



**Gujarat Council of Vocational Training
Gandhinagar**



1. Name of Course:

**Certified Technician of Construction
Equipment**

N.C.O. No. for Skills Covered:
(Please refer National Classification of
Occupations -2004 available
on www.dget.nic.in)

2. Engineering OR Non-engineering: **Engineering**

3. No. of students per batch: **20 Nos / Batch**

4. Duration in Hours. : **420 Hrs**

5. Duration in Month: **2.5 months @ 42 hours/Week**

6. Examination Scheme:

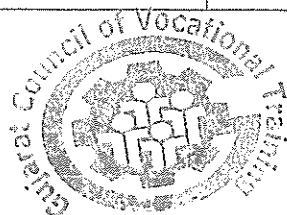
No.	Name of Subject	Teaching Hours during full course.	Maximum Marks. (Excluding Sessional)	Minimum Marks required for Passing (Excluding Sessional).	Sessional Marks if any.
Subject-1	Theory	60 Hrs	100	40	NA
Subject-2	Practical	360Hrs.	300	180	NA
Subject-3					
Subject-4					
Subject-5					

7. Entry qualification for Trainee:

Minimum entry qualification (Essential):	Minimum 8 th Standard Passed
Desirable:	10 th Standard Passed

8. Minimum qualification for Trainer:

Minimum qualification (Essential):	Diploma in Mechanical Engineering
Desirable:	





9. Syllabus Committee Member:

Sr. No.	Name	Organization	Designation	Technical Qualification	Experience in Years	Signature
1.	Mr. Ramji Patel	Apollo Infratech Pvt. Ltd.	DGM(Works)	Diploma Mech.	15	
2.	Mr. Pradip Patel	Apollo Infratech Pvt. Ltd.	Manager - Design	BE (Mechanical)	14	
3.	Mr. Jigar Patel	Apollo Infratech Pvt. Ltd.	Manager - HR	LLB	10	
4.	Mr. A. R. Panchal	ITI, Mehsana	Principal	Diploma Mech.	21	
5.	Mr. T. K. Parmar	ITI, Mehsana.	AAA(Junior)	Diploma Mech.	20	

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...
Successful candidate would be able to ...

1. Can understand the importance of safety during routine work.
2. Basic Knowledge and use of Measuring Instruments.
3. Can perform of mechanical fitting.
4. Basic Knowledge of Hydraulic system and components.
5. Can perform Hydraulic Assembly.
6. Can perform different types of welding.
7. Basic Knowledge of Metallurgy.
8. Basic Knowledge of different types of welding machines and their operations.





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

Rupees
Rs. 17, 50,000/-

Reference Year
2015-2016

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

4000 Sq. Meter

13. Minimum Power connection required

5 K.W.

14.1 No of items in Standard list of Equipments

51 Nos.

14.1.1. Page NO 04

14.2 No of items in Standard list of Shop outfit:

137 Nos.

14.3 No of items in Standard list of Trainee Tool-Kit:

304 Nos.

14.3.1. Page NO 06

14.4 No of items in Standard list of consumables:

As Per Attached Sheet

14.4.1. Page NO 07

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

Approved by GCVT in Governing Body meeting on

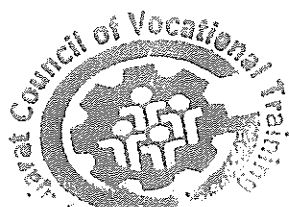
: 30-12-2015

Syllabus implemented w.e.f. admission session

: next session

Revision History :

1. Revision No..... Revision Date.
2. Revision No..... Revision Date.
3. Revision No..... Revision Date.



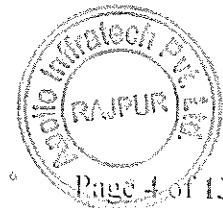
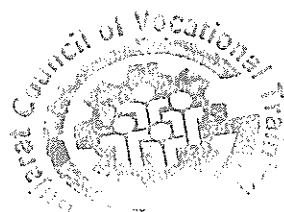


Standard List of Equipment

For Trade of - Certified Technician – Construction Equipment

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	MIG Welding Machine	Equipment	04	01	05
2	CO2 Cylinder	Equipment	04	01	05
3	Gas cutting Nozzle	Equipment	04	01	05
4	O2 Cylinder	Equipment	04	01	05
5	LPG Cylinder	Equipment	04	01	05
6	Grinding machine.	Equipment	04	-	04
7	Material handling cart	Equipment	04	-	04
8	Hydraulic Power Pack with hydraulic oil	Equipment	02	-	02
9	Test Bench for Hydraulic system	Equipment	02	-	02
10	Hydraulic hoses and fittings	Equipment	02	-	02
11	Hydraulic cylinder.	Equipment	02	-	02
12	Batch grinder	Equipment	02	-	02
13	Torque wrench	Equipment	04	-	04
14	Pneumatic wrench	Equipment	04	-	04

Note : We will provide practical training in group of students. Each group will be split in 5 to 6 students.





Standard List of Shop Outfit

For Trade of - Certified Technician – Construction Equipment

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	Safety Helmet	Shop Outfit	20	03	23
2	Safety Goggles	Shop Outfit	20	03	23
3	Ear plug	Shop Outfit	20	03	23
4	Safety Shoes	Shop Outfit	20	03	23
5	Apron for welder	Shop Outfit	20	03	23
6	Welding glass	Shop Outfit	10	01	11
7	Grinding goggles	Shop Outfit	10	01	11

Note : We will provide practical training in group of students. Each group will be split in 5 to 6 students.





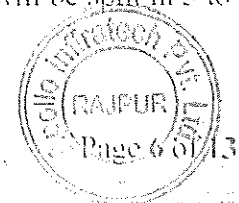
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Standard List of Tools



For Trade of - Certified Technician – Construction Equipment

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	Grinding Disc.	Tool	10	02	12
2	Measure taps.	Tool	10	02	12
3	Right angle	Tool	10	02	12
4	Level indicators	Tool	05	01	06
5	Plumb	Tool	10	02	12
6	Fix Spanner Sets	Tool	10	02	12
7	Ring Spanner Sets	Tool	10	02	12
8	Hammer 500 grams	Tool	10	02	12
9	Plier	Tool	10	02	12
10	Bench wise	Tool	04	-	04
11	Drill bit	Tool	10	02	12
12	Allen key set	Tool	10	02	12
13	Hack saw with blade	Tool	10	02	12
14	Round and flat files	Tool	10	02	12
15	Tap set and wrench	Tool	10	02	12
16	Hand drill machine	Tool	05	-	05
17	Screw Drivers	Tool	10	02	12
18	Teflon tap	Tool	50	05	55
19	Loctite	Tool	50	05	55
20	External threads die and wrench	Tool	05	-	05
21	Multi meter	Tool	02	-	02
22	Grease gun	Tool	04	-	04

Note : We will provide practical training in group of students. Each group will be split in 5 to 6 students.



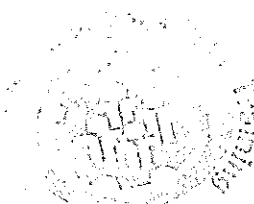


Standard List of Consumables

For Trade of - Certified Technician – Construction Equipment

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	Grease	Consumable	20 Kg	-	20 Kg
2	Hydraulic oil	Consumable	100 Ltr	-	100 Ltr
3	Cutting oil	Consumable	10 Ltr	-	10 Ltr
4	MIG wire	Consumable	100 Kg	20 Kg	120 Kg
5	Anti-spatter spray	Consumable	30 Tin	5 Tin.	35 Tin
6	Raw materials for practical (plate, pipes, sections, fasteners)	Consumable	200 Kg	50 Kg	250 Kg

Note : These are consumables for the machine and those have long life so those are not required for particular for any instructor.





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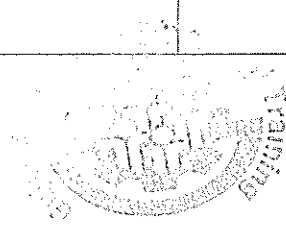
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GANDHINAGAR

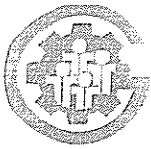
Name of Syllabus: Certified Technician – Construction Equipment

Sector: Construction

Terminal Competency:

Week No	Theory	No of Hrs	Practical	No of Hrs
1	<ol style="list-style-type: none">1. Brief introduction about the course.2. Safety Precaution & first Aid.3. Use, care and maintenance of tools and equipment.4. Knowledge and use of Measuring Instruments5. Marking and cutting	6 Hours	<ol style="list-style-type: none">1. Practice health and safety Familiarize.2. Select, use, maintain & store- tools, consumables.3. Personal safety while practical training.4. Understanding of welding machine and function of each component5. Use of pressure gauges.6. Identify various electrical equipment. I.e. junction box, ground connections, switches, sensors etc.7. Measuring units.8. Practical of measuring instruments for different shape and sizes of work piece.9. Calibration of measuring instruments.10. Practical use of marking tools.	36 Hours
2	<ol style="list-style-type: none">1. Bench vice and vice clamps2. Hacksaw frame and blade3. Elements of file4. Tap and tap wrench.	6 Hours	<ol style="list-style-type: none">1. Practical demonstration for types of vice.2. Practical on standard use and mounting of vice for different kind of machines.3. Safety precaution during hacksaw cutting.4. Practical for types of hacksaw frame and blades with marking and cutting practices.5. Practical use of different types of file and their	36 Hours



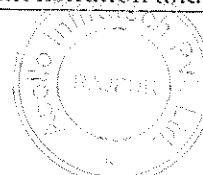
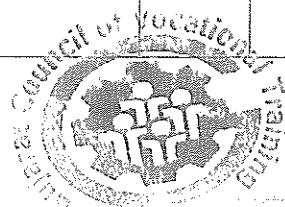


			<p>applications according to assembly and fitting.</p> <p>6. Practical of drilling and tapping with use of different types of taps and drill bits.</p> <p>7. Practical to remove broken taps and drill bits.</p>	
3	<ol style="list-style-type: none"> Types of bolts and studs Types of nut and washers. Application of bolt, stud, nut and washer. Types of Pipes and tubes & their use Types of Pipe and tubes Fittings according to applications Types of Plier , Spanner & Screw Drivers 	6 Hours	<ol style="list-style-type: none"> Practical to identify the bolts and studs and their applications. Practical to identify the Nut and washers and their applications. Measurement of threads and pitch. Practical use of thread and pitch gauges. Practical to identify the pipes and tubes according to those different standards and their applications. Practical use of fitting components like elbows with different degrees, coupling, union etc. Practical to make external threads on pipe and tubes. Practical on use of plier, spanners and screw driver to fit the Screw, bolts, nut, tubes and pipes. 	36 Hours
4	<ol style="list-style-type: none"> Basic knowledge of hydraulic system. Types of Hydraulic Oil & its use Our Products based on Hydraulics Other Industrial Applications Components used in our machines (Pumps, motors, valves, etc.) Application of Different Components Symbols for all the 	6 Hours	<ol style="list-style-type: none"> Practical on various hydraulic applications. Practical introduction to various types of hydraulic oils and their uses. Importance of hydraulic oil for entire system. Practical overview and demonstration of hydraulic systems used in our different products like Self loading mobile mixtures, CAP machines and Pavers. 	36 Hours



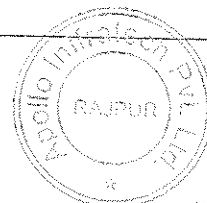
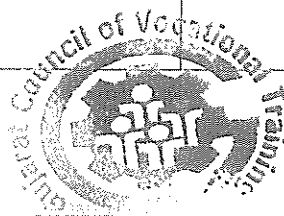


	<p>components</p> <p>8. Hydraulic circuit</p> <p>9. Types of Hydraulic System</p> <p>10. Examples of circuits</p>		<p>5. Overview of hydraulic systems used in other industrial products.</p> <p>6. Introduction of hydraulic components used in our system like, pumps, motors, valves, fittings, etc.</p> <p>7. Use and importance of every components.</p> <p>8. Introduction of symbols for various components to understand hydraulic circuit.</p> <p>9. Basics to understand hydraulic circuit.</p> <p>10. Practical demonstration of open loop and close loop hydraulic systems.</p>	
5	<p>1. Types of Connectors & Application</p> <p>2. Types of Seals</p> <p>3. Types of Hydraulic Hoses & Application</p> <p>4. Basics of Hydraulic Cylinder</p> <p>5. Types of Valves used in Self Loading Transit Mixers & its Application</p>	6 Hours	<p>1. Demonstration of various types of connectors.</p> <p>2. Practical application and importance of connectors in hydraulic circuit.</p> <p>3. Tightening procedure for various connectors.</p> <p>4. Demonstration and importance of various types of hydraulic seals.</p> <p>5. Demonstration and importance of various types of hydraulic hoses.</p> <p>6. Practical laying and fitment of hydraulic hoses as per lay out.</p> <p>7. Practical demonstration for application of hydraulic cylinder.</p> <p>8. Fitment of hydraulic cylinder with respect to stroke length.</p> <p>9. Fitment of cylinder connections (input & output).</p> <p>10. Demonstration and</p>	36 Hours



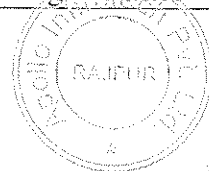
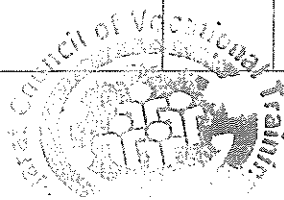


			fitment of valves used in self loading transit mixer.	
6	<ol style="list-style-type: none"> 1. Hydraulic Filters 2. Instructions for Fitting of Hoses 3. Assembly of Hydraulic Pumps & motors 4. Types of Sealants used in fitting & its application 5. Cares Should be Taken while assembling Hydraulic System 6. Importance of Cleanliness for Hydraulic Assembly 7. Testing Procedure for Hydraulic System 8. Introduction for Gauges & Application 9. Troubleshooting 10. Safety & Equipment 11. Practical View of Product regarding Hydraulic 	6 Hours	<ol style="list-style-type: none"> 1. Demonstration and importance of various types of hydraulic filters. 2. Fitment of hydraulic filters. 3. Practical fitting of hydraulic hose as per lay out. 4. Practical fitment of hydraulic pump and motor. 5. Alignment check during fitment. 6. Demonstration and importance of various types of sealants. 7. Proper application of sealants during fitment. 8. Practical training for Dos and Don'ts during assembly of hydraulic system. 9. Demonstration for importance of cleanliness during hydraulic assembly. 10. Demonstration of broken parts due to lack of cleanliness. 11. Selection and importance of pressure gauges. 12. Demonstration for testing procedure of hydraulic system. 13. Practical training for Dos and Don'ts during testing of hydraulic system. 14. Demonstration for troubleshooting of various parts during testing. 	36 Hours





7	<ol style="list-style-type: none">1. Introduction of Welding2. Types of welding3. Arc4. Power Supplies5. Processes6. Gas Welding7. Resistance8. Energy Beam Solid state	6 Hours	<ol style="list-style-type: none">1. Introduction to types of welding processes.2. Practical demonstration of basic welding process with required personal protective equipment.3. Demonstration of standard welding practices (Dos & don'ts before and after welding).4. Demonstration to check the joint fit-up before welding.5. Demonstration to set the required parameters (i.e. polarity, current, voltage, wire speed etc).6. Practice to maintain proper arc length during welding.	36 Hours
8	<ol style="list-style-type: none">1. Welding Joint Types2. Welding Defects3. Shielding Gas4. Welding Symbols5. Heat Affected Zones6. Tools	6 Hours	<ol style="list-style-type: none">1. Demonstration of different types of welding joints, welding positions(Flat, Horizontal, vertical, overhead), Joint parameters(root gap, root face, root angle, etc)2. Demonstration of different welding defects. Cause and corrective actions for the welding defects.3. Types of shielding gas and affect of shielding gas on weld joints.4. Understanding and importance of welding symbols.5. Understanding of heat affected zone. Reason for occurrence of heat affected zone.6. Practical demonstration of tools required during welding and after	36 Hours





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			welding.	
9	<ol style="list-style-type: none"> 1. Metallurgy 2. Unusual Condition 3. Other types of welding (Glass, plastic welding) 4. Safety and safety equipment 5. Welding Hand Screen 6. Welding Helmet Screen 7. Chipping Goggles 8. Apron 9. Hand Gloves 	6 Hours	<ol style="list-style-type: none"> 1. Understanding for metallurgy of parent metal. This material study is required to select the filler metal. 2. Understanding of unusual conditions during welding and how to avoid these conditions. 3. Importance of safety and safety equipment like welding hand screen, welding helmet screen, chipping goggle, apron, hand gloves, etc. 	36 Hours
10	Theory Revision for all four subjects and examination	6 Hours	Practical Revision for all four subjects and examination	36 Hours
TOTAL HOURS		60 hrs		360 hrs

Signature:

Name

Sign

1. Mr. Ramji Patel - DGM Workds
2. Mr. Pradip Patel – Manager Design
3. Mr. Jigar Patel – Manager HR
4. Mr. A.R.Panchal – Principal (Mehsana)
5. Mr. T.K. Parmar – AAA(Junior)

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Patel

Patel

Patel

