



Gujarat Council of Vocational Training Gandhinagar



1. Name of Course:

Web based Interaction of Automotive Program

NUO No. for Skills Covered
(Please refer National Classification of
Occupations -2004 available
on www.dget.mca.gov)

2. Engineering OR Non-engineering: Engineering

3. No. of students per batch: 20

4. Duration in Hours. : 48

5. Duration in Week : 1 (8 Hours/Day)

6. Examination Scheme:

No.	Name of Subject	Teaching Hours during full course.	Maximum Marks. (Excluding Sessional)	Minimum Marks required for Passing (Excluding Sessional).	Sessional Marks if any.
Subject-1	Course Theory	16	50	20	
Subject-2	Course Practical	32	100	60	
Subject-3					
Subject-4					
Subject-5					

7. Entry qualification for Trainee:

Minimum entry qualification (Essential): 10th Pass Diploma B. Tech.

Desirable: Basic Knowledge (Technical / Non-Technical)

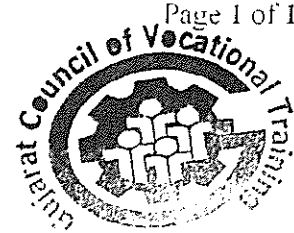
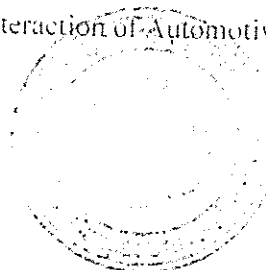
8. Minimum qualification for Trainer:

Minimum qualification (Essential): Diploma Engg. (Mechanical/Electronics)

Desirable: Technical Knowledge

Web based Interaction of Automotive Program

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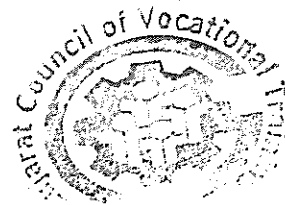
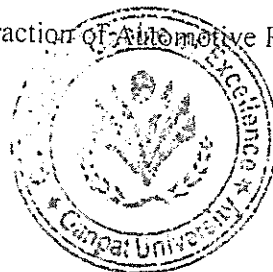


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3. Syllabus Committee Member:

Sr. No	Name	Organization	Designation	Technical Qualification	Experience in Years	Signature
1.	Mr. Chetan Rajdev	Bosch Rexroth India Ltd. Sanand	DGM	BE (Mech.)	20	
2.	Nitin Sapre	Bosch Rexroth India Ltd. Sanand	Sr. Manager	M.Tech. PhD(Pursuing)	23	
3.	Dr. J.P.Patel	Ganpat University	HOD (Mkt.)	PhD	17	
4.	D.I.Patel	ITI, Mehsana	SI	Diploma	20	
5.	C.K.Chauhan	ITI, Mehsana	Principal	Diploma	20	





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10. Terminal Skills of trainee: (Should be well defined and having reference to NCO):

The trainee, after successful completion of training, will have following skills...

1. On successful completion of training one should be able to Design a system
Trouble shoot the system in Automation.
2. Technical Skill will help to get recruited in a reputed organization.
3. Using this technical expertise he can become an entrepreneur.
4. Technical Skill will help him/her to get job across Globe.
5. Technical competence makes one confident & self-dependent.

(please attach separate sheet, if more space is required)

11. Approximate cost of Tools
Equipments Machinery for
Starting one batch of the course:

Rupees
Rs. 0.50 Crore

Reference Year
2016

12. Area required for practical / Workshop for one batch.

50 Sq. Meters

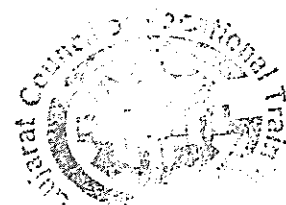
13. Minimum Power connection required

1 KW

14.1 No of items in Standard list of Simulator Module

9

14.1.1. Page NO from 5 to 5.





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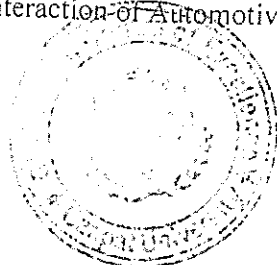


***** FOR OFFICIAL USE *****

Approved by GCVT in Governing Body meeting on :

Syllabus implemented w.e.f. admission session :

Revision History :
1. Revision No..... Revision Date.
2. Revision No..... Revision Date.
3. Revision No..... Revision Date.





Standard List of Simulator Module
For Trade of Web based Interaction of Automotive Program

Sr. No.	Description of Item with detailed specifications	Item type i.e. Machinery / Equipment OR Shop Outfit OR Trainee Toolkit	Quantity Required per one Batch of Students	Quantity Required per one Batch of Students for Instructor	Total Quantity Required (Total of previous two columns)
1.	Anti-lock braking Systems (ABS) in motor vehicles	Simulator Module	1 Nos.		1 Nos.
2.	Basic principles of Gasoline Injection	Simulator Module	1 Nos.		1 Nos.
3.	Basic principles of Diesel Injection	Simulator Module	1 Nos.		1 Nos.
4.	Basic principles of Motor vehicle Electrics	Simulator Module	1 Nos.		1 Nos.
5.	Basic principles of Motor vehicle Electrics (BATTERY)	Simulator Module	1 Nos.		1 Nos.
6.	Basic principles of Motor vehicle Electrics (STARTER)	Simulator Module	1 Nos.		1 Nos.
7.	Basic principles of Motor vehicle Electrics (GENERATOR)	Simulator Module	1 Nos.		1 Nos.
8.	Basic principles of Motor vehicle Electrics (IGNITION SYSTEMS)	Simulator Module	1 Nos.		1 Nos.
9.	Measurement & testing of Sensors in Motor vehicles	Simulator Module	1 Nos.		1 Nos.





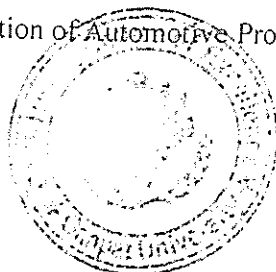
GUJARAT COUNCIL OF VOCATIONAL TRAINING
GANDHINAGAR

Name of Syllabus: Web based Interaction of Automotive Program.

Sector: Automation Sector

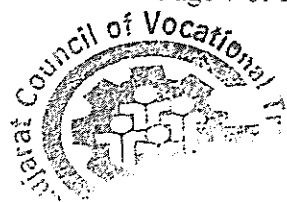
Terminal Competency: On successful completion of training one should be able to Design a system Trouble shoot the system in Automation.

Sr. No.	PRACTICAL	THEORY
1.	<p>Anti-lock braking systems (ABS) in motor vehicles Simulator Module ▶ Basic principles of physics relating to braking force and slippage ▶ Function and system design of anti-lock braking system in motor vehicles ▶ System design and function of hydro units ▶ Characteristics of sensors ▶ Change of brake fluid, characteristics ▶ Testing of the whole system with various test systems with self-diagnoses ▶ Knowledge test Learning Outcome : The participants (apprentices, car mechanics, car electricians, automotive Mechatronics) learn basic principles of physics relating to braking force and slippage. Furthermore they get to know various anti-lock braking systems and their control concepts and learn how to test these systems</p>	<p>Anti-lock braking systems (ABS) in motor vehicles Content ▶ Basic principles of physics relating to braking force and slippage ▶ Function and system design of anti-lock braking system in motor vehicles ▶ System design and function of hydro units ▶ Characteristics of sensors ▶ Change of brake fluid, characteristics ▶ Testing of the whole system with various test systems with self-diagnoses ▶ Knowledge test Learning Outcome : The participants (apprentices, car mechanics, car electricians, automotive Mechatronics) learn basic principles of physics relating to braking force and slippage. Furthermore they get to know various anti-lock braking systems and their control concepts and learn how to test these systems</p>
2.	<p>Simulator Module : Basic Principles of Gasoline Injection</p>	<p>Basic Principles of Gasoline Injection Content : ▶ Various types of gasoline</p>



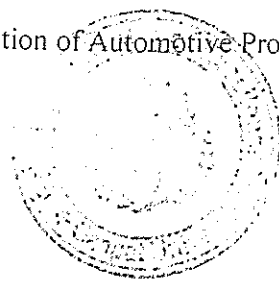


	<p>Content : ▶ Various types of gasoline injection systems ▶ Functions and system design of gasoline injection systems in motor vehicles ▶ System design and function of the sensors ▶ System design, function and testing of exhaust gas treatment system ▶ Testing of the hydraulic system: Flow rate etc. ▶ Testing of the entire system in motor vehicles using various types of test devices. ▶ Knowledge test Learning Outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) get to know the various types of gasoline injection systems and their subsystems as well as their functions. Furthermore, they learn how to test them in the entire system.</p>
<p>3. Simulator Module : Basic Principles of Diesel Injection Content : ▶ Various types of Diesel injection systems ▶ Functions and system design of Diesel injection systems in motor vehicles ▶ System design and function of distributor injection pumps ▶ Removal and installation of injection pumps and nozzle holders with two springs ▶ Practical tips from the workshop ▶ EDC system overview, boost pressure control, exhaust gas recirculation (EGR) ▶ Common rail storage injection system ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) get to know the basic principles of combustion processes and of the Diesel engine. Furthermore, they learn about the system design and working principle of distributor injection pumps and of the common rail injection system.</p>	<p>injection systems ▶ Functions and system design of gasoline injection systems in motor vehicles ▶ System design and function of the sensors ▶ System design, function and testing of exhaust gas treatment system ▶ Testing of the hydraulic system: Flow rate etc. ▶ Testing of the entire system in motor vehicles using various types of test devices. ▶ Knowledge test Learning Outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) get to know the various types of gasoline injection systems and their subsystems as well as their functions. Furthermore, they learn how to test them in the entire system.</p> <p>Basic Principles of Diesel Injection Content : ▶ Various types of Diesel injection systems ▶ Functions and system design of Diesel injection systems in motor vehicles ▶ System design and function of distributor injection pumps ▶ Removal and installation of injection pumps and nozzle holders with two springs ▶ Practical tips from the workshop ▶ EDC system overview, boost pressure control, exhaust gas recirculation (EGR) ▶ Common rail storage injection system ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) get to know the basic principles of combustion processes and of the Diesel engine. Furthermore, they learn about the system design and working principle of distributor injection pumps and of the common rail injection system.</p>
<p>4. Simulator Module : Basic Principles</p>	<p>Basic Principles of Motor Vehicle Electric</p>



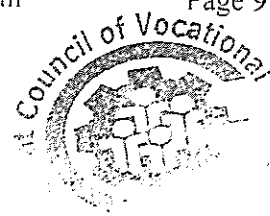
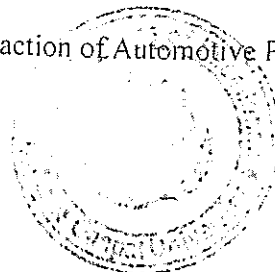


	<p>of Motor Vehicle Electric Content : ▶ Basic introduction to Ohm's law ▶ Electrical resistance, electrical wiring ▶ Measurement of electrical quantities ▶ Series and parallel circuits ▶ Circuit symbols ▶ Basic principles of electronics (diodes, transistors ...) ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) will learn how to deal with measurement technology safely and how to calculate the right cable diameters for car electronics.</p>	<p>Content : ▶ Basic introduction to Ohm's law ▶ Electrical resistance, electrical wiring ▶ Measurement of electrical quantities ▶ Series and parallel circuits ▶ Circuit symbols ▶ Basic principles of electronics (diodes, transistors ...) ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) will learn how to deal with measurement technology safely and how to calculate the right cable diameters for car electronics.</p>
5.	<p>Simulator Module : Basic Principles of Motor Vehicle Electric – BATTERY Content : ▶ Basic Principles of battery, safety instructions ▶ Functions and operating principles of the starter battery ▶ Battery technologies, wet cell battery, AGM battery, gel Battery ▶ Battery load, battery maintenance ▶ Battery faults, battery testing, battery charging ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) learn to handle modern battery technology safely</p>	<p>Basic Principles of Motor Vehicle Electric – BATTERY Content : ▶ Basic Principles of battery, safety instructions ▶ Functions and operating principles of the starter battery ▶ Battery technologies, wet cell battery, AGM battery, gel Battery ▶ Battery load, battery maintenance ▶ Battery faults, battery testing, battery charging ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) learn to handle modern battery technology safely</p>
6.	<p>Simulator Module : Basic Principles of Motor Vehicle Electric – STARTER MOTOR Content: ▶ Various types of starter motors ▶ Functions and operating principles of starter motors ▶ System design and function of the individual starter Motors ▶ Function of the freewheel mechanism ▶ Function test of the entire starter system in motor Vehicles ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics)</p>	<p>Basic Principles of Motor Vehicle Electric – STARTER MOTOR Content: ▶ Various types of starter motors ▶ Functions and operating principles of starter motors ▶ System design and function of the individual starter Motors ▶ Function of the freewheel mechanism ▶ Function test of the entire starter system in motor Vehicles ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) get to know the operating principle, the system design and the function of starter motors.</p>





<p>get to know the operating principle, the system design and the function of starter motors. Furthermore, they learn how to test them.</p>	<p>Furthermore, they learn how to test them. <small>कोशलम् वरुण</small></p>
<p>7. Simulator Module : Basic Principles of Motor Vehicle Electric – GENERATOR Content: ▶ Various types of generators ▶ System design, functions and operating principles of generators ▶ Function of the voltage regulation and rectification ▶ Function test of the entire generator set in motor vehicles ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, and automotive mechatronics) get to know the system design, function and operating principle of generators. Furthermore, the participants get to know the voltage regulation and the possibilities of testing..</p>	<p>Basic Principles of Motor Vehicle Electric – GENERATOR Content: ▶ Various types of generators ▶ System design, functions and operating principles of generators ▶ Function of the voltage regulation and rectification ▶ Function test of the entire generator set in motor vehicles ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, and automotive mechatronics) get to know the system design, function and operating principle of generators. Furthermore, the participants get to know the voltage regulation and the possibilities of testing..</p>
<p>Simulator Module : Basic Principles of Motor Vehicle Electric – IGNITION SYSTEMS Content : ▶ Various types of ignition systems ▶ Functions and operating principles of ignition systems ▶ System design, function and testing of encoder systems ▶ Different types of ignition coils ▶ Fully electronic ignition systems ▶ Testing of the individual ignition systems in motor Vehicles ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) get to know the system design and function of electronic ignition systems, different encoder systems, ignition coils and fully electronic ignition systems. Furthermore, the participants learn how to test the respective systems.</p>	<p>Basic Principles of Motor Vehicle Electric – IGNITION SYSTEMS Content : ▶ Various types of ignition systems ▶ Functions and operating principles of ignition systems ▶ System design, function and testing of encoder systems ▶ Different types of ignition coils ▶ Fully electronic ignition systems ▶ Testing of the individual ignition systems in motor Vehicles ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) get to know the system design and function of electronic ignition systems, different encoder systems, ignition coils and fully electronic ignition systems. Furthermore, the participants learn how to test the respective systems.</p>
<p>Measurement and testing of sensors in motor vehicles</p>	<p>Measurement and testing of sensors in motor vehicles</p>





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<p>Simulator Module : Various types of sensors ▶ Functions and operating principles of sensors ▶ System design, function and testing of sensors ▶ Inductive sensors, hall sensors ▶ Temperature sensors, air mass meters, yaw sensors .Magneto-resistive sensors, piezo sensors ▶ Co-operation of the sensors in the entire system ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) get to know the system design and function of various sensors in motor vehicles and learn how to test them</p>	<p>Content : ▶ Various types of sensors ▶ Functions and operating principles of sensors ▶ System design, function and testing of sensors ▶ Inductive sensors, hall sensors ▶ Temperature sensors, air mass meters, yaw sensors .Magneto-resistive sensors, piezo sensors ▶ Co-operation of the sensors in the entire system ▶ Knowledge test Learning outcome: The participants (apprentices, car mechanics, car electricians, automotive mechatronics) get to know the system design and function of various sensors in motor vehicles and learn how to test them</p>
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Signature:

Mr. Chetan Rajdev

Nitin Sapre

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C.K.Chauhan

