



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

COMPETENCY BASED CURRICULUM

PLASTIC PROCESSING OPERATOR

(Duration: One Year)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4



SECTOR – CHEMICAL

PLASTIC PROCESSING OPERATOR

(Engineering Trade)

(Revised in 2018)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL - 4

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Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

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CONTENTS

S No.	Topics	Page No.
1.	Course Information	1
2.	Training System	2-5
3.	Job Role	6-7
4.	General Information	8-9
5.	NSQF Level Compliance	10
6.	Learning/ Assessable Outcome	11-12
7.	Learning Outcome with Assessment Criteria	13-22
8.	Trade Syllabus	23-34
9.	Syllabus - Core Skill	
	9.1 Core Skill – Workshop Calculation Science & Engineering Drawing	35-38
	9.2 Core Skill – Employability Skill	39-43
10.	Annexure I	
	List of Trade Tools & Equipment	44-48
	List of Tools & Equipment for Employability Skill	48
11.	Annexure II - Format for Internal Assessment	49

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1. COURSE INFORMATION

During the one-year duration of Plastic Processing Operator trade, a candidate is trained on Professional Skill, Professional Knowledge, Engineering Drawing, Workshop Calculation & Science and Employability Skill. In addition to this, a candidate is entrusted to undertake project work and extracurricular activities to build up confidence. The broad components covered related to the trade are categorized in four semesters each of six months duration. The semester wise course coverage is categorized as below:

1st Semester - In this semester the trainee learns about safety and environment, use of fire extinguishers, artificial respiratory resuscitation to begin with. He gets the idea of trade tools & its standardization, Familiarize with basic fitting, basic of electricity, identification of plastics. Skilling practice of injection moulding and compression moulding. The process of FRP and also construction of hydraulic circuits. They will also skilled with different project works.

2nd Semester - In this semester the trainee learns about process of Blow moulding, extrusion and thermoforming. They will skilled with rotational moulding process. They will also perform of construction of Pneumatic circuits. They will also skilled in fabrication of plastic and predrying process. They will also skilled with different project works.

2.1 GENERAL

The Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of Labour market. The vocational training programmes are running under aegis of National Council of Vocational Training (NCVT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programmes under NCVT for propagating vocational training.

The Plastic Processing Operator trade under CTS is one of the popular courses delivered nationwide through network of ITIs. The course is of one-year (02 semester) duration. It mainly consists of Domain area and Core area. In the Domain area (Trade Theory & Practical) impart professional skills and knowledge, while Core area (Workshop Calculation & science, Engineering Drawing and Employability Skills) impart requisite core skill, knowledge and life skills. After passing out the training program, the trainee is awarded National Trade Certificate (NTC) by NCVT which is recognized worldwide.

Trainee broadly needs to demonstrate that they are able to:

- Read & interpret technical parameters/documentation, plan and organize work processes, identify necessary materials and tools;
- Perform tasks with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional knowledge, core skills & employability skills while performing the job, and repair & maintenance work.
- Check the job with circuit diagrams/components as per drawing for functioning, diagnose and rectify faults in the components/module.
- Document the technical parameters in tabulation sheet related to the task undertaken.

2.2 CAREER PROGRESSION PATHWAYS:

- Can join Apprenticeship programs in different types of industries leading to a National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming an instructor in ITIs.

2.3 COURSE STRUCTURE:

Table below depicts the distribution of training hours across various course elements during a period of one-year (02 semesters): -

S No.	Course Element	Notional Training Hours
1	Professional Skill (Trade Practical)	1050
2	Professional Knowledge (Trade Theory)	252
3	Workshop Calculation & Science	84
4	Engineering Drawing	126
5	Employability Skills	110
6	Library & Extracurricular Activities	58
7	Project Work	160
8	Revision & Examination	240
	Total	2080

2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of the course and at the end of the training program as notified by the Government of India (GoI) from time to time. The employability skills will be tested in the first two semesters itself.

a) The **Internal Assessment** 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 an individual trainee portfolio as detailed in assessment guideline. The marks of internal assessment will be as per the template (Annexure – II).

b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NTC will be conducted by NCVT at the end of each semester as per the guideline of Government of India. The pattern and marking structure is being notified by Govt. of India from time to time. **The learning outcome and assessment criteria will be the basis for setting question papers for final assessment. The examiner during final examination will also check** the individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

The minimum pass percentage for practical is 60% & minimum pass percentage of theory subjects is 40%. For the purposes of determining the overall result, 50% weightage is applied to the result of each semester examination.

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 the assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

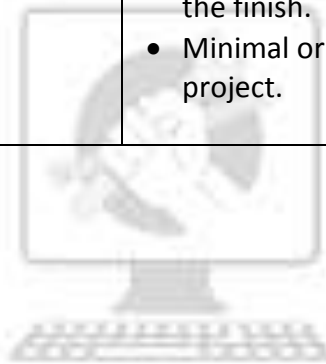
Assessment will be evidence based comprising the following:

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

Evidences of internal assessments are to be preserved until forthcoming semester examination for audit and verification by examining 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	<ul style="list-style-type: none"> • Demonstration of good skill in the use of hand tools, machine tools and workshop equipment. • Below 70% tolerance dimension achieved while undertaking different work with those demanded by the component/job. • A fairly good level of neatness and consistency in the finish. • Occasional support in completing the project/job.
(b) Weightage in the range of 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	<ul style="list-style-type: none"> • Good skill levels in the use of hand tools, machine tools and workshop equipment. • 70-80% tolerance dimension achieved while undertaking different work with those

<p>regard for safety procedures and practices</p>	<p>demand by the component/job.</p> <ul style="list-style-type: none"> • A good level of neatness and consistency in the finish. • Little support in completing the project/job.
<p>(c) Weightage in the range of more than 90% to be allotted during assessment</p>	
<p>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.</p>	<ul style="list-style-type: none"> • High skill levels in the use of hand tools, machine tools and workshop equipment. • Above 80% tolerance dimension 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.



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3. JOB ROLE

Supervisor and Foreman, Plastic Products Making; supervises various plastics product manufacturing processes and ensures proper use of men and materials. Studies specifications, arranges for materials, tools and equipment and guides setting of machines, tools, die, moulds, etc., according to type of article to be made. Gets trial piece made, checks it for dimensions, form and composition and makes alterations if necessary to ensure conformation to prescribed specifications. Supervises machine and other manufacturing processes such as extruding, moulding, injecting of material, etc. and ensures correct production. Maintains necessary records, ensures proper use of men and material and develops methods to minimise wastage. May conduct running repairs of machines and equipment to keep them in working condition.

Plastic Moulding Shop Supervisor; is responsible for supervising the PVC moulding and extrusion activities to create well formed PVC parts for automobile components, maintaining process parameters, conducting quality checks on output product, deploying manpower as per requirement, guiding operatives and technicians to complete the assigned task, maintaining a safe and healthy working environment on the shop floor and maintaining records related to production, rejections, material movement and manpower productivity for a line/shift

Plastic Moulding Technician or Operator; manages the specifications of the plastic and its granules, setting up and operating the moulding machinery and forming and finishing the output.

Moulder, Hand (Plastic); moulds plastics sheets into desired shapes in hand moulding press. Studies specifications for moulded product and assembles mould. Determines weight of charge, pressure, temperature and curing time for moulding; collects plastic sheets, cuts them to required size and heats them on electrically operated heater to soften for moulding; removes sheet when sufficiently heated and places it in female of wooden mould, fixes wooden slab of mould to keep sheet in position and inserts male block of mould; sets mould in hand press and manipulates controls to compress material and form material to shape of mould; removes moulded plastics object after specified time-interval by opening mould; examines and gauges product for conformity to plant or customer standards. May make minor adjustments in moulding procedure to eliminate defects, and remould product.

Plastic Products Making Operatives, Other; perform number of routine and low skilled tasks in manufacturing plastics products, such as arranging and loading plastics or plastics impregnated sheets, assisting Printing Machine Operator, cleaning and finishing moulded plastics products etc. and are designated as: Laminating Press Helper (Plastics) if assists Laminating Press Operator by counting sheets of resin impregnated wood, fabric, paper, or other materials, by

wiping surface of metal plates with cloth and special solution to prevent sticking, and by stacking sheets between plain or engraved plates.

Reference NCO-2015:

- a) 3122.2100
- b) 3122.2200
- c) 8142.1301
- d) 8142.1400
- e) 8142.9900



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4. GENERAL INFORMATION

Name of the Trade	PLASTIC PROCESSING OPERATOR
NCO - 2015	3122.2100, 3122.2200, 8142.1301, 8142.1400, 8142.9900
NSQF Level	Level-4
Duration of Craftsmen Training	One Year (02 Semesters each of six months duration)
Entry Qualification	Passed 10 th class examination under 10+2 System of education with science and mathematics or its equivalent.
Unit Strength (No. Of Students)	16 (Max. supernumeraries seats: 5)
Space Norms	300 Square Meter
Power Norms	13.6 Kw
Instructors Qualification for:	
1. Plastic Processing Operator Trade	<p>Degree in Plastic Technology/ Engineering from recognized University with one year experience.</p> <p style="text-align: center;">OR</p> <p>Diploma in Plastic Technology/ Engineering from recognized board of Technical Education with 2 years' post qualification experience in relevant field.</p> <p style="text-align: center;">OR</p> <p>NTC/ NAC passed in the Trade with 3 years' post qualification experience in the relevant field.</p> <p><u>Desirable:</u> Preference will be given to a candidate with CITS (Craft Instructor Training Scheme) in relevant Trade.</p>
2. Workshop Calculation & Science	<p>Degree in Engineering with one year experience.</p> <p style="text-align: center;">OR</p> <p>Diploma in Engineering with two-year experience.</p> <p><u>Desirable:</u> Craft Instructor Certificate in RoD &A course under NCVT.</p>
3. Engineering Drawing	<p>Degree in Engineering with one year experience.</p> <p style="text-align: center;">OR</p> <p>Diploma in Engineering with two-year experience.</p> <p style="text-align: center;">OR</p> <p>NTC/ NAC in the Draughtsman (Mechanical/ Civil) with three-year experience.</p>

	Desirable: Craft Instructor Certificate in RoD & A course under NCVT.					
4. Employability Skill	<p>MBA OR BBA with two-year experience OR Graduate in Sociology/ Social Welfare/ Economics with two-year experience OR Graduate/ Diploma with two-year experience and trained in Employability Skills from DGT institutes.</p> <p style="text-align: center;">AND</p> <p>Must have studied English/ Communication Skills and Basic Computer at 12th/ Diploma level and above.</p> <p style="text-align: center;">OR</p> <p>Existing Social Studies Instructors duly trained in Employability Skills from DGT institutes</p>					
List of Tools and Equipment	As per Annexure – I					
Distribution of training on hourly basis: (Indicative only)						
Total Hours /Week	Trade Practical	Trade Theory	Workshop Cal. &Sc.	Engg. Drawing	Employability Skills	Extra-curricular activity
40 Hours	25 Hours	6 Hours	2 Hours	3 Hours	2 Hours	2 Hours

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5. NSQF LEVEL COMPLIANCE

NSQF level for **Plastic Processing Operator** trade under CTS: **Level 4.**

As per notification issued by Govt. of India dated- 27.12.2013 on National Skill Qualification Framework total 10 (Ten) Levels are defined.

Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:

- a. Process
- b. Professional Knowledge
- c. Professional Skill
- d. Core Skill
- e. Responsibility



The broad Learning outcome of **Plastic Processing Operator** trade under CTS mostly matches with the Level descriptor at Level- 4.

The NSQF level-4 descriptor is given below:

Level	Process Required	Professional Knowledge	Professional Skill	Core Skill	Responsibility
Level 4	work in familiar, predictable, routine, situation of clear choice	factual knowledge of field of knowledge or study	recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts	language to communicate written or oral, with required clarity, skill to basic Arithmetic and algebraic principles, basic understanding of social political and natural environment	Responsibility for own work and learning.

6. LEARNING/ ASSESSABLE OUTCOME

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

6.1 GENERIC LEARNING OUTCOME

1. Apply safe working practices.
2. Comply with environment regulation and housekeeping.
3. Interpret & use company and technical communication
4. Demonstrate basic mathematical concept and principles to perform practical operations.
5. Understand and explain basic science in the field of study including simple machine.
6. Read and apply engineering drawing for different application in the field of work.
7. Understand and apply the concept in productivity, quality tools, and labour welfare legislation in day-to-day work to improve productivity & quality.
8. Explain energy conservation, global warming and pollution and contribute in day-to-day work by optimally using available resources.
9. Explain personnel finance, entrepreneurship and manage/organize related task in day-to-day work for personal & societal growth.
10. Utilize basic computer applications and internet to take benefit of IT developments in the industry.

6.2 SPECIFIC LEARNING OUTCOME

Semester-I

11. Check and perform measuring, marking, Hack sawing, filling by using various measuring, marking, cutting and finishing tools.
12. Check and perform drilling, tapping, dieing by using different related tools.
13. Test and Perform basic electrical earthings with the accessories fittings on board.
14. Identify different plastic materials and test the properties of material by using various test apparatus.
15. Identify, set and produce good quality of injection moulding items and check the defects.

16. Identify, set, maintain and produce good quality of injection moulding items by using automatic injection moulding machine with the application of Microprocessor control and PLC.
17. Produce good quality of compression moulded items and check the defects by using compression moulding machine.
18. Identify and perform and different FRP processing techniques.

Semester-II

19. Identify and produce good quality of blow moulding items and inspect the finished product.
20. Perform simple pneumatic circuits.
21. Identify different parts, set and operate the blown film plant.
22. Operate the pipe plant and produce good quality pipe
23. Operate the reprocessing plant and produce reprocessed granules.
24. Install and Operate thermoforming machine and identify cycle of thermoforming Produce good quality of thermoforming product and check the defects.
25. Produce good quality of rotomoulding product and check the defects.
26. Identify and Perform predrying process using different materials.
27. Carry out different machining operations on plastic sheets/blocks.

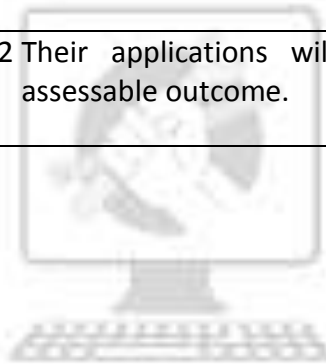
7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING/ ASSESSABLE OUTCOME	
LEARNING / ASSESSABLE OUTCOME	ASSESSMENT CRITERIA
1. Apply safe working practices	1.1 Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements and according to site policy.
	1.2 Recognize and report all unsafe situations according to site policy.
	1.3 Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	1.4 Identify, handle and store/ dispose of dangerous goods and substances according to site policy and procedures following safety regulations and requirements.
	1.5 Identify and observe site policies and procedures with regard to illness or accident.
	1.6 Identify safety alarms accurately.
	1.7 Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	1.8 Identify and observe site evacuation procedures according to site policy.
	1.9 Identify Personal Protective Equipment (PPE) and use the same as per related working environment.
	1.10 Identify basic first-aid and use them under different circumstances.
	1.11 Identify different fire extinguisher and use the same as per requirement.
2. Comply with environment regulation and housekeeping.	2.1 Identify environmental pollution & contribute to the avoidance of instances of environmental pollution.
	2.2 Deploy environmental protection legislation & regulations.
	2.3 Take opportunities to use energy and materials in an environmentally friendly manner.
	2.4 Avoid waste and dispose waste as per procedure.
	2.5 Recognize different components of 5S and apply the same in the working environment.
3. Interpret & use company	3.1 Obtain sources of information and recognize information.
	3.2 Use and draw up technical drawings and documents.



and technical communication.	3.3	Use documents and technical regulations and occupationally related provisions.
	3.4	Conduct appropriate and target oriented discussions with higher authority and within the team.
	3.5	Present facts and circumstances, possible solutions & use special English terminology.
	3.6	Resolve disputes within the team.
	3.7	Conduct written communication.
<hr/>		
4. Demonstrate basic mathematical concept and principles to perform practical operations.	4.1	Semester examination to test basic skills on arithmetic, algebra, trigonometry and statistics.
	4.2	Applications will be assessed during execution of assessable outcome and will also be tested during theory and practical examination.
<hr/>		
5. Understand and explain basic science in the field of study including simple machine.	5.1	Semester examination to test basic skills on science in the field of study including friction, heat, temperature and simple machine.
	5.2	Applications will be assessed during execution of assessable outcome and will also be tested during theory and practical examination.
<hr/>		
6. Read and apply engineering drawing for different application in the field of work.	6.1	Semester examination to test basic skills on engineering drawing.
	6.2	Applications will be assessed during execution of assessable outcome and will also be tested during theory and practical examination.
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7. Understand and apply the concept in productivity, quality tools, and labour welfare legislation in day-to-day work to improve productivity & quality.	7.1	Semester examination to test the concept in productivity, quality tools and labour welfare legislation.
	7.2	Applications will be assessed during execution of assessable outcome.
<hr/>		
8. Explain energy conservation, global warming, pollution and contribute in day-to-day	8.1	Semester examination to test knowledge on energy conservation, global warming and pollution.
	8.2	Their applications will be assessed during execution of assessable outcome.

work by optimally using available resources.	
9. Explain personnel finance, entrepreneurship and manage/organize related task in day-to-day work for personal & societal growth.	<p>9.1 Semester examination to test knowledge on personnel finance, entrepreneurship.</p> <p>9.2 Their applications will be assessed during execution of assessable outcome.</p>
10. Utilize basic computer applications and internet to take benefit of IT developments in the industry.	<p>10.1 Semester examination to test knowledge on basic computer working, basic operating system and uses internet services.</p> <p>10.2 Their applications will be assessed during execution of assessable outcome.</p>



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SPECIFIC LEARNING/ ASSESSABLE OUTCOMES	
Semester-I	
LEARNING/ ASSESSABLE OUTCOME	ASSESSMENT CRITERIA
11. Check and perform measuring, marking, Hack sawing, filling by using various measuring, marking, cutting and finishing tools.	11.1 Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
	11.2 Select raw material and visual inspect for defects.
	11.3 Mark as per specification applying desired mathematical calculation and observing standard procedure.
	11.4 Measure all dimensions in accordance with standard specifications and tolerances
	11.5 Identify Hand Tools for different fitting operations and make these available for use in a timely manner.
	11.6 Prepare the job for Hack sawing, chiseling, filing, drilling, tapping, grinding
	11.7 Perform basic fitting operations viz., Hack sawing, filing, drilling, tapping and grinding to close tolerance as per specification to make the job.
	11.8 Observe safety procedure during above operation as per standard norms and company guidelines
	11.9 Check for dimensional accuracy as per standard procedure
	11.10 Ascertain and select tools and materials for the job and make this available for use in a timely manner.
	11.11 Plan work in compliance with standard safety norms.
	11.12 Produce component by observing standard procedure.
	11.13 Check the dimensions of the produced components to ensure dimensions are within prescribed limit.
	11.14 Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
12. Check and perform drilling, tapping, dieing by using different related tools.	12.1 Ascertain and select tools and materials for the job and make this available for use in a timely manner.
	12.2 Plan work in compliance with standard safety norms.
	12.3 Produce component by observing standard procedure.
	12.4 Check the dimensions of the produced components to ensure dimensions are within prescribed limit.
	12.5 Avoid waste, ascertain unused materials and components for disposal, store these in an



	environmentally appropriate manner and prepare for disposal.
	12.6 Prepare the job for drilling, tapping, dieing,
13. Test and Perform basic electrical earthings with the accessories fittings on board.	13.1 Select appropriate material and hand tools
	13.2 Draw a circuit diagram and Prepare series circuit
	13.3 Draw a circuit diagram and Prepare parallel circuit
	13.4 Draw a circuit diagram and Prepare compound circuit
	13.5 Prepare earthing and check
	13.6 Fit the accessories on board
	13.7 Check the performance with standard parameters.
14. Identify different plastic materials and test the properties of material by using various test apparatus.	14.1 Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
	14.2 Perform different types of test viz., MFI Test, Tensile Testing, Compression Test, Shear test.
	14.3 Perform different types of test viz., Hardness Test, Melting point Test, Impact Test, Cup flow Testing, Water absorption Testing, Haze, gloss testing, Dart impact Testing
	14.4 Perform different types of test viz., Cutting test, Hot iron test, Water flotation test, Scratch test, Dropping test, Melting point test, Burning test, Melt flow index test, Impact test
	14.5 Apply tensile, compressive, hardness test on universal testing machine.
	14.6 Maintain log books and records as required.
	14.7 Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
15. Identify, set and produce good quality of injection moulding items and check the defects.	15.1 Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
	15.2 Observe safety procedure during riveting as per standard norms and company guidelines.
	15.3 Set the temperature by energy regulator
	15.4 Set the mould
	15.5 Prepare raw material
	15.6 Prepare good quality articles by using hand injection moulding machine as per standard norms.
	15.7 Check the product defects and rectify it



	<p>15.8 Maintain log books and records as required.</p> <p>15.9 Shutdown the machine as per procedure</p> <p>15.10 Keep the articles and moulds ,hand tools at designated place</p> <p>15.11 Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.</p>
<p>16. Identify, set, maintain and produce good quality of injection moulding items by using automatic injection moulding machine with the application of Microprocessor control and PLC.</p>	<p>16.1 Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.</p> <p>16.2 Start water circulation pump and confirm the cooling as per required.</p> <p>16.3 Set the processing temperature as per material used</p> <p>16.4 Prepare raw material and feed it in hopper</p> <p>16.5 Select cycle operation mode (hand /semi auto/auto)</p> <p>16.6 Operate the machine</p> <p>16.7 Set the parameters(shotweight, temp., pressure, speed, cooling time)</p> <p>16.8 Produce good quality product and check it.</p> <p>16.9 If any defect occurs, rectify it.</p> <p>16.10 Complete logs and records as required</p> <p>16.11 Shut down the machine and clean the machine area</p> <p>16.12 Load the mould</p> <p>16.13 Select cycle operation mode(hand /semi auto/auto)</p> <p>16.14 Operate the machine</p> <p>16.15 Set the parameters(as per PLC/microprocessor)</p> <p>16.16 Produce good quality product and check it.</p> <p>16.17 If any defect occurs, rectify it.</p> <p>16.18 PM of electrical accessories</p> <p>16.19 PM of hydraulic components</p> <p>16.20 PM of mechanical components</p> <p>16.21 Trial of machine</p> <p>16.22 Maintain log books and records as required.</p> <p>16.23 Unload the mould</p> <p>16.24 Complete logs and records as required</p> <p>16.25 Shut down the machine and clean the machine area</p>
<p>17. Produce good quality of compression moulded items and check the defects by</p>	<p>17.1 Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.</p>



using compression mounding machine.	17.2	Set the temperature
	17.3	Prepare the material (preheat,if required)
	17.4	Select the operating mode(hand/semiauto)
	17.5	Produce good quality product as per specification.
	17.6	Check accuracy/ correctness of the product.
	17.7	If any defect occurs, rectify it
	17.8	Finishing the product
	17.9	Complete logs and records as required
	17.10	Shutdown the machine
	Semester-II	
18. Identify and perform and different FRP processing techniques.	18.1	Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
	18.2	Clean the given mould
	18.3	Prepare the raw material
	18.4	Prepare laminate
	18.5	Keep for curing
	18.6	Eject the laminate from mould
	18.7	Check and finish the product
	18.8	Maintain log books and records as required.
	18.9	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
19. Identify and produce good quality of blow moulding items and inspect the finished product.	19.1	Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
	19.2	Set the temperature
	19.3	Prepare the raw material
	19.4	Keep ready ancillary equipments
	19.5	Set the parison
	19.6	Select the mode of operation
	19.7	Perform the product
	19.8	Check the defect and rectify it
	19.9	Complete logs and records as required
	19.10	Shutdown the machine
	19.11	Mould loading/unloading as per requirement
	19.12	Plan the preventive maintenance as per standards
20. Perform simple pneumatic circuits.	20. 1	Prepare a simple pneumatic circuit as per drawing.
	20. 2	Arrange the pneumatic components as required
	20. 3	Set the components as per circuit



	20.4	Check all the connection as per drawing.
	20.5	Simulate the circuit.
	20.6	Check the performance of circuit
21. Identify different parts, set and operate the blown film plant.	21.1	Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
	21.2	Keep ready ancillary equipments
	21.3	Set processing temperature
	21.4	Prepare the raw material
	21.5	Operate the plant
	21.6	Unloading/loading of winding rolls
	21.7	Complete logs and records as required
	21.8	Shutdown the machine
	21.9	Plan the preventive maintenance as per standards
	21.10	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
22. Operate the pipe plant and produce good quality pipe	22.1	Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
	22.2	Keep ready ancillary equipments
	22.3	Set processing temperature
	22.4	Unload the die
	22.5	Change the screw ,if required
	22.6	Load the die
	22.7	Prepare the raw material
	22.8	Operate the plant
	22.9	Store the pipe in proper manner
	22.10	Complete logs and records as required.
	22.11	Shutdown the machine
	22.12	Plan the preventive maintenance as per standards
	22.13	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
23. Operate the reprocessing plant and produce reprocessed granules.	23.1	Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
	23.2	Check for operation of recycling apparatus like hopper, heaters etc. as per check list provided.



	23.3	Fix the desired Die to the recycling machine in order to achieve the desired operation as per work instructions.	
	23.4	Perform preheating of grinded plastic waste (in case of engineering plastic)	
	23.5	Ensure that the grinded plastic waste are mixed with additives before being fed in to the hopper.	
	23.6	Ensure that the dimensions of the output product are measured as per the process given in the work.	
	23.7	Feed the required operation code in the apparatus for heaters to melt the grinded plastic waste at the pre defined temperature.	
	23.8	Check list procedure to ensure quality of final product.	
	23.9	Complete logs and records as required.	
	23.10	Shutdown the machine	
	23.11	Plan the preventive maintenance as per standards	
	23.12	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.	
	24. Install and Operate thermoforming machine and identify cycle of thermoforming Produce good quality of thermoforming product and check the defects.	24.1	Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
		24.2	Set the temperature
24.3		Set the mould	
24.4		Set the parameters	
24.5		Keep ready ancillary equipments	
24.6		Prepare raw material	
24.7		Operate the machine	
24.8		Finishing and trimming the product	
24.9		Complete logs and records as required.	
24.10		Shutdown the machine	
24.11		Plan the preventive maintenance as per standards	
24.12		Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.	
25. Produce good quality of rotomoulding product and check the defects.	25.1	Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.	
	25.2	Set the temperature	



	25.3	Set the mould
	25.4	Set the parameters
	25.5	Keep ready ancillary equipments
	25.6	Prepare raw material
	25.7	Operate the machine
	25.8	Finishing and trimming the product
	25.9	Complete logs and records as required.
	25.10	Shutdown the machine
	25.11	Plan the preventive maintenance as per standards
	25.12	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
26. Identify and Perform predrying process using different materials.	26.1	Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
	26.2	Set the temperature
	26.3	Loading of material in tray
	26.4	Set parameters
	26.5	Complete logs and records as required
	26.6	Shutdown the machine
	26.7	Plan the preventive maintenance as per standards
	26.8	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
27. Carry out different machining operations on plastic sheets/blocks.	27.1	Perform various operations like Drilling, buffing, screwing, cutting, pasting.
	27.2	Observe and follow safety precautions

SYLLABUS FOR PLASTIC PROCESSING OPERATOR			
FIRST SEMESTER- 6 MONTHS			
Week No.	Ref. Learning Outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
1	Apply safe working practices Comply with environment regulation and housekeeping.	<ol style="list-style-type: none"> 1. Familiarization with the training institute (workshop visit (02 hrs) 2. Identification to safety equipment & their use etc. (03 hrs) 3. General safety precautions while working in PPO section. (05 hrs) 4. Methods of Housekeeping. (05 hrs) 5. Use fire fighting equipments. (05 hrs) 6. Importance of trade training. (05 hrs) 	<ul style="list-style-type: none"> • Departmental training schemes (CTS/ATS). • Importance of trade. • Importance of safety & Rules. • Classes of fire extinguishers. • Introduction about occupational health hazards followed in plastic industries
2-3	Check and perform measuring, marking, Hack sawing, filling by using various measuring, marking, cutting and finishing tools.	<ol style="list-style-type: none"> 7. Perform marking practice straight lines. (05 hrs) 8. Perform hack sawing. (05 hrs) <ul style="list-style-type: none"> • Fit hacksaw blade to frame. • Use different types of hacksaws frames. 9. Perform filling practice - (straights, cross a draw). (15 hrs) 10. Check flatness. (05 hrs) 11. Check right angle. (05 hrs) 12. Check overall dimensions with vernier calliper. (10 hrs) 13. Check overall dimensions with vernier height gauge. (05 hrs). 	<ul style="list-style-type: none"> • Linear measuring Tools (steal rule) • Hand Tools • Marking Tools • Punching Tools • Sawing Tools • Files • Description Types grades &cut
4-5	Check and perform drilling, tapping, dieing by using different related tools.	<p>Drilling Practice</p> <ol style="list-style-type: none"> 14. Identify of different parts of drilling machine. (01 hr) 15. Fit the tool on drilling machine – (02 hrs) 16. Set the job on machine table with machine vice. (01 hrs) 17. Perform drilled hole. (01 hr) 	<ul style="list-style-type: none"> • Drilling machine and its types • Drilling machines its parts and functions • Types of drill • Operation Done of Drilling machine • Tool's used in internal threading Tap&Tap

		<p>18. Perform blind hole. (01 hr)</p> <p>19. Perform counter sunked hole. (01 hr)</p> <p>20. Perform counter boring hole. (01 hr)</p> <p>21. Perform spot facing with drilling machine. (01 hr)</p> <p>22. Inspect hole diameters with the help of vernier caliper per. (02 hrs)</p> <p>Tapping practice</p> <p>23. Illustrate tapping tools (Tap set and Tap wrench). (02 hrs)</p> <p>24. Perform tapping practice with Tap set. (15 hrs)</p> <p>Dieing practice</p> <p>25. Illustrate dieing Tools (Die & Diestock). (01 hr)</p> <p>26. Perform dieing practice with Die. (15 hrs)</p> <p>27. Inspect outside diameters with the help of outside micrometer. (06 hrs)</p>	<p>wrench</p> <ul style="list-style-type: none"> • Tools used in external threading Die& Diestock • Introduction to precision measuring instruments • Vernier caliper • Micrometer • Height gauge • Bevel protector • Least count calculation and it's measurements • Locking devices.
6	Test and Perform basic electrical earthings with the accessories fittings on board.	<p>28. Perform circuits (close open short). (02 hrs)</p> <p>29. Verify Ohm's law. (05 hrs)</p> <p>30. Perform series circuits. (03 hrs)</p> <p>31. Perform parallel circuits. (03 hrs)</p> <p>32. Perform compound circuits. (02 hrs)</p> <p>33. Do earthing & test. (05 hrs)</p> <p>34. Fix the accessories one electric board. (05 hrs)</p> <p>*Need to understand on basic electric safety</p>	<ul style="list-style-type: none"> • Definition of Electrical Quantities and its Units • Ohm's law • Types of circuits and its connections • Types of Fuses • Types of Earthing • Wire & cable • Electric Symbol's
7-8	Identify different plastic materials and test the properties of material by using various test apparatus.	<p>35. Identify plastic (Thermoplastic / Thermoset). (15 hrs)</p> <p>36. Perform MFI Test. (15 hrs)</p> <p>37. Perform Tensile Testing. (02 hrs)</p> <p>38. Perform Compression Test. (02 hrs)</p> <p>39. Perform Shear test. (02 hrs)</p> <p>40. Perform Hardness Test. (02 hrs)</p>	<ul style="list-style-type: none"> • Introduction of plastic • Group of plastic • Properties and used of Thermoplastic materials • * PE *PP * PVC * PMMA * SAN* PC* Nylon * PET. • Properties and Uses of

		<p>41. Perform Melting point Test. (02 hrs)</p> <p>42. Perform Impact Test. (02 hrs)</p> <p>43. Perform Cup flow Testing. (02 hrs)</p> <p>44. Perform Water absorption Testing. (02 hrs)</p> <p>45. Perform Haze, gloss testing. (02 hrs)</p> <p>46. Perform Dart impact Testing. (02 hrs)</p>	<p>Thermosetting materials *PF* UF* MF* EPOXY*</p> <p>Polyester resin (SMC/DMC)</p> <ul style="list-style-type: none"> • Identification of plastic. • Commodity, Engineering, Speciality
9	Identify, set and produce good quality of injection moulding items and check the defects.	<p>INJECTION MOULDING</p> <p>47. Identify different parts of Hand injection moulding machine. (02 hrs)</p> <p>48. Perform Mould setting. (03 hrs)</p> <ul style="list-style-type: none"> • Loading • Perform mould • Loading mould cooling connection • Purging of screw and bearing • Pre-drying requirement <p>49. Set Temperature.(02 hrs)</p> <p>50. Perform IRO. (03 hrs)</p> <p>51. Perform TRO - Single cavity mould. (05 hrs)</p> <p>52. Perform TRO- Double cavity mould. (05 hrs)</p> <p>53. Do preventive maintenance of Hand injection moulding machine. (05 hrs)</p>	<ul style="list-style-type: none"> • Different processing techniques • Classification of Injection moulding machine • Hand injection moulding machine parts and function • Injection moulding cycle • Moulds used in hand injection moulding machine and its terms • Faults, causes and its remedies in hand injection moulding process. <p>Basic knowledge of mould</p> <ul style="list-style-type: none"> • Core • Cavity • Cooling channel • Ejection system • Runner • Gate
10-11	-Do-	<p>54. Identify of different parts of Automatic injection moulding machine (parts & function). (02 hrs)</p> <p>55. Perform Mould setting. (10 hrs)</p> <p>56. Read and set the pressure</p>	<ul style="list-style-type: none"> • Auto injection moulding machine its parts and functions • Screw type injection moulding machine • Plunger type injection

		<p>gauges. (05 hrs)</p> <p>57. Read and set temperature. (02 hrs)</p> <p>58. Perform IRO- (start-up, cycle and shutdown procedure). (10 hrs)</p> <p>59. Perform TRO- single cavity / double cavity mould. (15 hrs)</p> <p>60. Inspect quality (visuals). (01hrs)</p> <p>61. Do preventive maintenance of auto injection moulding machine. (05 hrs)</p>	<p>moulding machine</p> <ul style="list-style-type: none"> • Co-injection • Different type of clamping system • Auto injection moulding machine mould its parts and function • Two plate mould & three plate mould. Hot Runner mould • Processing defects causes and Remedies –(product) • Trouble shooting of injection molding machine.
12-13	<p>Identify, set, maintain and produce good quality of injection moulding items by using automatic injection moulding machine with the application of Microprocessor control and PLC.</p>	<p>MICROPROCESSOR CONTROL & PLC INJECTION MOULDING MACHINE.</p> <p>62. Identify and list out of microprocessor control process parameters. (02 hrs)</p> <p>63. Read and study of process parameters. (05 hrs)</p> <p>64. Perform mould setting. (05 hrs)</p> <ul style="list-style-type: none"> • Mould loading • Cooling / MTC • Hot runner system • Ejection <p>65. Perform Injection unit setting. (02 hrs)</p> <p>66. Perform different pressure setting. (03 hrs)</p> <p>67. Set the temperature. (02 hrs)</p> <p>68. Perform IRO. (03 hrs)</p> <p>69. Set the shot weight. (02 hrs)</p> <p>70. Perform TRO. (15 hrs)</p> <p>71. Shoot out troubles of processing. (2hrs)</p> <p>72. Perform mould unloading - (02 hrs)</p> <p>73. Perform mould loading. (02 hrs)</p> <p>74. Housekeeping of mould. (02 hrs)</p> <p>75. Trouble shooting of machine. (03 hrs)</p>	<ul style="list-style-type: none"> • Introduction about microprocessor control and PLC. • Advantage of Microprocessor and PLC • Electrical injection moulding machines. • Basic principles and feature of thermo set injection moulding process • Comparison between conventional injection moulding machine and PLC & microprocessor control injection moulding machine.

14	-Do-	<p>Preventive maintenance of injection moulding machine</p> <p>76. Do over all cleaning. (05hrs) 77. Do PM of electrical accessories. (10 hrs) 78. Do PM of hydraulic accessories - (10 hrs)</p>	<ul style="list-style-type: none"> • Importance of preventive maintenance • Schedule wise preventive maintenance of injection moulding machine
15	-Do-	<p>79. Identify hydraulic component. (05 hrs) 80. Make hydraulic circuits using single acting cylinder, flow control valve, pressure control valve and pump. (10 hrs) 81. Make hydraulic circuits using double acting cylinder, flow control, pressure control valve pump. (10 hrs)</p>	<ul style="list-style-type: none"> • Introduction about hydraulic system. • Pascal's law. • Different hydraulic component and it function. • Hydraulic symbol's of component.
16-17	Produce good quality of compression moulded items and check the defects by using compression moulding machine	<p>82. Identify of different part of the hand compression moulding machine. (04 hrs) 83. Set the temperature on hand compression moulding machine. (04 hrs) 84. Perform mould setting. (02 hrs) 85. Perform TRO - hand compression. (30 hrs) 86. Do preventive maintenance of hand compression. (10 hrs)</p>	<ul style="list-style-type: none"> • Processing techniques used for thermo set materials • Introducing about compression moulding process • Machinery used for compression moulding process. • Hand compression moulding machine parts and function • Faults causes and remedies of product.
18-19	-Do-	<p>87. Identify of different part of semi-auto compression moulding machine. (02 hrs) 88. Illustrate hydraulic system of compression moulding machine. (02 hrs) 89. Load the mould & set. (10 hrs) 90. Set the temperature. (02 hrs) 91. Perform IRO. (10 hrs) 92. Perform TRO. (20 hrs) 93. Do preventive maintenance of compression moulding</p>	<ul style="list-style-type: none"> • Introduction about semi-auto compression moulding machine. • Semi-auto compression moulding machine parts and function. • Heating system used for mould. • Different types of compression mould • Faults, causes, remedies of processing

		machine. (04 hrs)	<ul style="list-style-type: none"> • Trouble shooting of compression moulding machine • Introduction about transfer moulding process • Comparison of compression moulding & transfer moulding
20-21	Identify and perform and different FRP processing techniques.	94. Distinguish mould and pattern. (02 hrs) 95. Identify different glass fibres. (02 hrs) 96. List out of different raw materials (chemicals). (02 hrs) 97. Perform TRO - FRP hand layup process. (20 hrs) 98. Perform Trimming and cutting / finishing of product. (10 hrs) 99. Decorate the product. (08 hrs) 100 . Housekeeping of mould. (06 hrs)	<ul style="list-style-type: none"> • Introduction of FRP • Advantage of FRP • Materials used in FRP • Process used for FRP • Details of hand lay up process • Spray up process • Vacuum bag. • Pressure bag. • Hot press / matched metal moulding • Faults, causes remedies • Health hazard associated with processing and fabrication.
22-23	Implant –training / project Broad areas: <ul style="list-style-type: none"> (i) Prepare a simple paper weight. (ii) Prepare a simple circuit on teak wood board. (iii) Prepare a wash basin in FRP (iv) Prepare a model of Injection/ Compression moulding machine. (v) Prepare a display board with faulty product. 		
24-25	Revision		
26	Examination		

Note: -

1. Some of the sample project works (indicative only) are given against each semester.
2. Instructor may design their own project and also inputs from local industry may be taken for designing such new project.
3. The project should broadly cover maximum skills in the particular trade and must involve some problem solving skill. Emphasis should be on Teamwork: Knowing the power of

synergy/ collaboration, work to be assigned in a group (Group of at least 4 trainees). The group should demonstrate Planning, Execution, Contribution and Application of Learning. They need to submit Project report.

- 4. If the instructor feels that for execution of specific project more time is required than he may plan accordingly to produce components/ sub-assemblies in appropriate time i.e., may be in the previous semester or during execution of normal trade practical.*



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SYLLABUS FOR PLASTIC PROCESSING OPERATOR

SECOND SEMESTER – 06 Months

Week No.	Ref. Learning Outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
27-28	Identify and produce good quality of blow moulding items and inspect the finished product.	101. Identify different parts of hand blow moulding machine. (05 hrs) 102. Set the temperature. (05 hrs) 103. Set the parison. (02 hrs) 104. Operate the hand blow moulding machine (IRO). (05 hrs) 105. Perform hand blow moulding machine (TRO). (15 hrs) 106. Perform mould unloading. (05 hrs) 107. Load the mould and set. (10 hrs) 108. Do preventive maintenance of hand blow moulding machine. (03 hrs)	<ul style="list-style-type: none"> • Introduction to blow moulding process. • List the blow moulding techniques. • Explain parts and functions of hand blow moulding machine. • Faults, causes & Remedies of hand blow moulding.
29	Perform simple pneumatic circuits.	109. Identify pneumatic components. (05 hrs) 110. Perform pneumatic circuit using pneumatic components (use single acting cylinder). (10 hrs) 111. Perform pneumatic circuits using pneumatic components (use double acting cylinder.). (10 hrs)	<ul style="list-style-type: none"> • Introduction about pneumatic system. • Different pneumatic component and its function. • Pneumatics symbols of component.
30-32	Identify different parts, set and operate the blown film plant.	112. Identify of different parts of the Auto blow molding machine. (10 hrs) 113. Load the mould and set. (05 hrs) 114. Set the temperature. (05 hrs) 115. Perform IRO – auto blow. (10 hrs) 116. Set the parison. (02 hrs) 117. Set the parison wall thickness. (03 hrs) 118. Perform TRO – auto blows. (20 hrs) 119. Unload mould. (04 hrs) 120. Do preventive maintenance of auto blow moulding. (08 hrs) 121. Clean and inspect air compressor. (08 hrs)	<ul style="list-style-type: none"> • Auto blow moulding machine parts and functions. • cycle of Auto blow moulding process. • Different types of blow moulds and its nomenclature. • Stretch blow moulding process. • Other blow moulding techniques. (Extrusion stretch blow (injection stretch blow extrusion blow, intermittent blow, injection blow).

		<p>Blend required materials as per recipe.</p> <p>Understanding for material requirement and planning for material</p>	<ul style="list-style-type: none"> • Faults, causes remedies of blow moulding. • Preventive maintenance of low moulding machine. • Required PPE
33-34	-Do-	122. Recognize the extruder. (05 hrs) 123. Identify of different parts of the control panels. (05 hrs) 124. Set the processing temperature. (05 hrs) 125. Change the screw PVC to PE. (05 hrs) 126. Clean the breaker plate and change screen packs. (05 hrs) 127. Load the Blown film Die. (05 hrs) 128. Connect the heaters of Blown film Die. (05 hrs) 129. Adjust the screw speed Nip rollers & winding rollers. (05 hrs) 130. Perform TRO – (Blown film). (10 hrs)	<ul style="list-style-type: none"> • Introduction to extrusion process. • Materials used for extrusion. • Latest extrusion techniques – (multilayer co-extruder, corrugated pipes.) • Extrusion machine its description use different parts & function. • Blown film extrusion. • Fault, causes Remedies of Blown film.
35-36	Operate the pipe plant and produce good quality pipe	131. Unload blown film die. (05 hrs) 132. Load pipe die. (05 hrs) 133. Set the pipe plant. (05 hrs) 134. Change the screw (PE to PVC). (10 hrs) 135. Set the temperature for pipe processing. (05 hrs) 136. Perform TRO – (pipe). (20 hrs)	<ul style="list-style-type: none"> • PVC compounding and its chemical ingredients • Pipe plant extrusion its units and function • Fault, causes, Remedies of pipe.
37-38	Operate the reprocessing plant and produce reprocessed granules.	137. Load the reprocessing die on extruder. (05 hrs) 138. Prepare raw material for reprocessing. (10 hrs) 139. Illustrate the scrap grinder. (05 hrs) 140. Grind the scrap. (10 hrs) 141. Set the processing temperature for reprocessing. (05 hrs) 142. Perform TRO – (reprocessing of plastic). (15 hrs).	<ul style="list-style-type: none"> • Reprocessing of plastic. • Scrap grinder parts & function & its specification. • Identification code Number for different plastics and its use. • Description about extrusion dies & its parts.

39-40	-Do-	<p>143. Do the preventive maintenance of blown film plant. (15 hrs)</p> <p>144. Do the preventive maintenance of pipe plant. (15 hrs)</p> <p>145. Do the preventive maintenance of reprocessing plant. (15 hrs)</p> <p>146. Do the housekeeping of die. (05 hrs)</p>	<ul style="list-style-type: none"> ● Trouble shooting of extruder. ● Preventive maintenance of extruder. ● Mono filament process. ● Wire coating process. ● Cast film process. ● Calendaring process.
41	Install and Operate thermoforming machine and identify cycle of thermoforming Produce good quality of thermoforming product and check the defects.	<p>147. Demonstrate the thermoforming machine. (05 hrs)</p> <p>148. Set the mould. (05 hrs)</p> <p>149. Set the parameters of the thermoforming machine. (heat timer temperature, cooling system etc). (05 hrs)</p> <p>150. Perform IRO – thermoforming machine. (10 hrs)</p>	<ul style="list-style-type: none"> ● Introduction thermoforming process. ● Thermoforming cycle. ● Materials for thermoforming. ● Mould materials. ● Heating systems.
42	-Do-	<p>151. Prepare the raw material as per mould. (Sheet cutting clamping). (06 hrs)</p> <p><u>Straight vacuum forming.</u></p> <p>152. Operate and prepare product. (15 hrs)</p> <p>153. Finish the thermoformed product. (4 hrs)</p>	<ul style="list-style-type: none"> ● List of different forming process. ● Straight vacuum forming. ● Drape forming. ● Match mould forming. ● Pressure bubble plug assist forming.
43-44	-Do-	<p><u>Drape Forming</u></p> <p>154. Change the mould for drape forming. (05 hrs)</p> <p>155. Operate and prepare product. (10 hrs)</p> <p><u>Matched mould forming</u></p> <p>156. Change and set the mould for matched mould forming. (05 hrs)</p> <p>157. Operate and prepare product. (20 hrs)</p> <p>158. Do preventive maintenance of thermoforming machine. (10 hrs)</p>	<ul style="list-style-type: none"> ● Inline thermoforming process ● Comparison thermoforming and injection molding process. ● Faults, causes & its remedies of thermoforming process. ● Importance of preventive maintenance.

45	Produce good quality of rotomoulding product and check the defects.	159. Identify different types of Rotomoulding machine. (02 hrs) 160. Illustrate the mould. (01 hr) 161. Set the mould. (02 hrs) 162. Prepare the raw material for rotomoulding. (01 hr) 163. Arrange heating system. (01 hrs) 164. Perform TRO – Rotomoulding. (15 hrs) 165. Finish and Decorate product. (01 hrs) 166. Do preventive maintenance of machine. (02 hrs)	<ul style="list-style-type: none"> • Introduction Rotational moulding process. • Advantage and Disadvantage & limitations of rotomodulding. • Cycle of Rotomoulding. • Rotational moulding equipments. • Faults causes Ramedies of Rotomoulding • Materials of Rotational moulding.
46	Identify and Perform predrying process using different materials.	167. Illustrate predrying equipments. (05 hrs) 168. Set the temperature. (01 hr) 169. Load the material in tray. (02 hrs) 170. Set the parameters and predry the material. (15 hrs) 171. Perform over all maintenance of predrying equipment. (02 hrs)	<ul style="list-style-type: none"> • Importance of predrying. • Various predrying equipments. • Predrying temperature and time for various materials. • Safety observed while operating predrying equipment
47	Carry out different machining operations on plastic sheets/blocks.	172. Illustrate the fabricating methods. (02 hrs) 173. Cut the acrylic sheet using acrylic cutter. (10 hrs) 174. Drill the acrylic sheet HDPE Block using hand drill machine. (10 hrs) 175. Perform screwing the acrylic sheet. (03 hrs)	<ul style="list-style-type: none"> • Methods of joining & assembly • Buffing & sanding. • Methods of machining of plastics. • Decoration of plastics.
48-49	Implant training/project Broad areas: <ul style="list-style-type: none"> (i) Prepare a flower pot by using acrylic sheet. (ii) Prepare geometrical solids by using acrylic sheet. (iii) Prepare any one type of mould used in plastic processing (iv) Prepare any model of extrusion plant. (v) Prepare a display chart of predrying materials and its temperature. 		
50-51	Revision		
52	Examination		

Note: -

1. *Some of the sample project works (indicative only) are given against each semester.*
2. *Instructor may design their own project and also inputs from local industry may be taken for designing such new project.*
3. *The project should broadly cover maximum skills in the particular trade and must involve some problem solving skill. Emphasis should be on Teamwork: Knowing the power of synergy/ collaboration, work to be assigned in a group (Group of at least 4 trainees). The group should demonstrate Planning, Execution, Contribution and Application of Learning. They need to submit Project report.*
4. *If the instructor feels that for execution of specific project more time is required than he may plan accordingly to produce components/ sub-assemblies in appropriate time i.e., may be in the previous semester or during execution of normal trade practical.*



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9. SYLLABUS - CORE SKILLS

9.1 WORKSHOP CALCULATION SCIENCE & ENGINEERING DRAWING

S No.	Workshop Calculation and Science	Engineering Drawing
First Semester		
1.	Unit: Systems of unit- FPS, CGS, MKS/SI unit, unit of length, Mass and time, Conversion of units	Engineering Drawing: Introduction and its importance <ul style="list-style-type: none"> - Relationship to other technical drawing types - Conventions - Viewing of engineering drawing sheets - Method of Folding of printed Drawing Sheet as per BIS SP:46-2003
2.	Fractions: Fractions, Decimal fraction, L.C.M., H.C.F., Multiplication and Division of Fractions and Decimals, conversion of Fraction to Decimal and vice versa. Simple problems using a scientific calculator.	Drawing Instruments: their Standard and uses <ul style="list-style-type: none"> - Drawing board, T-Square, Drafter (Drafting M/c), Set Squares, Protractor, Drawing Instrument Box (Compass, Dividers, Scale, Diagonal Scales etc.), Pencils of different Grades, Drawing pins / Clips.
3.	Square Root: Square and Square Root, method of finding out square roots, Simple problem using a calculator.	Lines: <ul style="list-style-type: none"> - Definition, types and applications in Drawing as per BIS SP:46-2003 - Classification of lines (Hidden, centre, construction, Extension, Dimension, Section) - Drawing lines of given length (Straight, curved) - Drawing of parallel lines, perpendicular line - Methods of Division of line segment
4.	Ratio & Proportion: Simple calculation on related problems.	Drawing of Geometrical Figures: Definition, nomenclature and practice of <ul style="list-style-type: none"> - Angle: Measurement and its types, method of bisecting. - Triangle -different types - Rectangle, Square, Rhombus,

		<p>Parallelogram.</p> <ul style="list-style-type: none"> - Circle and its elements.
5.	<p>Percentage: Introduction, Simple calculation. Changing percentage to decimal and fraction and vice-versa.</p>	<p>Lettering and Numbering as per BIS SP46-2003:</p> <ul style="list-style-type: none"> - Single Stroke, Double Stroke, inclined, Upper case and Lower case.
6.	<p>Material Science: Properties -Physical & Mechanical, Types–Ferrous & Non-Ferrous, difference between Ferrous and Non-Ferrous metals, introduction of Iron, Cast Iron, Wrought Iron, Steel, difference between Iron and Steel, Alloy steel, carbon steel, stainless steel, Non-Ferrous metals, Non-Ferrous Alloys.</p>	<p>Dimensioning:</p> <ul style="list-style-type: none"> - Definition, types and methods of dimensioning (functional, non-functional and auxiliary) - Types of arrowhead - Leader Line with text
7.	<p>Mass, Weight and Density: Mass, Unit of Mass, Weight, difference between mass and weight, Density, unit of density, specific gravity of metals.</p>	<p>Freehand drawing of:</p> <ul style="list-style-type: none"> - Lines, polygons, ellipse, etc. - Geometrical figures and blocks with dimension - Transferring measurement from the given object to the free hand sketches.
8.	<p>Speed and Velocity: Rest and motion, speed, velocity, difference between speed and velocity, acceleration, retardation, equations of motions, simple related problems.</p>	<p>Sizes and Layout of Drawing Sheets:</p> <ul style="list-style-type: none"> - Basic principle of Sheet Size - Designation of sizes - Selection of sizes - Title Block, its position and content - Borders and Frames (Orientation marks and graduations) - Grid Reference - Item Reference on Drawing Sheet (Item List)
9.	<p>Work, Power and Energy: Work, unit of work, power, unit of power, Horsepower of engines, mechanical efficiency, energy, use of energy, potential and kinetic energy, examples of potential energy and kinetic energy.</p>	<p>Method of presentation of Engineering Drawing:</p> <ul style="list-style-type: none"> - Pictorial View - Orthogonal View - Isometric view
10.	<p>-----</p>	<p>Symbolic Representation (as per BIS SP:46-2003) of:</p> <ul style="list-style-type: none"> - Fastener (Rivets, Bolts and Nuts) - Bars and profile sections

		<ul style="list-style-type: none"> - Weld, brazed and soldered joints - Electrical and electronics element - Piping joints and fittings -
Second Semester		
1.	<p>Algebra: Addition, Subtraction, Multiplication, Division, Algebraic formula, Linear equations (with two variables).</p>	Construction of Scales and diagonal scale
2.	<p>Mensuration: Area and perimeter of square, rectangle, parallelogram, triangle, circle, semi-circle.</p> <p>Volume of solids – cube, cuboids, cylinder and Sphere.</p> <p>Surface area of solids – cube, cuboids, cylinder and Sphere.</p>	Practice of Lettering and Title Block
3.	<p>Trigonometry: Trigonometrical ratios, measurement of angles.</p> <p>Trigonometric tables</p>	<p>Dimensioning practice:</p> <ul style="list-style-type: none"> - Position of dimensioning (unidirectional, aligned, oblique as per BIS SP:46-2003) - Symbols preceding the value of the dimension and dimensional tolerance. - Text of dimension of repeated features, equidistance elements, circumferential objects.
4.	<p>Heat & Temperature: Heat and temperature, their units, difference between heat and temperature, boiling point, melting point, scale of temperature, relations between different scale of temperature, Thermometer, promoter, transmission of heat, conduction, convection, radiation.</p>	<p>Construction of Geometrical Drawing Figures:</p> <ul style="list-style-type: none"> - Different Polygons and their values of included angles. Inscribed and Circumscribed polygons. - Conic Sections (Ellipse & Parabola)
5.	<p>Basic Electricity: Introduction, use of electricity, how electricity is produced, Types of current_ AC, DC, their comparison, voltage, resistance, their</p>	Drawing of Solid figures (Cube, Cuboids, Cone, Prism, Pyramid, Frustum of Cone and Pyramid) with dimensions.

	units. Conductor, insulator, Types of connections– series, parallel, electric power, Horsepower, energy, unit of electrical energy.	
6.	<p>Levers and Simple Machines: Levers and its types.</p> <p>Simple Machines, Effort and Load, Mechanical Advantage, Velocity Ratio, Efficiency of machine, Relationship between Efficiency, velocity ratio and Mechanical Advantage.</p>	Free Hand sketch of hand tools and measuring tools used in the respective trades.
7.	-	<p>Projections:</p> <ul style="list-style-type: none"> - Concept of axes plane and quadrant - Orthographic projections - Method of first angle and third angle projections (definition and difference) - Symbol of 1st angle and 3rd angle projection as per IS specification
8.	-	Drawing of Orthographic projection from isometric/3D view of blocks
9.	-	Orthographic Drawing of simple fastener (Rivet, Bolts, Nuts & Screw)
10.	-	Drawing details of two simple mating blocks and assembled view.

9.2 EMPLOYABILITY SKILLS

CORE SKILL – EMPLOYABILITY SKILL	
First Semester	
1. English Literacy	Duration : 20 hrs Marks : 09
Pronunciation	Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)
Functional Grammar	Transformation of sentences, Voice change, Change of tense, Spellings.
Reading	Reading and understanding simple sentences about self, work and environment
Writing	Construction of simple sentences Writing simple English
Speaking/ Spoken English	Speaking with preparation on self, on family, on friends/ classmates, on known people, picture reading, gain confidence through role- playing and discussions on current happening, job description, asking about someone's job, habitual actions. Cardinal (fundamental) numbers, ordinal numbers. Taking messages, passing on messages and filling in message forms, Greeting and introductions, office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.
2. IT Literacy	Duration : 20 hrs Marks : 09
Basics of Computer	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of the computer.
Computer Operating System	Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc. Use of Common applications.
Word Processing and Worksheet	Basic operating of Word Processing, Creating, Opening and Closing Documents, Use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & Creation of Tables. Printing document. Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample



	worksheets, use of simple formulas and functions, Printing of simple excel sheets.
Computer Networking and Internet	Basic of Computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, WebSite, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication. Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.
3. Communication Skills	
	Duration : 15 hrs Marks : 07
Introduction to Communication Skills	Communication and its importance Principles of effective communication Types of communication - verbal, non-verbal, written, email, talking on phone. Non-verbal communication -characteristics, components-Para-language Body language Barriers to communication and dealing with barriers. Handling nervousness/ discomfort.
Listening Skills	Listening-hearing and listening, effective listening, barriers to effective listening, guidelines for effective listening. Triple- A Listening - Attitude, Attention & Adjustment. Active listening skills.
Motivational Training	Characteristics essential to achieving success. The power of positive attitude. Self awareness Importance of commitment Ethics and values Ways to motivate oneself Personal goal setting and employability planning.
Facing Interviews	Manners, etiquettes, dress code for an interview Do's & don'ts for an interview

Behavioral Skills	Problem solving Confidence building Attitude
Second Semester	
4. Entrepreneurship Skills	Duration : 15 hrs Marks : 06
Concept of Entrepreneurship	Entrepreneur - Entrepreneurship - Enterprises: Conceptual issue Entrepreneurship vs. management, Entrepreneurial motivation. Performance & record, Role & function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.
Project Preparation & Marketing Analysis	Qualities of a good entrepreneur, SWOT and risk analysis. Concept & Application of PLC, Sales & Distribution management. Difference between small scale & large scale business, Market survey, Method of marketing, Publicity and advertisement, Marketing mix.
Institution's Support	Preparation of project. Role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarize with the policies / programmes, procedure & the available scheme.
Investment Procurement	Project formation, Feasibility, Legal formalities i.e., Shop act, Estimation & costing, Investment procedure - Loan procurement - Banking processes.
5. Productivity	Duration : 10 hrs Marks : 05
Benefits	Personal/ Workman - Incentive, Production linked Bonus, Improvement in living standard.
Affecting Factors	Skills, Working aids, Automation, Environment, Motivation - How it improves or slows down productivity.
Comparison with Developed Countries	Comparative productivity in developed countries (viz. Germany, Japan and Australia) in select industries, e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.
Personal Finance Management	Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and insurance.
6. Occupational Safety, Health and Environment Education	Duration : 15 hrs Marks : 06



Safety & Health	Introduction to occupational safety and health Importance of safety and health at workplace.
Occupational Hazards	Basic hazards, chemical hazards, vibroacoustic hazards, mechanical hazards, electrical hazards, thermal hazards. occupational health, occupational hygiene, occupational diseases/ disorders & its prevention.
Accident & Safety	Basic principles for protective equipment. Accident prevention techniques - control of accidents and safety measures.
First Aid	Care of injured & sick at the workplaces, First-aid & transportation of sick person.
Basic Provisions	Idea of basic provision legislation of India. Safety, health, welfare under legislative of India.
Ecosystem	Introduction to environment. The relationship between society and environment, ecosystem and factors causing imbalance.
Pollution	Pollution and pollutants including liquid, gaseous, solid and hazardous waste.
Energy Conservation	Conservation of energy, re-use and recycle.
Global Warming	Global warming, climate change and ozone layer depletion.
Ground Water	Hydrological cycle, ground and surface water, Conservation and harvesting of water.
Environment	Right attitude towards environment, Maintenance of in-house environment.
7. Labour Welfare Legislation	
Duration : 05 hrs Marks : 03	
Welfare Acts	Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's Compensation Act.
8. Quality Tools	
Duration : 10 hrs Marks : 05	
Quality Consciousness	Meaning of quality, Quality characteristic.
Quality Circles	Definition, Advantage of small group activity, objectives of quality

	circle, Roles and function of quality circles in organization, Operation of quality circle. Approaches to starting quality circles, Steps for continuation quality circles.
Quality Management System	Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.
House Keeping	Purpose of housekeeping, Practice of good housekeeping.
Quality Tools	Basic quality tools with a few examples.



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LIST OF TOOLS AND EQUIPMENT			
PLASTIC PROCESSING OPERATOR (For batch of 16 candidates)			
S No.	Name of the Tools & Equipment	Specification	Qty
A. TRAINEES TOOL KIT (For each additional unit trainees tool kit sl. 1-15 is required additionally)			
1.	Calliper	Inside Spring - 150 mm	4 Nos.
2.	Calliper	Outside - Spring - 150 mm	4 Nos.
3.	Divider	spring type – 150 mm	4 Nos.
4.	Odd leg calliper	firm joint 0- 150 mm	4 Nos.
5.	Screw Driver	10 X 200 mm	6 Nos.
6.	File card		2 Nos.
7.	Hammer	Ball Peen - 500 grams	6 Nos.
8.	Steel Rule	300 mm, Graduated both in Metric and English Unit	4 Nos.
9.	Engineer's Square	150 mm Blade	8 Nos.
10.	Hacksaw Frame - Adjustable	300 mm	8 Nos.
11.	Centre Punch	Diameter - 10 mm and Length - 100 mm	8 Nos.
12.	File - Flat - Bastard	300 mm	8 Nos.
13.	File - Flat - Second Cut	250 mm	8 Nos.
14.	File - Flat - Safe Edge	200 mm	8 Nos.
15.	File - Triangular	Smooth - 200 mm	8 Nos.
B. INSTRUMENTS AND GENERAL SHOP OUTFIT - For 2 (1+1) units no additional items are required			
16.	Bench Vice	150 mm	8 Nos.
17.	Micrometer - Outside	Digital- 0 - 25 mm	2 Nos.
18.	Micrometer - Outside	25 - 50 mm	2 Nos.
19.	Vernier Calliper	Digital - 0 - 200 mm	2 Nos.
20.	Surface Plate - Granite	300 x 300 mm with Stand and Cover	1 No.
21.	Drill Twist Set	1.5 mm to 15 mm by 0.5 mm	1 No.
22.	Taps set	3mm to 10mm, Set of 9 Pieces	1 No.
23.	Dies Set	3 mm to 10 mm	1 No.
24.	Cooling tower	10TR	1 No.
25.	Mono block pump	2HP	2 Nos.
26.	Vernier Bevel Protractor	300 mm Blade with Acute Angle Attachment	2 Nos.
27.	Vernier Height Gauge	0 - 300 mm with least count = 0.02 mm	1 No.



C. GENERAL MACHINERY			
28.	Drilling Machine	13 mm Electric with Hammer Action	2 Nos.
29.	Pillar Drill Machine	Motorized up to 13 mm Capacity	1 No.
30.	Pedestal Grinder	Double Ended - 200 mm	1 No.
31.	Test Equipment for plastic -MFI		1 No.
32.	Universal Testing machine for Plastic		1 No.
33.	Impact tester.		1 No.
34.	Plastic scrap grinder		1 No.
35.	Pre heater	12 trays of 25 kgs. Of 20 minutes capacity.	1 No.
36.	Hand operated Injection Moulding machine	15 grams capacity	4 Nos.
37.	Hand operated Injection Moulding machine	30 grams capacity	4 Nos.
38.	Automatic screw type Injection Moulding Machine	with moulds and accessories as required 80 to 85 T capacity (with Microprocessor/PLC Controller)	1 No.
39.	Hand operated Compression Moulding Machine	with moulds – 30 to 60 T. capacity	4 Nos.
40.	Automatic compression moulding machine	with moulds and accessories as required – 100 T capacity (with Microprocessor/PLC controller)	1 No.
41.	Hand operated Blow Moulding Machine	with moulds and accessories of 250 ml capacity with clamping system.	4 Nos.
42.	Automatic Extrusion Blow Moulding Machine	with set of moulds and accessories - 1 to 2 liter capacity (with Microprocessor/PLC controller)	1 No.
43.	Extruder of 40 kg/hr. Plasticizing capacity	with re-processing die including granulator/cutter for PE & PP.	1 No.
44.	Pipe extruder of 40 kg/hr. Plasticizing capacity	with pipe die (1/2 inch & 1 inch diameter) to process PE & PP.	1 No.
45.	Extruder of 40 kg/hr. Plasticizing capacity	for single layer Blown film plant including die (18 inch LFW) & accessories.	1 No.
46.	Thermo/Vacuum forming Machine with		1 No.

	Mould		
47.	Rotational moulding Machine with Mould		1 No.
48.	Hydraulic trainer kit	Hydraulic Trainer with Equipment trays - 2nos., Pressure gauge – 2 nos., Hydraulic Motor -1 no., 4/2-way hand lever valve - 3no.s, 4/3-way hand lever valve with relieving mid-position - 3nos., 4/3-way hand lever valve with closed mid-position - 3nos., 4/3-way hand lever valve with recirculating mid-position - 3 nos., Pressure sequence valve, pressure relief valve – 3 nos., 3-way pressure reducing valve – 2 nos., 2-way flow control valve – 2 nos., One-way flow control valve - 4nos., Non-return valves – 4 nos., Shut-off valve- 4 nos., Diaphragm accumulator with shut-off block – 1 no., Weight up to 10 kg- 1 no., 2/2 way plunger / stem actuated – 2 nos., Standard hoses with quick connectors, Flow dividing valve – 1 no., 5-way distributor with pressure gauge - 1no.s, All these accessories are mounted on M.S.fabricated frame.	1 No.
49.	Pneumatic trainer kit	Pneumatic trainer consists with Pressure Gauge, Pneumatic Motor, Single Acting Cylinder, Double Acting Cylinder, Air Filter Regulator Lubricator with Pressure Gauge Hand Lever Operated Valves : 2 Nos, 5/2 way & 3/2-way, Solenoid Valve: 2 Nos, 5/2 way & 3/2 way, Pilot Operated Valve: 5/3 Spring Centered,	1 No.

		5/2Spring Returned, 3/2 Pilot Operated. Palm Operated Valve: 3/2-way Valve, Roller Lever Valve : 5/2 way, 3/2-way Valve, Shuttle Valve: OR Valve, AND Valve: Dual Pressure Valve, Flow Control Valve, Non-Return Valve, Block Manifold: 6 ways, Plastic Tubing as per require, Quick Push-Pull connectors, Air Compressor, all these are pneumatic components are mounting on a aluminum profile plate.	
50.	Programable logic control	At least digital 4 input & 4 Output, 4 analog input & output) At least digital 8 input & 8 Output, 4 analog input & output with simulation software and hardware for understanding PLC programming and functioning , operation for plastic machinaries.	1 No.
51.	Strech Blow Moulding Machine- 1 liter with mould		1 No.
52.	Air compressor with air treatment accessories 5 HP		
D. Furniture			
53.	Black/ White Board with Stand - 4 X 3 Feet		1 No.
54.	Discussion Table/ Working Table = L:W:H = 8:4:3 Feet - Heavy Wooden Top		1 No.
55.	Instructor/ Office Chair		2 Nos.
56.	Instructor/ Office Table		1 No.
57.	Notice Board - 2 X 3 Feet		1 No.

58.	Steel Almirah - Large		2 Nos.
59.	Steel Locker - 12 Pigeon Hole		2 Nos.
60.	Steel Rack		1 No.
61.	Stool - Height 450 mm		16 Nos.

TOOLS & EQUIPMENTS FOR EMPLOYABILITY SKILLS		
S No.	Name of the Equipment	Quantity
1.	Computer (PC) with latest configurations and Internet connection with standard operating system and standard word processor and worksheet software	10 nos.
2.	UPS – 500Va	10 nos.
3.	Scanner cum Printer	1 no.
4.	Computer Tables	10 nos.
5.	Computer Chairs	20 nos.
6.	LCD Projector	1 no.
7.	White Board 1200mm x 900mm	1 no.
Note: Above Tools & Equipments not required, if Computer LAB is available in the institute.		



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FORMAT FOR INTERNAL ASSESSMENT

Name & Address of the Assessor:			Year of Enrollment:											
Name & Address of ITI (Govt./Pvt.) :			Date of Assessment:											
Name & Address of the Industry:			Assessment location: Industry / ITI											
Trade Name:		Semester:		Duration of the Trade/course:										
Learning Outcome:														
S No	Maximum Marks (Total 100 Marks)		15	5	10	5	10	10	5	10	15	15	Total Internal Assessment Marks	Result (Y/N)
	Candidate Name	Father's/Mother's Name	Safety Consciousness	Workplace Hygiene	Attendance/ Punctuality	Ability to follow Manuals/ Written Instructions	Application of Knowledge	Skills to Handle Tools & Equipment	Economical Use of Materials	Speed in Doing Work	Quality in Workmanship	VIVA		
1														
2														