



Gujarat Council of Vocational Training Gandhinagar



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1. Name of Course:

Chemical Plant Operator (Process Attendant)

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: Non - Engineering

3. No. of students per batch: 25

4. Duration in Hours. : 616 Hours : 16 Weeks : 4 Months

5. Duration in Month: 4 month @ 38.5 hours/Week.

5. Examination Scheme:

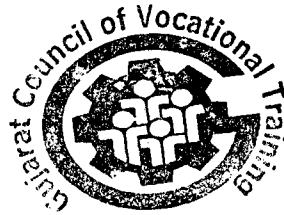
No.	Name of Subject	Teaching Hours during full course.	Maximum Marks. (Excluding Sessional)	Minimum Marks required for Passing (Excluding Sessional).	Sessional Marks if any.
Subject-1	Theory (176 hours) & Soft Skills (88 hours)	264	100	40	-
Subject-2	Practical	352	300 (150)	180 (90)	-
Subject-3					
Subject-4					
Subject-5					

7. Entry qualification for Trainee:

Minimum entry qualification (Essential):	10 th Pass
Desirable:	10 th Pass

3. Minimum qualification for Trainer:

Minimum qualification (Essential):	Diploma (Chemical)
Desirable:	Diploma (Chemical)





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2. Syllabus Committee Member:

Sr. No.	Name	Organization	Designation	Technical Qualification	Experience in Years	Signature
1.	Mr. Rajesh Chadha	GIZ-IS, India Branch	Technical Expert	B.E. - I.C.	20	
2.	Lt.col.A.Sekar	Atul Institute Of Vocational Excellence	Director	MSC (Chemistry) MA(English)	30 Years	
3	Dr .R Vishno	Atul Ltd	Counsltant	Phd (Chemical Engineering)	50 Years	
4	MR. SHAILESH B. PATEL	ITI PARDI	SI-COE	DIPLOMA CHEMICAL ENGG.	21 YEARS	
5.	Dr. Bhavin J Modi	Atul Ltd COLORS.	Sr. Mgr	Phd (org.chem)	15 years	
6.	MR. R.V. Kapdi	ITI PARDI	PRINCIPAL	Diploma in Chemi Cal. Engg.	21 yrs.	





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. To develop knowledge to handle Chemical operations with safety and ability to act in case of plant emergency , general awareness of major equipment, chemicals etc
2. To be able to handle operations of various types of pumps and valves---- reciprocating , centrifugal, gear pump, hydraulic pumps gate, globe , ball , stop cock and plug valve. ---role of **Chemical process operator**

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





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

Rupees
5,09,283

Reference Year
2014

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

96 Sq. Meter

13. Minimum Power connection required

..... K.W.

14.1 No of items in Standard list of Machinery:

Attached

14.1.1. Page NO from ___ to ___.

14.2 No of items in Standard list of Shop outfit:

Attached

14.2.1. Page NO from ___ to ___.

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

Attached

14.3.1. Page NO from ___ to ___.

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

Approved by GCVT in Governing Body meeting on

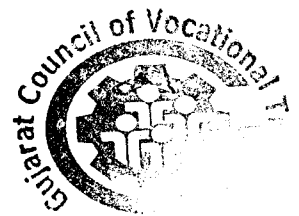
: 12-12-2014

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.



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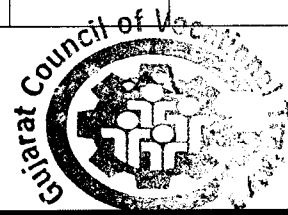


Standard List of Machinery - Equipment / Shop-outfit / or Trainee Toolkit
For Trade of **Chemical Plant Operator (Process Attendant)**

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.	Fire extinguisher (soda acid)	Equipment	1 no.	-	1 no.
2.	Chemical foam extinguisher	Equipment	1 no.	-	1 no.
3.	Mechanical foam	Equipment	1 no.	-	1 no.
4.	Dry chemical powder	Equipment	1 no.	-	1 no.
5.	Carbon-dioxide extinguisher	Equipment	1 no.	-	1 no.
6.	Smoke detector	Equipment	1 no.	-	1 no.
7.	Flame detector	Equipment	1 no.	-	1 no.
8.	Heat detector	Equipment	1 no.	-	1 no.
9.	Materials/chemical safety	Equipment	20 sheets.	-	20 sheets.
10.	Flow sheets of manufacturing aids	Equipment	CDs.	-	CDs.
11.	Personal protective boot, helmet, gloves, aprons,	Equipment	20 kit.	-	20 kit.
12.	Tool kit.	Tool kit.	1 no.	-	1 no.

List of Equipment for Specialisation Module on Chemical Process Operator (process attendant) in a Chemical Plant

1	Venturimeter test rig	. Equipment	1 no.	-	1 no.
2	Orifice meter test rig	Equipment	1 no.	-	1 no.
3	Rotameter test rig	Equipment	1 no.	-	1 no.
4	Gas flow meter test rig	Equipment	1 no.	-	1 no.
5	GATE valve 4" Non-rising stem, Rising stem	Equipment	1 no. each	-	1 no. each

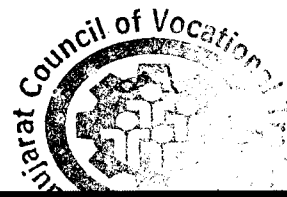




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6	Globe valve 4"	Equipment	1 no.	-	1 no.
7	Ball valve 4"	Equipment	1 no.	-	1 no.
8	Needle valve 4"	Equipment	1 no.	-	1 no.
9	Plug valve 4"	Equipment	1 no.	-	1 no.
10	Butterfly valve 4"	Equipment	1 no.	-	1 no.
11	Diaphragm valve 4"	Equipment	1 no.	-	1 no.
12	Check valve (NRV) 4"	Equipment	1 no.	-	1 no.
13	Ball valve (NRV) 4"	Equipment	1 no.	-	1 no.
14	Lift check valve (NRV) 4"	Equipment	1 no.	-	1 no.
15	Tool kit	Tool kit	1 no.	-	1 no.
16	Pipe vice 4"	Equipment	1 no.	-	1 no.
17	Pipe wrench 12"118"	Equipment	1no.	-	1no.
18	Pipe die set	Equipment	1 set	-	1 set
				-	
20	venturi/orifice/rota test rig	Equipment	1no.	-	1no.
21	Pitot tube	Equipment	1no.	-	1no.
	pumps test rig			-	
22	Centrifugal	Equipment	1no.	-	1no.
23	Reciprocating	Equipment	1no.	-	1no.
24	Gear	Equipment	1no.	-	1no.
25	Compressor	Equipment	1no.	-	1no.
26	Cross section model of Valves 2 inch Mild Steel			-	
27	Globe	Equipment	1no.	-	1no.
28	Gate	Equipment	1no.	-	1no.
29	Needle	Equipment	1no.	-	1no.



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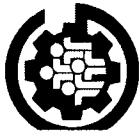


					કોશલમ્ બલમ
30	Check	Equipment	1no.	-	1no.
31	Plug	Equipment	1no.	-	1no.
32	Controlvalve/on/off	Equipment	1no.	-	1no.
33	butterfly	Equipment	1no.	-	1no.
34	Diaphragm	Equipment	1no.	-	1no.
	Cross section model for 2inch pipe size pumps Mild Steel				
35	Centrifugal	Equipment	1no.	-	1no.
36	reciprocating	Equipment	1no.	-	1no.
37	gear	Equipment	1no.	-	1no.
38	lobe	Equipment	1no.	-	1no.
39	mono	Equipment	1no.	-	1no.
40	Vacuum	Equipment	1no.	-	1no.
	glass model 5 litter capacity (Demonstration)				
41	distillation reflux column	Equipment	1no.	-	1no.
42	evaporator	Equipment	1no.	-	1no.
43	crystallization	Equipment	1no.	-	1no.
44	filtration	Equipment	1no.	-	1no.
45	heat exchanger	Equipment	1no.	-	1no.
46	condenser	Equipment	1no.	-	1no.

(As many sheets as required should be used to accommodate all items)



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Name of Syllabus: **Chemical Plant Operator (Process Attendant)**

Sector: **Chemical**

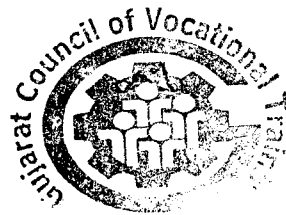
Terminal Competency:

Unit #	Module (Chemical plant safety)	Contents	Practical to be carried out	No. of Weeks
1	Introduction to Chemical plant	<ul style="list-style-type: none">• Role of Chemical Plant operator	<ul style="list-style-type: none">• Exposure to Chemical equipment , identification of various units, equipments etc	1
2	Introduction to Good Housekeeping	<ul style="list-style-type: none">• The importance of good house keeping• How personal safety is to be maintained	<ul style="list-style-type: none">• Storage of hazardous chemicals• Use of protective equipment like aprons, gloves, helmets, mask, gumboots etc	
3	Importance of safety in chemical plants	<ul style="list-style-type: none">• Precautions to be observed while working in a Chemical plant• Causes and prevention of accidents• First aid	<ul style="list-style-type: none">• Use of proper equipment and clothing• Demonstration of First aid techniques	1 / 2
4	Fire Prevention techniques	<ul style="list-style-type: none">• Role of detectors for Smoke, heat, flame alarms	<ul style="list-style-type: none">• Study how Fire prevention system is installed and its working• Learn about emergency responses	1 / 2
5	Fire Fighting techniques	<ul style="list-style-type: none">• Study types of Fire extinguisher• Choice of extinguisher in Fire fighting	<ul style="list-style-type: none">• Learn how to use various types of extinguishers	1 / 2
6	Material Handling	<ul style="list-style-type: none">• Properties of Hazardous Chemicals• Safe handling procedures	<ul style="list-style-type: none">• How to identify various chemicals• Material safety data sheets	
7	General awareness of a Chemical plant	<ul style="list-style-type: none">• General introduction of Chemical Plant, raw	<ul style="list-style-type: none">• Study through audio visual aids of Chemical plant processes	1

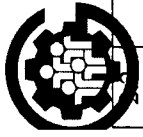


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		<ul style="list-style-type: none">materials, intermediates and final products.Introduction of different pumps, pipes, valvesvessels, heat exchangers, dryers, evaporator, filtration unit etc. in chemical plant.Familiarization with plant utilities and service lines such as – steam, water, vacuum, compressed air, fuel line, refrigeration and air conditioning	<ul style="list-style-type: none">Study of process flow sheets	
8	Measurement concepts of key parameters	<ul style="list-style-type: none">General Awareness about length, width, height, area, volume, pressure, flow, temperature, level, pH density, viscosity, current, specific gravity	<ul style="list-style-type: none">To assess quality of raw material and product by color, odor, pH, density and viscosity	1 / 2
TEST <ul style="list-style-type: none">Separate theory and practical tests to be conducted.Practical test must cover all the operations broadly.Test to be performed by each individual and evaluated and defects need to be identified and explained in the class.				
Unit #	Module (process attendant)	Contents	Practical to be carried out	No. of Weeks
2.1	Understanding Fluid properties	<ul style="list-style-type: none">Fundamentals of molecular chemistryBasic properties of fluids, density, refractive index and viscosity.Fundamentals of flow of fluids, flow pattern laminar and turbulent flow and flow measurements.	<ul style="list-style-type: none">Construction, working, operations and trouble shooting of flow measuring devices: Venturimeter, Orifice meter, Pitot tube, Rotameter, Quantity meter.Operation and flow measurement by gas flow meter:, wet gas meter, -dry diaphragm meter	2



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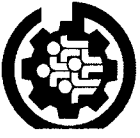


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working principles, operation and trouble shooting of fluid transporting devices	<ul style="list-style-type: none">Centrifugal pump, Positive displacement pump, Reciprocating Rotary, Diaphragm.Vacuum pumps – water ring and oil ring type.	<ul style="list-style-type: none">Operation and head v/s capacity curve for: centrifugal pump, Reciprocating pump, Gear pumpOperation of Diaphragm pump for slurry or corrosive liquid.Operation of given vacuum pump.	3
2.3 Operations of valves	An introduction about valves:- Types, construction, functions and uses.	<ul style="list-style-type: none">Operations of gate, globe, ball, stop cock and plug valve.	2
2.4 Pipes and pipe fittings	Introduction to types of pipe joints, threads, washers, flanges, gas kits etc	<ul style="list-style-type: none">Practical on pipe cuttingPipe threading, bending, jointing, locking	1
On the job training			2 weeks
Clarification of doubts, problem solving on feedback received from on the job training			2 weeks
TEST <ul style="list-style-type: none">Separate theory and practical tests to be conducted.Practical test must cover all the operations broadly.Test to be performed by each individual and evaluated and defects need to be identified and explained in the class.			12 weeks total



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कोशलम् बलम्

Soft Skills

SR NO	TOPIC	Weeks
1	Personality Development Introduction (Speaking about yourself) Strengths, Weaknesses & Hobbies Role model (Idol) Communication Skills	1 Week
2	Nouns, Types of Nouns & Rules of forming Plural Nouns Rules of forming Plural Nouns Verbs Forms of Verbs Team Work	1 Week
3	Present Tense Verbs Future Tense Skill to develop Personal Relations	1 Week
4	The Sentence Negative Sentences Self Confidence	1 Week
5	Good manner words in English Exclamation words in English Frequently used phrases Team Spirit	1 Week
6	Words often confused Conversation Skills - from books & newspaper articles	1 Week
7	Group Discussion	1 Week



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कौशलम् बलम्

	Speaking about relevant topics in daily life	
	Application for leave	
	Application for job	
	Invitation	
	Interview	
8	Conversational Skills - on company visits practical training etc. Speaking in Hindi	1 Week
9	Interview Questions Body Language Writing Short Stories Frame Sentences	1 Week
10	Positive Attitude Imaginative Sentences Names of different items	1 Week
11	Time Management	1 Week
12	Health and Hygiene	1 Week
13	Leadership	1 Week
14	Dressing (Hygiene and Safety)	1 Week
15	Developing skills in life	1 Week
16	Key to live a successful life	1 Week

