. Preparation of reports 67. Feedback – 4R 68. Quality Performance Assessment & Quality Assurance Network 69. Quality confirmation stage	**Effective communication and defect identification** • Read and interpret information correct • Conduct meeting for group members and give the appropriate instruction about work • Write and read technical forms, process chart. • convey and share technical information clearly using appropriate language • Analyze and clarify task-related information

			• Inform correct protocol to higher authority • Ensure communicate with people in respectful form and manner in line with organizational protocol • Clearly identify questions and concerns of the customer and provide resolution in a respectful manner as per organizational guidelines • Use basic office applications like spread sheet, word processor, presentations.
Professional Skill 56 Hrs. Professional Knowledge 29 Hrs. On the Job Training 155 Hrs.	Plan and organize work, illustrate the vehicle trim inspection process, and perform on-job training.15	**Illustrate of Trim inspection process** 70. Introduction to Trim line (100% inspection) skill set 71. Handle basic inspection instruments and skills Specification, Appearance, Engine compartment, Interior and Exterior and painting. 72. Static Inspection of Assembly, fitting, specification etc.	• Illustrate of Trim inspection process • Quality Control Mission • Quality Control Division is Organized • The role of the Inspection Section • What is INSPECTION & Flow of Trim Inspection and Process
Professional Skill 40 Hrs. Professional Knowledge 20 Hrs. On the Job Training 90 Hrs.	Execute the quality inspection process for functional line inspection, ensuring 100% inspection accuracy.16	**Illustrate of Functional inspection process** 73. Introduction to Functional line skill set 74. Toe adjustment, Headlamp adjustment, Roller testing, brake, emission, and Engine compartment. 75. All vehicle inspected for basic function like running, turning and	**Illustrate of Functional inspection process** • Inspection and adjustment of vehicle functions • Understanding flow of vehicle function inspection devices and operation correctly and to judge that as per inspection standards • The Attitude an Inspector Need Correct Inspection

		stopping.	• Quality Abnormalities
Professional Skill 40 Hrs. Professional Knowledge 20 Hrs. On the Job Training 90 Hrs.	Identify and check quality defects after the vehicle manufacturing process on the final line.17	**Illustrate of Final inspection process** 76. Defect identification, Data Entry, Air bag, shower, and blower test 77. Defect communication, Preparation of daily performance statics 78. Rope Road and noise testing	**Illustrate of Final inspection process** • About water leak • Final check of vehicle with check sheet • Vin plate confirmation • Quality performance assessment
Professional Skill 27 Hrs. Professional Knowledge 18 Hrs. On the Job Training 75 Hrs.	Identify and inspect quality defects in inward materials and during in-process inspections.18	**Illustrate of in process Inspection** 79. Determine whether quality activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives. (Stamping, Welding, Painting, Assembly and Inspection)	**Illustrate of In process Inspection** • Work and information flow in inprocess - Audit • Parts Inspection & Material inspection, Drawing reading and parts studies • How to ensure the quality of the raw material • Material Lap test and calibration activities
Professional Skill 35 Hrs. Professional Knowledge 20 Hrs. On the Job Training 95 Hrs.	Execute quality control and assurance processes, participate in shipment quality audits, and generate detailed reports.19	**Quality Control & Quality Assurance** 80. Establish and Improve Quality assurance system 81. Issuance of Quality information Customer Quality Handling 82. Attending to regulation authorities	**Quality Control & Quality Assurance** • Implementation of Inspection and audit • Dealing with non-confirming parts and vehicle • Training and education of inspector and auditor
Professional Skill 15 Hrs. Professional Knowledge	Select appropriate tools, perform the installation of electrical and electronic	**Electrical and Electronics components** 83. Installation of electrical components in vehicle 84. Installation of electronic	• Electrical and Electronics components • Basics of Electrical and Electronic Engineering, Current voltage and

15 Hrs. On the Job Training 60 Hrs.	components in vehicles, check functionality, and recognize automation functions in assembly and material handling.20	components in vehicle 85. Function of automation equipment in vehicle 86. Function of automation equipment in material handling 87. Function of automation equipment in testing	resistance • Ohm's Law, Types of Electrical Materials, Direct Current and Alternating current • Function of current, Heat generation action, Chemical Action, Magnetic Action • Parallel and Series connections, Function and working principal of electrical components in vehicle • Alternator, Distributor, Wiper Motor, Wiring Harness and Connectors • Function and working principle of electronic components in vehicle • Electronic Control Module, Sensors and actuators, Air Bags, ABS & EBD • Electronic power steering, Function of automation equipment in vehicle • Function of automation equipment in material handling • Function of automation equipment in testing
Professional Skill 22 Hrs. Professional Knowledge 18 Hrs. On the Job Training 50 Hrs.	Perform quality control and inspection tests on assembly and tester lines, conducting final inspections and testing.21	**Different Types Quality control and inspection** 88. Vehicle parts material testing on plant tester line. 89. Understand the lab test related to steel, oil and material.	**Different Types Quality control and inspection** • Right Inspection, procedure Safety should not be disregarded, Standard should not be disregarded • Abnormality identification ability Aim at improvement as an

			inspector.
ENGINEERING DRAWING: 30 HRS.			
Professional Knowledge ED- 30 Hrs.	Read and apply engineering drawing for different application in the field of work.	Reading of Electrical, Electronic & Mechanical Sign and Symbols used in Automobile. Sketches of Electrical, Electronic & Mechanical components used in Automobile. Reading of Electrical wiring diagram and Layout diagram used in Automobile. Drawing of Electrical circuit diagram used in Automobile. Drawing of Block diagram of Instruments & equipment of trades	
WORKSHOP CALCULATION AND SCIENCE: 30 HRS.			
Professional Knowledge WCS-30 Hrs.	Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study.	**Friction** Friction - Advantages and disadvantages, simple problems related to friction Friction - Lubrication **Estimation and Costing** Estimation and costing - Simple estimation of the requirement of material etc., as applicable to the trade Estimation and costing - Problems on estimation and costing	
Project work 60 Hrs.			
Note: The duration of Professional skills (Trade practical), Professional knowledge (Trade theory) and On the Job Training are indicative only. The Training Institute has the flexibility to adopt suitable training duration for effective training.			

SYLLABUS (CORE SKILLS)
Employability Skills (Common for all CTS trades) (120 Hrs.+ 60 Hrs.)

Learning outcomes, assessment criteria, syllabus and tool list of core skill subjects which are common for a group of trades, provided separately in www.bharatskills.gov.in / www.dgt.gov.in

ANNEXURE-I

List of Tools and Equipment			
AUTOMOTIVE QUALITY INSPECTION TECHNICIAN (for batch of 20 candidates)			
Sl. No.	**Name of the Tools and Equipment**	**Specification**	**Quantity**
A. TOOLS, EQUIPMENT, MACHINERIES AND VEHICLES			
1.	Double ended spanner set	6-32mm	8 set
2.	Ring spanner set	6-32mm	8 set
3.	Tubular spanners	8,10,12,14,16,17mm	8 nos.
4.	Socket spanners	6-32 mm with T bar and ratchet	8 set
5.	Allen keys	4-12mm in steps of 2mm	8 set
6.	Screwdriver (flat)	20cm x 9mm blade	8 nos.
7.	Screwdriver (flat)	30cm x 9 mm blade	8 nos.
8.	Screwdriver (Philips type)	100 -300mm set of 5 pieces	8 set
9.	Hammer ball peen	0.75 kg	8 nos.
10.	Mallet hammer		8 nos.
11.	Hammer Nylon		8 nos.
12.	Nose plier straight	15 cm	8 nos.
13.	Combination plier	15 cm	8 nos.
14.	Circlip plier external & contracting	6”	5 nos.
15.	Circlip plier external & contracting	7”	5 nos.
16.	Feeler gauge	20 blades metric	8 nos.
17.	Adjustable spanner	20 cm	8 nos.
18.	Spark plug spanner	12,14,17mm	8 nos.
19.	Knife Edge		5 set
20.	Pneumatic/ Impact wrench		6 nos.
21.	Battery impact		5 nos.
22.	Socket set		8 nos.
23.	Screw Bit set		20 nos.
24.	Torque wrench	0-50 NM	8 no.
25.	Digital Multi meter		2 no.
26.	Tappet adjuster		8 no.
27.	Puller Set		8 nos.
28.	Impact screwdriver for flat and Philips type		8 set
29.	Pneumatic tire inflator		2 set
30.	Measuring Jars (Different capacity)		1 Set

31.	2 post lift	3 ton capacity	4 nos.
32.	Desktop computers for Basic training		8 nos.
33.	Engine (Petrol 1ZZFE) for dismantling and assembly		8 nos.
34.	Engine (Diesel 2KD) for dismantling and assembly		8 nos.
35.	4-Wheeler vehicle (Monocoque)		4 nos.
36.	4-Wheeler vehicle (Frame)		4 nos.
37.	Micro meter		8 nos.
38.	Vernier Caliper		8 nos.
39.	Height gauge and Height Master		4 nos. + 1
40.	Bore dial gauge		4 nos.
41.	Digital Torque wrench		8 nos.
B. LIST OF MACHINE AND EQUIPMENT			
42.	Wheel balancer		1 no.
43.	Exhaust gas Analyzer		1 no.
44.	Car Washer		1 no.
45.	Brake Bleeding Equipment		1 no.
46.	Air compressor	200 liters capacity	1 no.
47.	Battery Tester & battery charger		2 nos.
48.	Hydro meter		3 no.
49.	Hydraulic Press		1 no.
50.	TRG – Turning Radius gauge		1 no.
51.	CCK – Caster, camber & kingpin angle inclination set		1 no.
52.	Green Power Jump starter		1 no.
53.	Tightening Torque Training Tables		1 no.
54.	Fluid Identification Training Tables		1 no.
55.	Hose Inspection and training tables		1 no.
56.	Connector coupling Inspection and training tables		1 no.
57.	Gap and Levelness Inspection and training tables		1 no.
58.	Specification Inspection and training tables		1 no.
59.	Body surface Inspection and training tables		1 no.
60.	Vehicle attachment and sticker Inspection and training tables		1 no.
61.	Hose Inspection and training tables		1 no.
62.	Vehicle clip and trims Inspection and training tables		1 no.

63.	Measuring Surface Plates		2 nos.
64.	Vehicle Reservoir level confirmation training tables		1 no.
65.	SUV vehicles		4 nos.

Note: -

1. *All the tools and equipment are to be procured as per BIS specification.*
2. *Internet facility is desired to be provided in the class room.*

ABBREVIATIONS

CTS	Craftsmen Training Scheme
ATS	Apprenticeship Training Scheme
CITS	Craft Instructor Training Scheme
DGT	Directorate General of Training
MSDE	Ministry of Skill Development and Entrepreneurship
NTC	National Trade Certificate
NAC	National Apprenticeship Certificate
NCIC	National Craft Instructor Certificate
LD	Locomotor Disability
CP	Cerebral Palsy
MD	Multiple Disabilities
LV	Low Vision
HH	Hard of Hearing
ID	Intellectual Disabilities
LC	Leprosy Cured
SLD	Specific Learning Disabilities
DW	Dwarfisms
MI	Mental Illness
AA	Acid Attack
PwD	Person with disabilities