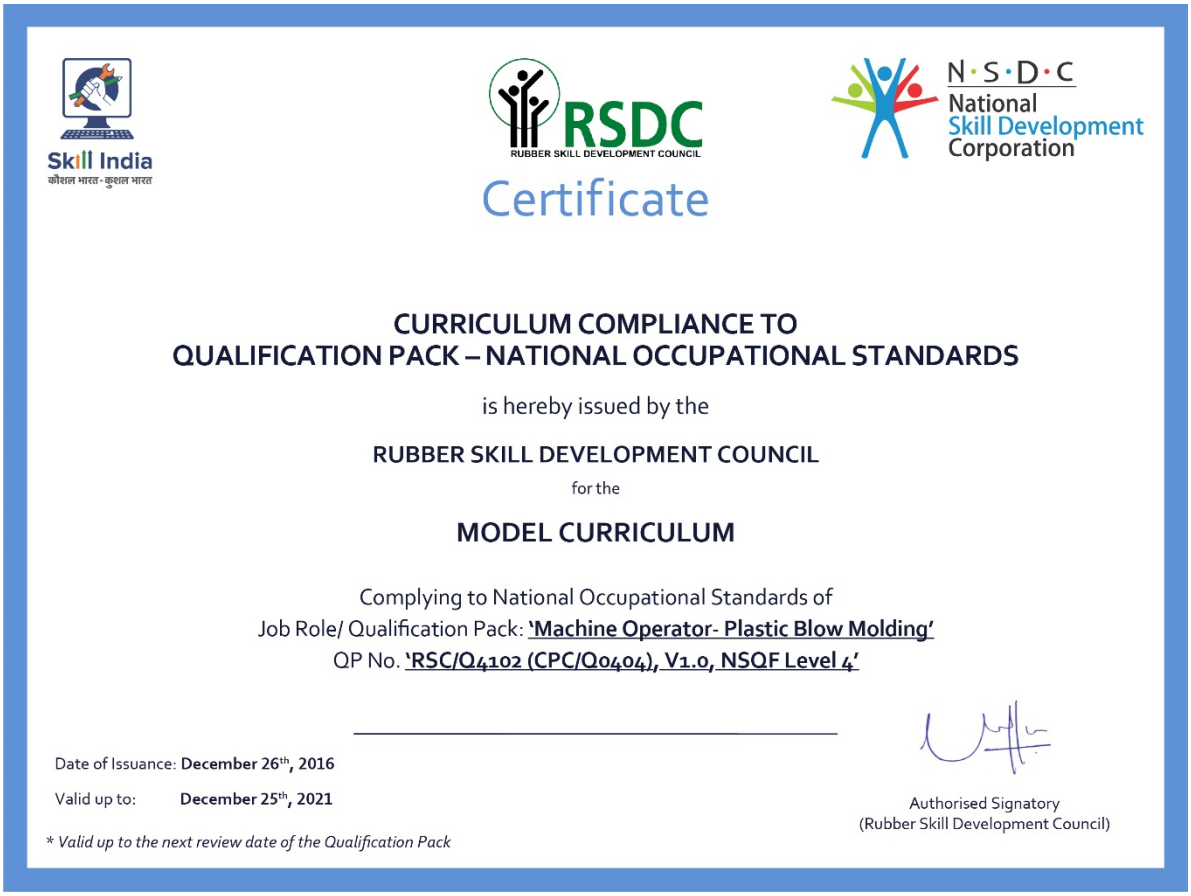
Model Curriculum

Machine Operator- Plastic Blow Moulding

SECTOR:	**RUBBER**
SUB-SECTOR:	**PLASTICS PROCESSING**
OCCUPATION:	**BLOW MOULDING**
REF ID:	**RSC/Q4102 (CPC/Q0404), V 1.0**
NSQF LEVEL:	**4**



Skill India
कौशल भारत-कुशल भारत

RSDC
RUBBER SKILL DEVELOPMENT COUNCIL

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National
Skill Development
Corporation

Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

RUBBER SKILL DEVELOPMENT COUNCIL

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: **'Machine Operator- Plastic Blow Molding'**
QP No. **'RSC/Q4102 (CPC/Q0404), V1.0, NSQF Level 4'**

Date of Issuance: **December 26th, 2016**

Valid up to: **December 25th, 2021**

** Valid up to the next review date of the Qualification Pack*

Authorised Signatory
(Rubber Skill Development Council)

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Machine Operator- Plastic Blow Moulding

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of an "Machine Operator – Plastic Blow Moulding", in the "Rubber Skill Development Council" Sector/Industry and aims at building the following key competencies amongst the learners.

Program Name	**Machine Operator – Plastic Blow Moulding**		
Qualification Pack Name & Reference ID	RSC/Q4102 (CPC/Q0404), V 1.0		
Version No.	1.0	**Version Update Date**	29/05/2019
Pre-requisites to Training	VIIIth Standard		
Training Outcomes	**After completing this programme, participants will be able to:** • Identify fitting tools, measuring equipment and practise using them • Define polymers and thermoplastics materials • Examine the basics of plastics processing methods • Demonstrate advanced method for fitting tools measuring equipment and practice • Identify the method for testing polymers and thermoplastics materials • Define the basics of plastics processing • Demonstrate advanced blow molding techniques for plastics processing • Inspect the finished products. • Identify auxiliary equipment in plastics processing. • Demonstrate advanced mold technology techniques for plastics processing • Demonstrate communication/soft skills. • Follow quality management systems. • Maintain basic health and safety practices at the workplace		

This course encompasses 9 out of 9 National Occupational Standards (NOS) of "Machine Operator-Plastic Blow Moulding" Qualification Pack issued by "Rubber Skill Development Council".

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1.	**Introduction to the Job Role** **Theory Duration** (hh:mm) 20:00 **Practical Duration** (hh:mm) 10:00 **Corresponding NOS Code** Bridge Module	• Explain the history of development of plastic products • Evaluate current industrial scenario of plastics • Identify the types of plastic • List major industrial associations related to blow moulding. • Identify equipment used for blow moulding • Describe the roles and responsibilities of a machine operator - plastic blow moulding.	• LCD Projector, White Board with marker and duster, charts etc • Pen drives, computers etc for conducting class.
2.	**Advanced method for fitting tools measuring equipment** **Theory Duration** (hh:mm) 24:00 **Practical Duration** (hh:mm) 56:00 **Corresponding NOS Code** RSC/N4109 (CPC/N0420)	• Maintain a hazard free workplace • Ensue that all tools, equipment, power tool cables, extension leads are in a safe and usable condition • Assemble job specification from a valid and approved source • Identify job requirements from the job specification document • Rectify incorrect information in the job specification document • Prepare fitting operations as per procedure • Check that all measuring instruments are calibrated • Ensure that the components used are free from foreign objects, dirt and corrosion • Assemble correct work pieces and consumables • Assemble appropriate tools and measuring instruments. • Organize work pieces as per job requirements • Identify specified features with the help of marking-out methods on the work pieces • Identify templates for tracing/transferring the specified features on the work pieces as per drawing	• LCD Projector, White Board with marker and duster, charts etc • Pen drives, computers etc for conduct of class. • Common hand tools like Vernier calliper, micrometer, drills, tapes and dies etc • Plastics raw material like PP, HDPE, PET, PBT, PVC etc for training on machines of Blow grade from good/reputed supplier. • Basics machines for training like hand blow moulding, semiautomatic blow moulding, Automatic blow moulding, • Pre drying system like Oven Drier, Hopper Drier, Dehumidifier, Chillers etc.

		• Demonstrate how to transfer the specified features from the templates onto the work pieces as per drawing • Perform fitting operations on various forms of metal components using a range of hand tools and manually operated machines • Comply with specified machining sequence and procedure • Check the components to ensure completeness of work • Check the quality of the output as per required standards, using visual checks and measurement of dimensional parameters • Demonstrate how to produce components with various features as per standards applicable • Check the finished components as per job requirement • Perform documentation during and post operations • Maintain a safe and tidy work area after completion of job.	
3.	**Types of polymers, thermoplastics and their importance** **Theory Duration** (hh:mm) 24:00 **Practical Duration** (hh:mm) 56:00 **Corresponding NOS Code** RSC/N4110 (CPC/N0421)	• Define the basic importance of polymers in human life. • Elaborate the terminologies related to polymers • Categorise polymers- polymer structure and morphology etc • Elaborate monomers and polymers • Discuss the types of polymers- thermoplastics, elastomers • Define polymerization • Elaborate the types of polymerization, condensation, addition, copolymerization • Elaborate characterization • Elaborate polymer solution • Determine the measurement of molecular weight, sizes-structure and properties of polymers. • Analyse the commodity polymers: Polyolefin: LDPE – HDPE – LLDPE, PP etc. • Identify the engineering polymers: PC, ABS, PMMA, POM, PA-	• Common hand tools like Vernier calliper, micrometer, drills, tapes and dies etc • Plastics raw material like PP, HDPE, PET, PBT, PVC etc for training on machines of Blow grade from good/reputed supplier. • Basics machines for training like hand blow moulding, semiautomatic blow moulding, Automatic blow moulding, • Pre drying system like Oven Drier, Hopper Drier, Dehumidifier, Chillers etc.

		NYLON etc. • Define special polymers: FEP, PVDF etc. • Practise conventional methods of identification like drop test, water floatation test scratch test • Practise advanced methods of identification: -MFI, Melting • List common acronyms in the plastics and commercial trade.	
4.	**Analyze plastics processing methods** **Theory Duration** (hh:mm) 20:00 **Practical Duration** (hh:mm) 44:00 **Corresponding NOS Code** RSC/N4104 (CPC/N0414)	• Categorize all plastics processing machineries • Identify merits and demerits of plastic blow moulding over all others process • Discuss the terminologies related to plastic processing • Demonstrate the finishing operation including surface treatment of the fabricated product • Comply with the primary processing methods as per SOP • Comply with the secondary processing methods as per SOP • Define the fundamentals of processing method	• Common hand tools like Vernier calliper, micrometer, drills, tapes and dies etc • Plastics raw material like PP, HDPE, PET, PBT, PVC etc for training on machines of Blow grade from good/reputed supplier. • Basics machines for training like hand blow moulding, semiautomatic blow moulding, Automatic blow moulding, • Pre drying system like Oven Drier, Hopper Drier, Dehumidifier, Chillers etc.
5.	**Basics of plastics processing methods** **Theory Duration** (hh:mm) 16:00 **Practical Duration** (hh:mm) 40:00 **Corresponding NOS Code** RSC/N4104 (CPC/N0414)	• Discuss the machine operation terminologies like semiautomatic, fully automatic • Analyse the type of conversion technique like Injection, blow, compression, transfer, rotational • Identify the materials to be processed • Comply with the product design / configuration, tolerance. • Comply with the process limitations and quality • Comply with the cost and performance balance. • Distinguish the type of process to be used depending on a variety of factors, including product shape and size, plastic type, quantity to be produced, quality and accuracy (Tolerances) required, design load performance, cost limitation, and	• Plastics raw material like PP, HDPE, PET, PBT, PVC etc for training on machines of Blow grade from good/reputed supplier. • Basics machines for training like hand blow moulding, semiautomatic blow moulding, Automatic blow moulding, • Pre drying system like Oven Drier, Hopper Drier, Dehumidifier, Chillers etc.

		time schedule	
6.	**Advanced blow moulding techniques** **Theory Duration** (hh.mm) 30:00 **Practical Duration** (hh.mm) 70:00 **Corresponding NOS Code** RSC/N4111 (CPC/N0423)	• Analyse the principle of blow moulding process. • Demonstrate plasticizing/ melting the resin • Perform production and blowing of parison • Perform ejection of the part and trim • Identify the need of tools, accessories and machineries. • Identify the plastic material to be used for blow moulding • Analyze various types of extrusion blow moulding and process. • Demonstrate continuous blow moulding process - single head method, twin station method, rotary table system • Demonstrate intermitted blow moulding process - reciprocating screw extruder, ram accumulator extrusion accumulator head method • Demonstrate the process of the Extrusion Blow Moulding (EBM) • Demonstrate the process of Injection Blow Moulding (IBM) • Demonstrate the process of Injection Stretch Blow Moulding (ISBM) • Demonstrate the process of Extrusion Stretch Blow Moulding(ESBM) • Identify various types of blow moulds-side feed, centre feed, spiral mandrel, extrusion blow, stretch blow, injection blow moulds etc. • Set the PET injection moulding machine operation merits and demerits/over other moulding process • Demonstrate how to load the material in the correct pattern as per SOP to minimize material overflow/ wastage/ excess flash • Check the identified feed strip for dimension uniformity/identified granules • Prepare the plastic compound or	• LCD Projector, White Board with marker and duster, charts etc • Pen drives, computers etc for conduct of class. • Common hand tools like Vernier calliper, micrometer, drills, tapes and dies etc • Plastics raw material like PP, HDPE, PET, PBT, PVC etc for training on machines of Blow grade from good/reputed supplier. • Basics machines for training like hand blow moulding, semiautomatic blow moulding, Automatic blow moulding, Automatic Hopper Loader, Hot air oven and Dryer, Dehumidifier, Mould Temperature Controller, Scrap Grinder, Crane, Air Compressor, Hot air blow Gun, Water cooling Tower, Hand Operated Blow Moulding M/C with accessories, Semi-Automatic Blow Moulding Machine, Fully Automatic Single stage Blow Moulding machine, Full Automatic Double stage Blow Moulding machine, Injection stretch Blow Moulding Machine • Pre drying system like Oven Drier, Hopper Drier, Dehumidifier, Chillers etc.

		granule for feeding into the machine • Demonstrate how to feed the machine • Set the moulding pressure and temperature during the process cycle • Check the mould lifting/ ejection/ slide mechanism of the press • Comply with SOP for manufacturing • Practice manufacturing the preform from the mould as per SOP. • Check operation of moulding apparatus like hopper, heaters, extruder, blow moulding die/mould, screen pack etc. as per the checklist • Demonstrate how to fix the desired die/mould to the blow moulding machine apparatus in order to achieve the desired operation • Modify the process parameters (by selecting the right program from the machine control system) if required and ensure alignment with the prescribed standards • Check the preliminary requirement and preparation of raw material use • Check the parameters – temperature, pressure, current, extruder speed etc. • Plan how to setup the apparatus as per the selected process and the moulding standards • Adjust the temperature and other parameters of the moulding apparatus • Ensure availability of the coolant in the valves • Check the functionality and assembly of die as per SOP. • Adjust the parison controlling and program the parison with the help of parison programming tools • Check the dye shaping in blow moulding. • Analyze the types of mandrel used in blow moulding. -divergent	

		and convergent. • Identify the blow ratio, parison swell, die swell, types of parison blowing system -Pneumatic and Ejection system. • Comply with the moulding procedure and process to be adopted for completing the work order • Adjust moulding parameters like temperature of the heaters, back pressure/ air pressure/ vacuum pressure, screw speed of the extruder, regulating current, flow of coolant/ water etc. before starting the process.	
7.	**Inspection of the finished products** **Theory Duration** (hh.mm) 30:00 **Practical Duration** (hh.mm) 70:00 **Corresponding NOS Code** RSC/N4111 (CPC/N0423)	• Manage the raw materials required for the activity • Ensure that the required material is procured from the store • Ensure that the dye is available for operations • Identify the number of heaters required for the extruder assembly • Perform preheating of plastic granules to improve their tensile strength • Ensure that the plastic granules are mixed with additives (if any) before being fed into the hopper • Demonstrate how to turn valves of machines to regulate screw speed and quantity of the plastic coming out of the hopper • Ensure that pouring is in line with defined standards and specifications • Demonstrate how to document the feeding observations like interrupted pouring or any abnormality • Demonstrate extrusion blow moulding. • Demonstrate injection blow moulding. • Demonstrate extrusion injection stretch blow moulding. • Demonstrate multilayer blow moulding. • Practise optimization of process parameters	• Plastics raw material like PP, HDPE, PET, PBT, PVC etc for training on machines of Blow grade from good/reputed supplier. • Basics machines for training like hand blow moulding, semiautomatic blow moulding, Automatic blow moulding, Automatic Hopper Loader, Hot air oven and Dryer, Dehumidifier, Mould Temperature Controller, Scrap Grinder, Crane, Air Compressor, Hot air blow Gun, Water cooling Tower, Hand Operated Blow Moulding M/C with accessories, Semi-Automatic Blow Moulding Machine, Fully Automatic Single stage Blow Moulding machine, Full Automatic Double stage Blow Moulding machine, Injection stretch Blow Moulding Machine • Pre drying system like Oven Drier, Hopper Drier, Dehumidifier,

		• Conduct a test process and produce a sample output as per the sketches/ engineering drawing • Ensure that the hollow articles (bottles, container) for geometry, material and dimensional parameters as per the control plan • Ensure that the dimensions of the output product are measured as per the process given in the work instructions • Demonstrate how to start the production process if test product matches the dimensions and quality of the final output. • Practise feeding the required plastic material in the apparatus for heaters to melt the plastic granules at the predefined temperature • Adjust the extruder speed and the extruder pressure to force the molten plastic into the die to create the desired output. • Practise turning valves of machines to regulate speed and quantity of the plastic coming out of the hopper • Manage feeding in line with the defined standards and specifications • Practise documenting the feeding observations like interrupted pouring or any abnormality • Ensure that proper functioning of screen pack and die for uniform melting of plastic and removal of the contaminants (if any) • Monitor the process (parameters like temperature, pressure, speed etc.) by observing and analyzing the readings on various panels/ meters • Analyze and observe any irregularity in the process and take preventive steps • Practise cleaning the die opening and die, changing the screen pack. • Manage code printing of the product with the identifying information and send the same for further processing	Chillers etc.

		• Check finish and pinch off of the product as per the desired geometric specifications • Evaluate the final plastic moulded product and compare the dimensions as prescribed in the work order/ job work • Ensure that the faulty parts are sent for further processing in terms of cutting, finishing etc. • Estimate the specifications of the finished products using devices like micrometers, vernier calipers, gauges, rulers, weighing scales, thickness gauge and any other inspection equipment • Compare the texture, surface properties, hardness and strength with the given product specifications • Document the observations of the basic inspection process • Identify pieces which are OK and the ones not meeting the specified standards • Discard the batches which are beyond repair and repair the ones which need minor modifications • Maintain records of each category of work output as per the batch etc. • Plan how to establish linkage between rejection of output and the pertinent causes for the same (process/ material etc.) • Revise minor defects like dimension variation, thickness variation etc., by control process parameters, etc. • Escalate all issues related to change in surface properties, tensile strength etc. • Assemble first and last output from each batch to the lab for quality check • Demonstrate ways to achieve clearance for the entire batch from the lab.	
8.	**Analyze the auxiliary equipment used in plastics processing**	• Inspect operating fuel systems, fuel oil transfer, supply lines and associated equipment • Operate condensate and feed	• Common hand tools like Vernier calliper, micrometer, drills, tapes and dies etc

	Theory Duration (hh.mm) 24:00 **Practical Duration** (hh.mm) 56:00 **Corresponding NOS Code** RSC/N4106 (CPC/N0416)	water systems, circulating and cooling water systems, condensate and makeup systems, circulating service water treatment equipment, auxiliary lube oil systems • Demonstrate the use of emission control equipment and miscellaneous equipment • Deliver onsite training programs • Demonstrate how to connect basic plant services to meet production requirements • Conduct initial checks of operating conditions before initiating production runs. • Assist in cleaning and lubrication of equipment and tooling • Perform various preventative maintenance tasks as needed • Analyze different types of pre-drier hot air oven, hopper driers, dehumidifiers etc. • Evaluate the basics of chiller, cooling tower for the controlling temperature of mould, machine and fluids. • Carry out basic operation and monitor gauges, dials, or other indicators to make sure a machine is working properly. • Analyze the compressor and scrap grinder. • Determine when and what kind of maintenance is needed and carry out routine maintenance of equipment • Practise equipment selection - determine the kind of tools and equipment needed to do a job. • Comply with the instructions given on the equipment • Comply with the relevant safety boards/ signs are placed on the shop floor • Ensure that waste is disposed off at the designated areas and manner of disposal is as per organization SOP.	• Plastics raw material like PP, HDPE, PET, PBT, PVC etc for training on machines of Blow grade from good/reputed supplier. • Basics machines for training like hand blow moulding, semiautomatic blow moulding, Automatic blow moulding, Automatic Hopper Loader, Hot air oven and Dryer, Dehumidifier, Mould Temperature Controller, Scrap Grinder, Crane, Air Compressor, Hot air blow Gun, Water cooling Tower, Hand Operated Blow Moulding M/C with accessories, Semi-Automatic Blow Moulding Machine, Fully Automatic Single stage Blow Moulding machine, Full Automatic Double stage Blow Moulding machine, Injection stretch Blow Moulding Machine • Pre drying system like Oven Drier, Hopper Drier, Dehumidifier, Chillers etc.
9.	**Advanced mould technology techniques for**	• Identify the mould material requirement, mould manufacturing	• Pen drives, computers etc for conduct of class.

	plastics blow moulding **Theory Duration** (hh:mm) 24:00 **Practical Duration** (hh:mm) 56:00 **Corresponding NOS Code** RSC/N4112 (CPC/N0425)	process and machineries. • Ensure that the dimensions, sizes, shapes and tolerances of machining component are as per specifications • Assemble information such as number of parts to make, engineered components and material to be used, and machines to be used • Define the range of materials and its effect on process and life of mould • Identify the operations that will be required for machining components based on design requirements • Compare the blow mould with the injection/rotational and merits and demerits • Analyze moulds for EBM, IBM, and SBM • Demonstrate how to manage the mould cooling systems: - pneumatic, water cooling • Evaluate the main components of moulds (die core, die cavity and screw neck) • Ensure that cavities preform mould is designed and developed as per SOP • Comply with the instructions given on the equipment manual, describing the operating process of the equipment	• Common hand tools like Vernier calliper, micrometer, drills, tapes and dies etc • Plastics raw material like PP, HDPE, PET, PBT, PVC etc for training on machines of Blow grade from good/reputed supplier. • Basics machines for training like hand blow moulding, semiautomatic blow moulding, Automatic blow moulding, Automatic Hopper Loader, Hot air oven and Dryer, Dehumidifier, Mould Temperature Controller, Scrap Grinder, Crane, Air Compressor, Hot air blow Gun, Water cooling Tower, Hand Operated Blow Moulding M/C with accessories, Semi-Automatic Blow Moulding Machine, Fully Automatic Single stage Blow Moulding machine, Full Automatic Double stage Blow Moulding machine, Injection stretch Blow Moulding Machine • Pre drying system like Oven Drier, Hopper Drier, Dehumidifier, Chillers etc.
10.	**Basic knowledge of computer skill** **Theory Duration** (hh.mm) 16:00 **Practical Duration** (hh.mm) 40:00	• Define fundamental of computers • Identify the components of computer: - hardware and the software • Practise how to accurately receive information and instructions from the supervisor/operator • Practise how to accurately pass on information to authorized persons • Assist others to maximize	• LCD Projector, White Board with marker and duster, charts etc • Pen drives, computers etc for conduct of class. • Common hand tools like Vernier calliper, micrometer, drills, tapes and dies etc

	Corresponding NOS Code RSC/N4108 (CPC/N0418)	effectiveness and efficiency	
11.	**Basic knowledge of communication/soft skills** **Theory Duration** (hh.mm) 20:00 **Practical Duration** (hh.mm) 62:00 **Corresponding NOS Code** RSC/N4108 (CPC/N0418)	• Display active listening skills while interacting with others at work • Apply appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism • Demonstrate responsible and disciplined behaviours at the workplace • Escalate grievances and problems to appropriate authority as per procedure to resolve them.	• LCD Projector, White Board with marker and duster, charts etc • Pen drives, computers etc for conduct of class.
12.	**Quality management system** **Theory Duration** (hh.mm) 20:00 **Practical Duration** (hh.mm) 56:00 **Corresponding NOS Code** RSC/N4113 (CPC/N0427)	• Evaluate the need of management in product quality. • Evaluate the concept of total quality management • Adhere to the Total Quality Management philosophy. • Discuss the need for quality system. • Comply with the total quality control tools-ISO, 5S, Six Sigma, OHSAS 18001 • Evaluate behavioural science • Differentiate between behavioural science and social science • Discuss the categories of behavioural science • Evaluate the theories of behavioural psychology, entrepreneurship development, preparing project report selecting a particular plastic product of their choice and submission.	• LCD Projector, White Board with marker and duster, charts etc • Pen drives, computers etc for conduct of class.
13.	**Maintain basic health and safety practices at the workplace** **Theory Duration** (hh:mm) 20:00	• Comply with environmental and safety policies of organisation • Identify personal safety, job safety and machine safety procedures • Coordinate with other resources at workplace to achieve the healthy environment • Identify any hazards like	• LCD Projector, White Board with marker and duster, charts etc • Pen drives, computers etc for conduct of class.

	Practical Duration (hh:mm) 56:00 **Corresponding NOS Code** RSC/N4101 (CPC/N0411)	accidents, fires or any other natural calamity and act appropriately • Demonstrate safe working practices while dealing with hazards • Practise good housekeeping standards at all times • Demonstrate rescue techniques applied during fire hazard • Demonstrate the correct use of a fire extinguisher. • Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise • Identify areas in the plant which are potentially hazardous / unhygienic in nature. • Conduct regular checks with support of the maintenance team on machine health to identify potential hazards due to wear and tear of machine. • Practise how to create awareness amongst others by sharing information on the identified risks. • Demonstrate the sorting process and check that the tools, fixtures and jigs that are lying on workstations are the ones in use and unnecessary items are not cluttering the workbenches or work surfaces. • Categorize the types of wastes • Demonstrate the technique of waste disposal and waste storage in proper bins as per SOP • Segregate the items which are labelled as red tag items for the process area and keep them in the correct places • Categorize the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers • Practise proper stacking of various types of boxes and containers as per the size/ utility to avoid any fall of items • Identify the floor markings/ area	

		markings used for demarcating the various sections in the plant • Practise proper labelling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents • Comply with the given instructions for labelling of fluids, oils, lubricants, solvents, chemicals etc. • Ensure proper storage of the materials to avoid spillage, leakage, fire etc.	
	Total Duration **Theory Duration** **288:00** **Practical Duration** **672:00**	**Unique Equipment Required:** **1. Class Room equipment:** LCD Projector/Screen, Computer, charts, Black / White board and duster. **2. Measuring equipment:** Steel Ruler, Micrometer, Vernier Caliper, Radius gauge, Feeler gage, Steel measuring tape, Weighing Balance (1 No.) **3. Hand Tools:** Hammer, screw driver set with Multiple heads, Allen key hexagonal, File triangular, Hacksaw, adjustable, Spanner set double side, Adjustable spanner **4. Personal Protective equipment:** Safety Goggles, Rubber Gloves, Asbestos gloves, Fire Extinguisher, Apron, Helmet, First Aid Box with Medicines **5. Plastics raw material:** PP, HDPE, Blow moulding grade. **6.** Mould: Hand mould, Blow Mould **7. Auxiliaries equipment:** Automatic Hopper Loader, Hot air oven and Dryer, Dehumidifier, Mould Temperature Controller, Scrap Grinder, Crane, Air Compressor, Hot air blow Gun, Water cooling Tower, Hand Operated Blow Moulding M/C with accessories, Semi-Automatic Blow Moulding Machine, Fully Automatic Single stage Blow Moulding machine, Full Automatic Double stage Blow Moulding machine, Injection stretch Blow Moulding Machine	

Grand Total Course Duration: **960 Hours 0 Minutes**

(This syllabus/ curriculum has been approved by ***Rubber Skill Development Council)***

Trainer Prerequisites for Job role: "Machine Operator – Plastic Blow Moulding" mapped to Qualification Pack: "RSC/Q4102 (CPC/Q0404)" Version 1.0

Sr. No.	Area	Details
1	**Description**	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack "RSC/Q4102 (CPC/Q0404), V 1.0".
2	**Personal Attributes**	A Trainer should be free from socio-economic preferences and prejudice. He/ she should be safety conscious and proficient in handling and use security/ safety equipment. Besides being knowledgeable, he/ she should be energetic, motivating, innovative and good at communication. The trainer should be able to establish rapport with the trainees and employ innovative methods to impart instructions.
3	**Minimum Educational Qualification**	VIIIth Standard
4a	**Domain Certification**	Certified for Job Role "Machine Operator – Plastic Blow Moulding" mapped to the Qualification Pack "RSC/Q4102 (CPC/Q0404), V 1.0" issued by RSDC. Minimum accepted score as per SSC guidelines is 80%.
4b	**Platform Certification**	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q2601" with scoring of minimum 80%.
5	**Experience**	As per the standards set by relevant SSC to practice in different industry sectors.

Annexure: Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES
Job Role: Machine Operator – Plastic Blow Moulding **Qualification Pack Code: RSC/Q4102 (CPC/Q0404), V 1.0** **Sector Skill Council: Rubber Skill Development Council**

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also laydown proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on these criteria.
5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS.
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessable outcome		Assessment Criteria for the Outcome		
NOS	Performance criteria	Total	Theory	Practical
1. RSC/N4101 (CPC/N0411) Maintain basic health and safety practices at the workplace, 5S.	PC1. Use protective clothing/equipment for specific tasks and work conditions	2.5	0.5	2
	PC2. Carry out safe working practices while dealing with hazards to ensure the safety of Self and others.	2.5	0.5	2
	PC3. Apply good housekeeping practices at all times	2.5	0.5	2
	PC4. Use the various appropriate fire extinguishers on different types of fires correctly	2.5	0.5	2
	PC5. Demonstrate rescue techniques applied during fire hazard, demonstrate good housekeeping in order to prevent fire hazards, demonstrate the correct use of a fire extinguisher.	2.5	0.5	2
	PC6. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise, and Identify areas in the plant which are potentially hazardous/ unhygienic in nature. Conduct regular checks with support of the maintenance team on machine health to identify potential hazards due to wear and tear of machine.	2.5	0.5	2
	PC7. Inform the concerned authorities on the potential risks identified in the processes, workplace area/ layout, materials used etc, Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations.	2.5	0.5	2
	PC8. Create awareness amongst other by sharing information on the identified risks.	2.5	0.5	2
	PC9. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and un- necessary items are not cluttering the workbenches or work surfaces.	2.5	0.5	2
	PC10. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions	2.5	0.5	2
	PC11. Follow the technique of waste disposal and waste storage in the proper bins as per SOP	1.5	0.5	1

	PC12. Segregate the items which are labelled as red tag items for the process area and keep them in the correct places	1.5	0.5	1
	PC13. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions	1.5	0.5	1
	PC14. Ensure that areas of material storage areas are not overflowing	1.5	0.5	1
	PC15. Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required	1.5	0.5	1
	PC16. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area	1.5	0.5	1
	PC17. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards.	1.5	0.5	1
	PC18. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards.	1.5	0.5	1
	PC19. Check that the items in the respective areas have been identified as broken or damaged	1.5	0.5	1
	PC20. Follow the given instructions and check for labelling of fluids, oils, lubricants, solvents, chemicals etc. and proper storage of the same to avoid spillage, leakage, fire etc. PC21. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions	1.5	0.5	1
	Sub total	**40**	**10**	**30**
2. RSC/N4109 (CPC/N0420) **Advanced method for fitting tools measuring equipment & practice.**	PC1. Comply with health and safety, environmental and other relevant regulations and guidelines at work.	5	2	3
	PC2. Adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing die fitting operations	5	2	3
	PC3. Work following laid down procedures and instructions	5	2	3
	PC4. Ensure work area is clean and safe from hazards	5	2	3

	PC6. Obtain job specification from a valid & approved source	5	2	3
	PC7. Read and understand job requirements from the job specification document properly	4	1	3
	PC8. Report & rectify incorrect information in job specification documents as per job requirement	4	1	3
	PC9. Preparation for the fitting operations as per procedure	4	1	3
	PC10. Ensure that all calibrated measuring instruments used.	4	1	3
	PC11. Ensure that the components used are free from foreign objects, dirt and corrosion	4	1	3
	PC12. Obtain correct work pieces and consumables as per job requirements	4	1	3
	PC13. Obtain appropriate tools and measuring instruments.	4	1	3
	PC14. Setting of work pieces as per job requirements using appropriate holding devices	4	1	3
	PC15. Marking specified features with the help of marking-out methods on the work pieces as per job specification by using appropriate measuring and marking tools.	4	1	3
	PC16. mark out templates for tracing/transferring the specified features on the work pieces as per drawing	4	1	3
	PC17. Tracing or transfer the specified features from the templates onto the work pieces as per drawing	2.5	0.5	2
	PC18. Perform fitting operations on various forms of metal components using a range of hand tools and manually operated machines	2.5	0.5	2
	PC19. Follow the specified machining sequence and procedure as per job specifications	2.5	0.5	2
	PC20. Check the machined components to ensure completeness of work	2.5	0.5	2
	PC21. Check the quality of the output as per required standards, using visual checks and measurement of dimensional parameters using measuring instruments.	2.5	0.5	2
	PC22. Produce components with various features as per standards applicable to	2.5	0.5	2

	the process.			
	PC23. Check the finished components as per job requirement	2.5	0.5	2
	PC24. Complete documentation during and post operations as per procedures	2.5	0.5	2
	PC25. Return all tools and equipment to the correct location on completion of the fitting activities	2.5	0.5	2
	PC26. Leave the work area in a safe and tidy condition on completion of job activities	2.5	0.5	2
	Sub total	**90**	**25**	**65**
3. RSC/N4110 (CPC/N0421) Introduction and test method for polymers and thermoplastic materials.	PC1. Basic Importance of polymers in Human Life.	3	1	2
	PC2. Study of fundamental terminology of polymers	3	1	2
	PC3. Classification of polymers- polymer structure & morphology, etc.	5	1	4
	PC4. Introduction to monomers and Polymers PC5. Polymerization	5	1	4
	PC6. Types of Polymerization- Condensation- Addition- Copolymerization	5	1	4
	PC7. Characterization	5	1	4
	PC8. Polymer Solution	6	2	4
	PC9. Measurement of Molecular weight and sizes-Structure and properties of Polymers.	6	2	4
	PC10. Commodity Polymers: Polyolefin: LDPE – HDPE – LLDPE, PP etc.	5	1	4
	PC11. Engineering Polymers: PC, ABS, PMMA, POM and PA- Nylon etc.	5	1	4
	PC12. Special Polymers: FEP, PVDF etc and PET material properties and its application in blow Moulding.	5	1	4
	PC13. Conventional Methods of Identification:- Drop Test, water floatation Test, Scratch test	5	1	4
	PC14. Advanced Methods of Identification:- MFI, Melting etc. and common acronyms in the plastics and commercial trade names.	2	1	1
	Sub total	**60**	**15**	**45**
4. RSC/N4104 (CPC/N0414) Basics of plastics processing methods	PC1. The need for plastics processing	3	1	2
	PC2. Ensure merits and demerits of Blow Moulding to over the all others plastic Process.	3	1	2
	PC3. Definition and terminology related to Plastic Processing.	3	1	2

	PC4. Ensure finishing operation including surface treatment of the fabricated product if required as per SOP.	4	1	3
	PC5. Primary Processing Methods as per company's SOP.	3	1	2
	PC6. Secondary Processing Methods as per company's SOP.	3	1	2
	PC7. Processing fundamentals	3	1	2
	PC8. The type of process to be used depends on a variety of factors, including product shape and size, plastic type, quantity to be produced, quality and accuracy (Tolerances) required, design load performance, cost limitation, and time schedule.	3	1	2
	PC9. Machine Operation Terminology: as per manual, semiautomatic, fully automatic.	5	1	4
	PC10. Type of Conversion Techniques: Injection, Blow, Compression, Transfer, Rotational and Other processes.	5	1	4
	PC11. Material to be processed	5	1	4
	PC12. Product design / configuration, Tolerance.	5	1	4
	PC13. Process Limitations	5	1	4
	PC14. Quality	5	1	4
	PC15. Cost / Performance balance.	5	1	4
	Sub total	**60**	**15**	**45**
5. RSC/N4111 (CPC/N0423) **Advanced blow moulding techniques for plastics processing and inspection of the finished products.**	PC1. Study of Principle of Blow Moulding process.	1.25	0.25	1
	• Plasticizing/ melting the resin	1.25	0.25	1
	• Parison or preform production	1.25	0.25	1
	• Blowing of parison	1.25	0.25	1
	• Ejection of the part and trim	1.25	0.25	1
	PC2. Basic Need of Tools and Accessories and Machineries.	1.25	0.25	1
	PC3. Understanding of Plastic Material for Blow Moulding- Commodity-Polyolefin's, Engineering-PET	1.5	0.5	1
	PC4. Various types of extrusion blow moulding Process.	1.5	0.5	1
	PC5. Continuous blow moulding process:- single head method, Twin station method, Rotary table system	1.5	0.5	1
	PC6. Intermitted blow moulding process:- Reciprocating screw extruder, Ram accumulator extrusion Accumulator head method	1.5	0.5	1

	PC4. Study of Extrusion blow moulding (EBM)	1.5	0.5	1
	PC5. Study of Injection blow moulding(IBM)	1.5	0.5	1
	PC6. Study of Injection Stretch blow moulding process (ISBM)	1.5	0.5	1
	PC7. Study of Extrusion Stretch Blow Moulding	1.5	0.5	1
	PC8. Various types of blow moulds-Side feed, Centre Feed, Spiral Mandrel, Extrusion Blow, stretch Blow, Injection Blow moulds etc.	1.5	0.5	1
	PC9. Setting of PET Injection moulding Machine operation , Load the material in the correct pattern as per SOP to minimize material overflow/ wastage/ excess flash	1.5	0.5	1
	PC10. Check the identified feed strip for dimension uniformity/identified granules	1.5	0.5	1
	PC11. Make the plastic compound or granule ready for feeding into the machine	1.5	0.5	1
	PC12. Start the machine and feeding simultaneously	1.5	0.5	1
	PC13. Ensure that moulding pressure and temperature is maintained during the process cycle	1.5	0.5	1
	PC14. Ensure mould lifting/ ejection/ slide mechanism of the press are properly functioning	1.5	0.5	1
	PC15. Manufacturing the preform as per SOP	1.5	0.5	1
	PC16. Remove the Manufacturing the preform from the mould as per SOP.	1.5	0.5	1
	PC17. Check for operation of moulding apparatus like hopper, heaters, extruder, blow moulding die/mould, screen pack etc. as per the checklist provided	1.5	0.5	1
	PC18. Fix the desired die/mould to the blow moulding machine apparatus in order to achieve the desired operation as per the Work Instructions/ SOPs	1.5	0.5	1
	PC19. Make modifications in the process parameters (by selecting the right program from the machine control system) if required and ensure alignment with the prescribed standards	1.5	0.5	1
	PC20. Use weighing machines to measure the quantity of granules and ensure that the correct quantity of granules are put in the hopper	1.5	0.5	1

	PC21. Check the parameters – Temperature, pressure, current, extruder speed etc. in line with the work instructions/ SOPs	1.5	0.5	1
	PC22. Setup the apparatus as per the selected process and the moulding standards used in the processing industry	1.5	0.5	1
	PC23. Adjust the temperature and other parameters of the moulding apparatus as per the values given in Work Instructions/ SOPs	1.5	0.5	1
	PC24. Ensure availability of the coolant and working of valves to circulate the coolant to cool and solidify plastic	1.5	0.5	1
	PC25. Ensure the functionality and assembly of die as per SOP.	1.5	0.5	1
	PC26. Adjust the Parison controlling and program the parison with the help of parison programming tools and software as per requirement.	1.5	0.5	1
	PC27. Die shaping in blow moulding.	1.5	0.5	1
	PC28. Study the types of mandrel used in blow moulding.-Divergent and convergent.	1.5	0.5	1
	PC29. Study of Blow Ratio, parison swell, Die Swell, Types of Parison Blowing system:-Pneumatic and ejection system	1.5	0.5	1
	PC30. Understand the moulding procedure & process to be adopted for completing the work order from the supervisor by referring the Work Instruction document/ SOP manual	1.5	0.5	1
	PC31. Set the various moulding parameters like temperature of heaters, back pressure/ air pressure/ vacuum pressure, screw speed of the extruder, regulating current, flow of coolant/ water etc. before starting the process. Process parameters are mentioned in the Work Instructions/ SOP manual	1.5	0.5	1
	PC32. Understand raw material like plastics granules, fillers, bonding additives grades etc. required for executing the activity	1.5	0.5	1
	PC33. Ensure that the required material is procured from the store before starting the process	1.5	0.5	1
	PC34. Understand the type of Die required for executing the required operation and ensure that the same is available for operations	2.5	0.5	2

	PC35. Understand the number of heaters required for the extruder assembly, heater temperature and current required for the heating operations as mentioned in the Work Instructions/ SOP manual. Ensure housekeeping safety in the moulding area. Use lifting equipment or for lift/trolley for mould/material. Keep all safety requirements.	2.5	0.5	2
	PC36. Preheating of plastic granules to improve their tensile strength	2.5	0.5	2
	PC37. Ensure that the plastic granules are mixed with additives (if any) before being fed into the hopper	2.5	0.5	2
	PC38. Turn valves of machines to regulate screw speed and quantity of the plastic coming out of the hopper	2.5	0.5	2
	PC39. Ensure pouring in line with the defined standards and specifications	2.5	0.5	2
	PC40. Record the feeding observations like interrupted pouring or any abnormality	2.5	0.5	2
	• In case extrusion blow moulding.	2.5	0.5	2
	• In case of Injection Blow Moulding.	2.5	0.5	2
	• In case of Injection Blow Moulding	2.5	0.5	2
	• Optimization of Process Parameters.	2.5	0.5	2
	PC41. Conduct a test process and produce a sample output as per the sketches/ engineering drawing shared with the supervisor.	2.5	0.5	2
	PC42. Check the hollow articles (bottles, container) for geometry, material & dimensional parameters as per the Control Plan before starting the production.	2.5	0.5	2
	PC43. Ensure that the dimensions of the output product are measured as per the process given in the Work Instructions/ SOP. In case the test product matches the dimensions and quality of the final output, start the production process	2.5	0.5	2
	PC44. Feed the required operation code in the apparatus for heaters to melt the plastic granules at the predefined temperature	2.5	0.5	2
	PC45. Adjust the extruder speed and the extruder pressure to force the molten plastic into the die to create the desired output.	2.5	0.5	2
	PC46. Turn valves of machines to regulate speed and quantity of the plastic	2.5	0.5	2

	coming out of the hopper			
	PC47. Ensure feeding in line with the defined standards and specifications	2.5	0.5	2
	PC48. Record the feeding observations like interrupted pouring or any abnormality	2.5	0.5	2
	PC49. Ensure the proper functioning of screen pack and die for uniform melting of plastic and removal of the contaminants (if any)	2.5	0.5	2
	PC50. Monitor the process (parameters like temperature, pressure, speed etc.) by observing and analyzing the readings on various panels/ meters to prevent machine breakdown and deviations of the output from desired specifications	2.5	0.5	2
	PC51. Observe and analyze any irregularity in the process and take preventive steps	2.5	0.5	2
	PC52. Clean the die opening & die; changing the screen pack.	2.5	0.5	2
	PC53. Ensure code printing of the product with the identifying information (wherever required) and send the same for further processing	2.5	0.5	2
	PC54. Instruct the helper to neck finishing and pinch off of the product as per the desired geometric specifications. (doesn't required for IBM)	2.5	0.5	2
	PC55. Measure the final plastic moulded product and compare the dimensions as prescribed in the work order/ engineering drawing	2.5	0.5	2
	PC56. In case the parts are not as per the given measurements, send the same for further processing in terms of cutting, finishing etc.	2.5	0.5	2
	PC57. Measure the specifications of the finished products using devices like micrometers, Vernier calipers, gauges, rulers, weighing scales, Thickness Gauge and any other inspection equipment and compare with the parameters given in the work order.	2.5	0.5	2
	PC58. Compare texture, surface properties, hardness and strength with the given product specifications	1.5	0.5	1
	PC59. Note down the observations of the basic inspection process and Identify pieces which are OK and also not meeting the specified standards	1.25	0.25	1
	PC60. Discard the batch which are beyond repair and repair the ones which need	1.25	0.25	1

	minor modifications in settings.			
	PC61. Maintain records of each category of work outputs as per the batch etc. so that correction can be organized.	1.25	0.25	1
	PC62. Establish linkage between rejection of output and the pertinent causes for the same (process/ material etc.); Recommend the means for rejection control.	1.25	0.25	1
	PC64. Rectify minor defects like dimension variation, thickness variation etc. by control process parameters etc.	1.25	0.25	1
	PC65. Escalate all issues related to change in surface properties, Tensile strength etc. so that the manufacturing equipment can be reset to achieve the specified output	1.25	0.25	1
	PC66. Provide first and last output from each batch to the lab for quality check on its composition, properties etc.	1.25	0.25	1
	PC67. Obtain clearance for the entire batch from the lab	1.25	0.25	1
	Sub total	**140**	**35**	**105**
6. RSC/N4106 (CPC/N0416) Auxiliary equipment in plastics processing.	PC1. Some duties include: Inspecting, monitoring, operating fuel systems, fuel oil transfer & supply lines & associated equipment and fossil fuel chillers.	1.5	0.5	1
	PC2. Operating condensate & feed water systems, circulating & cooling water systems, condensate & makeup systems, circulating service water treatment equipment, auxiliary lube oil systems, emission control equipment and miscellaneous equipment. Pass onsite training programs. Follow safety rules, regulations and procedures.	1.5	0.5	1
	PC3. Connects basic plant services as needed to meet production requirements and makes initial checks of operating conditions before initiating production runs.	1.5	0.5	1
	PC4. Connects basic plant services as needed to meet production requirements and makes initial checks of operating conditions before initiating production runs.	1.5	0.5	1
	PC5. Basic Knowledge of different types of Predrier-Hot air Oven, Hopper Driers, Dehumidifiers etc.	1.5	0.5	1
	PC6. Basic Knowledge of Chiller, Cooling Tower for the controlling temperature of	2.5	0.5	2

	Mould, machine and Fluids.			
	PC7. Basic Knowledge of Operation and Monitoring -- Watching gauges, dials, or other indicators to make sure a machine is working properly.	2.5	0.5	2
	PC8. Basic Knowledge of Compressor and Scrap Grinder.	2.5	0.5	2
	PC9. Understand Equipment Maintenance -- Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.	2.5	0.5	2
	PC10. Understand Equipment Maintenance -- Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.	2.5	0.5	2
	PC11. Understand & Follow the instructions given on the equipment manual describing the operating process of the equipment	2.5	0.5	2
	PC12. Follow the Safety, Health and Environment related practices developed by the organization	2.5	0.5	2
	PC13. Ensure relevant safety board's/ signs are placed on the shop floor	2.5	0.5	2
	PC14. Operate the machine using the recommended Personal Protective Equipment (PPE) and ensure team members also use the related PPEs at the workplace	2.5	0.5	2
	PC15. Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc.	2.5	0.5	2
	PC16. Attend all safety and fire drills to be self-aware of safety hazards and preventive techniques	2.5	0.5	2
	PC17. Maintain high standards of personal hygiene at the work place	2	1	1
	PC18. Ensure that the waste disposal is done in the designated area and manner as per organization SOP.	3	1	2
	Sub total	**40**	**10**	**30**
7. RSC/N4112 (CPC/N0425) Advanced Mould technology techniques for plastics	PC1. Basic Study of Mould Material requirement, Mould Manufacturing Process and machineries.	8	2	6
	PC2. Compute dimensions, sizes, shapes and tolerances of machining component are as per specifications and as per company procedures	8	2	6

processing.	PC3. Determine information such as number of parts to make, engineered components and material to be used, and machines to be used	8	2	6
	PC4. Identify and confirm resources required such as components, machinery, range of materials and processes	8	2	6
	PC5. Study of range of Materials and how its effect on process and life of mould: Ferrous metals: e.g. Carbon steels, stainless steels, cast iron, tool steel, hard metals; Non-ferrous alloys	8	2	6
	PC6. Identify the operations that will be required for machining components based on design requirements	8	2	6
	PC7. Identify type of equipment required for machining components based on the operations selected.	8	2	6
	PC8. Comparison of Blow Mould with the Injection rotational merits and demerits for overcome the above process mould.	8	2	6
	PC9. Construction and study Mould for EBM, IBM, and SBM.	8	2	6
	PC10. Mould cooling systems:-Pneumatic, water cooling	4.5	0.5	4
	PC11. Basic Study of The main components of moulds (Die Core, Die Cavity And Screw Neck) are made by injection process, which are made of special mould steel.	4.5	0.5	4
	PC12. Cavities Preform Mould, designed and developed as per SOP	4.5	0.5	4
	PC13. Follow the instructions given on the equipment manual describing the operating process of the equipment	4.5	0.5	4
	Sub total	**90**	**20**	**70**
8. RSC/N4108 (CPC/N0418) Basic Knowledge of communication/soft skills.	PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	4	1	3
	PC2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt	4	1	3
	PC3. Give information to others clearly, at a pace and in a manner that helps them to understand	4	1	3
	PC4. Display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible	4	1	3

	PC5. Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks	4	1	3
	PC6. Display appropriate communication etiquette while working	4	1	3
	PC7. Display active listening skills while interacting with others at work	4	1	3
	PC8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism	4	1	3
	PC9. Demonstrate responsible and disciplined behaviors at the workplace	4	1	3
	PC10. Escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict	4	1	3
	Sub total	**40**	**10**	**30**
9. RSC/N4113 (CPC/N0427) Quality Management systems.	PC1. Study and understand of Total Quality Control	4	1	3
	PC2. Need of Management of Product Quality.	4	1	3
	PC3. Understand the Concept of Total Quality Management.	4	1	3
	PC4. Understanding the TQM Philosophy.	4	1	3
	PC5. Understanding the need for Quality system.	4	1	3
	PC6. Study & understand of Total Quality control tools-ISO, 5S, Six Sigma, OHSAS 18001	4	1	3
	PC.7 Study and understand of Behavioral Science.	4	1	3
	PC8. Different between Behavioral Science and Social Science.	4	1	3
	PC9. Categories of Behavioral Science.	4	1	3
	PC10. Theories of Behavioral Psychology, Entrepreneurship development, preparing project report selecting a particular plastic product of their choice and submission.	4	1	3
	Sub total	**40**	**10**	**30**
	Total	**600**	**150**	**450**