

Syllabus for Silk Screen Printing Operator

Course Name	SILK SCREEN PRINTING OPERATOR, V2
Course Code	STC - HAC /2021/1503, V2
Level	3
Occupation	Silk Screen Printing Operator
Job Description	The Silk Screen Printing operator selects various types of solutions and mixes them in right proportion to create design on the screen based on the pattern need to be imposed on the final object.
Course Duration	Total Duration 390 Hrs (T-90, P-180, OJT-60 and ES-60)
Trainees' Entry Qualification	Grade 10 OR Grade 8 with two year of (NTC/ NAC) after 8 th OR Grade 8 pass and pursuing continuous schooling in regular school with vocational subject OR 8th grade pass with 2 yrs relevant experience OR Previous relevant Qualification of NSQF Level 2 with one yr experience OR Previous relevant Qualification of NSQF Level 2.5 with 6 months experience
Trainers Qualification	<ol style="list-style-type: none"> 1. B.Tec in Printing Technology with 3 year of experience 2. ITI in relevant trade with 5 year experience 3. Diploma in Printing Technology with 5 year of experience

Structure of Course:

Module No.	Outcome	Theory (Hrs)	Practical (Hrs)	OJT (Hrs)	Total (Hrs) [Multiple of 30]
1	Communicate with supervisor	10	20		30
2	Arrange the required raw materials and ingredients	10	20		30
3	Mix the ingredients and oxides to obtain the desired design colour pattern.	10	20		30
4	Check colour quality and colour productivity standards	10	20		30
5	Demonstrate the silk screen printing process	10	20		30
6	Carry out reporting and documentation	10	20		30

7	Ensure workplace safety and security SOPs	10	20		30
8	Carry adequate waste management	10	20		30
9	Maintain practices for Personal Hygiene at workplace	10	20		30
10	OJT			60	60
11	Employability Skill	60			60
	TOTAL	150	180	60	390

Employability Skill: 60Hrs (Provided by NCVET)

OJT: 60 hours (in multiple of 60)

SYLLABUS:

Module No. 1: Communicate with supervisor

Outcome: Communicate with supervisor

Theory Content:

- Explain standard procedures to be followed while receiving the job order and instructions from reporting supervisor
- Explain standard operating procedures to be followed to resolve doubts on design, usage of material & tools, quality & standards compliance, etc. to team members at workplace
- Identify the ways to enhance the level of empathy across genders while giving assistance to colleagues at the workplace
- Discuss the importance of preparing the records based on standard organizational parameters in order to achieve production as per the periodic schedules

Practical Content:

- Apply the standard operating procedures in order to analyze the job specifications based on the parameters based on size, shape, pattern and art work design
- Demonstrate the washing process as per standard procedures in order to make the fabric dust and dirt free for further processing
- Perform visual inspection process in order to check the fabric is dried completely based on standard parameters
- Perform the standard operating procedures while marking the layout in order to meet the desired design specifications

Tools & Equipment needed:

Module No. 2: Arrange the required raw materials and ingredients

Outcome: Arrange the required raw materials and ingredients

Theory Content:

- Describe the process of handling clean material, tool and equipment at workplace
- Explain the importance of preparing the list of raw materials and ingredients in prescribed quantities to achieve the desired colour solution
- Discuss the importance of marking/coding/ labelling/ numbering while maintaining reports and records

Practical Content:

- Demonstrate usage of tools and equipment for further processing

- Perform standard operating procedures to be followed while collecting raw materials and ingredients in prescribed quantities from the designated storage location
- Demonstrate the organizational SOPs required to place the raw materials and ingredients at workplace for further processing
- Apply the standard procedures to be followed while delivering the remaining and unused material at the designated storage location
- Choose the suitable PPE based on the prescribed Job Sheet at the workplace

Tools & Equipment needed:

Module No. 3 Mix the ingredients and oxides to obtain the desired design colour pattern.

Outcome: Mix the ingredients and oxides to obtain the desired design colour pattern.

Theory Content:

- Describe the importance of using PPE at the time of handling tools and equipment at workplace
- Identify the parameters required for inspection process in the prepared colour solution to check the quality and density

Practical Content:

- Follow standard operating procedures to monitor the functioning of exposure unit based on time duration, pressure, volume, and colour formulation density
- Demonstrate the process of mixing the raw materials and ingredients in the container of prescribed volume and size
- Examine the overall functioning of exposure unit from setting up for the prescribed operation and turn off after regular interval of time
- Demonstrate the standard operating procedures to be followed while removing or unloading the colour formulation from the container
- Prepare a sample format /template to collect information during inspection
- Based on colour viscosity, oxide granules, nature of hue and colour saturation range
- Ensure that work area and tools are cleaned and inspected according to workplace procedures

Module No. 4 Check colour quality and colour productivity standards.

Outcome: Check colour quality and colour productivity standards.

Theory Content:

- Explain how to monitor the workplace and work processes for potential risks and threats
- Discuss the parameters that indicate deviation in the prepared colour solution based on pre heating radiations and post heating radiations
- Explain the standard organizational parameters that are followed to examine the colour productivity standards

Practical Content:

- Demonstrate the SOPs that are required to check the prepared solution during the process based on its colour saturation properties
- Carry adequate safety measures while handling materials, chemicals, and tools
- Perform the standard thermal procedures to examine the exposure unit temperature based on the results as per the job sheet
- Prepare the sample template that indicate all the standard results achieved during this operation
- Review the periodic schedules based on that productions rate can be evaluated after the regular interval of time as per SOP.

- Demonstrate the process of proper labelling mechanism of instruments/ boxes/ containers and maintaining reference files/documents with the codes and the lists

Module No. 5: Demonstrate the silk screen printing process.

Outcome: Demonstrate the silk screen printing process.

Theory Content:

- Explain the importance of selecting the frame as per standard parameters such as material, pattern, size and dimensions based on design specifications
- Discuss the schedule of working with supervisor prior to perform silk screen printing operation
- Discuss the repetition of the process to achieved uniform results on the object
- Discuss the importance of using gloves as per the materials used for making handicraft to avoid blisters; scratches and cuts

Practical Content:

- Follow the SOP while placing the frame and screen at the work station for further processing
- Demonstrate the process of apply the emulsion across the mesh as per the prescribed quantity and design specifications
- Ensure that the screen is placed on the top side on design is placed in a closed vacuum surface
- Follow SOPs while placing the weight of appropriate volume on the frame in order to provide additional strength
- Perform the emulsion process by UV exposure unit as per the standard safety procedures
- Examine the edges of the frame are tightly taped to prevent from moisture and leakage
- Demonstrate the process of placing the ink as per the prescribed quantity on the screen
- Perform the squeezing with squeezing blade helps to spread the ink over the mesh and the design is imprinted
- Repeat the same steps to obtained the multiple copies of the design colour pattern

Module No. 6: Carry out reporting and documentation.

Outcome: Carry out reporting and documentation.

Theory Content:

- Identify the parameters required for the inspection process in printing manufacturing unit
- List the different quality parameters to be checked in the silk screen printing operation
- List the parameters to be included while maintaining a master record book

Practical Content:

- Apply standard operating procedures to prepare periodic working schedules based on the current market preference
- Describe the importance of implementing innovations/ new ideas and processes within organizational standards
- Maintain and follow the periodic schedule of servicing of machines, tools and equipment to reduce the maintenance and enhance the capacity at the workplace
- Prepare a sample format /template to collect information during inspection based on the operational parameters that required in making the final product
- Perform the SOPs to carry the servicing and maintenance records of tools and equipment and machines

Module No. 7 Ensure workplace safety and security SOPs

Outcome: Ensure workplace safety and security SOPs

Theory Content:

- Describe the health and safety related instructions applicable to the workplace

- Explain how to monitor the workplace and work processes for potential risks and threats
- Discuss workplace hygiene, sanitation and job specific safety procedures
- Explain how to speak and behave in a calm way while dealing with accidents and emergencies
- Follow organization procedures for evacuation when required
- Comply with health, safety and security related instructions applicable to the workplace

Practical Content:

- demonstrate how to clean and maintain the cleanliness of the work area using approved sanitizers to keep it free from dust, waste, and spillage
- carry adequate safety measures while handling materials, chemicals, and tools
- apply standard operating procedures to clean the tools and equipment used with recommended sanitizers following specifications and organizational standards
- report any accidents, incidents or problems without delay to the supervisor and take necessary immediate
- participate actively in employee work groups on 5s and encourage team members for active participation
- follow environment management system related procedures
- monitor the workplace and work processes for potential risks and threats
- take action based on instructions in the event of fire, emergencies or accidents
- participate mock drills/evacuation procedures based on organizational standards and procedures in case of an emergency
- follow organization procedures for evacuation when required

Module No. 8: Carry adequate waste management

Outcome: Carry adequate waste management

Theory Content:

- Describe the importance of disposing waste in the designated area at workplace
- List the important preventive measures in order to preserve the resources at workplace
- Discuss the safety measures to be followed while handling and moving waste and debris

Practical Content:

- Demonstrate the SOPs while disposing the used PPEs and other aids at designated locations
- Perform the SOPs to segregate the waste and debris in selected colour bins
- Apply the SOPs while segregating the recycled and non-recycled waste and debris
- Demonstrate the standard sanitization protocols with alcohol based disinfectants at the designated location where waste are disposed at regular interval of time

Module No.9: Maintain practices for Personal Hygiene at workplace

Outcome: Maintain practices for Personal Hygiene at workplace

Theory Content:

- Explain the importance of organizing cyclic sessions at the workplace to create awareness on the usage of appropriate health-related equipment in case of any emergency
- Identify common types of injuries that might occur and affect the participant's at the workplace emergencies at work
- Identify basic health concerns like fever, cold & cough, etc. for self, colleague and other family members
- Discuss the importance of using a dust mask at the workplace to prevent mouth and nose from dust particles and dangerous bacteria

Practical Content:

- Discuss the importance of using gloves as per the materials used for working printing operations to avoid blisters; scratches and cuts

- Demonstrate different ways in case of an emergency at home and use of emergency helpline numbers etc.
- Follow SOPs at workplace related to health and hygiene such as social distancing, sanitization and cleanliness
- Apply the SOPs to organize the preventive health check-ups at regular interval of time
- Demonstrate the appropriate SOPs required to clean the work place, tools and equipment, machines, uniforms etc. at regular interval of time in order to avoid any injury or infection

Learning Outcome – Assessment Criteria

Outcomes to be assessed/NOSs to be assessed	Assessment criteria for the outcome
1. Communicate with supervisor	<ul style="list-style-type: none"> • Receive the job order and instructions from supervisor as per the SOP • Coordinate with supervisor to seek clarification on design, production, maintenance and repair schedules at • Assess the problems effectively and report if required to supervisor appropriately • Convey to colleagues and line workers for appropriate work techniques and methods • Plan and prioritize sequence of activities, work schedules and volume of production in coordination with • Deliver timely the inspection reports of tools and equipment to supervisor as per SOP
2. Arrange the required raw materials and ingredients	<ul style="list-style-type: none"> • List the raw materials and ingredients required for preparing the colour solution • Arrange tools and equipment for processing the screen printing • Examine the properties of frame with mesh based on the emulsion and design patterns • Collect the required raw materials and ingredients from the store as per the prescribed quantities and labeling • Place all the collected raw materials and ingredients at the work place • Deliver the remaining raw material and ingredients at designated location as per the SOP with proper labelling that ensures traceability and identification

<p>3. Mix the ingredients and oxides to obtain the desired design colour pattern.</p>	<ul style="list-style-type: none"> • Select the PPE required to handle the tools and equipment • Monitor the functioning of exposure unit to make stencils using UV light sensitive emulsion on the screen • Mix the raw materials and ingredients in the container of prescribed volume and size • Perform mixing operation as per the SOP to ensure appropriate colour formation is being achieved • Examine the prepared colour composition based on color viscosity, oxides granules, nature of hue, and color saturation range • Maintain and examine the overall functioning of the UV unit as per the standard operating procedures. • Turn off the exposure unit at the right interval of time • Remove the prepared colour formulation from the container. • Clean tools and equipment after their use to prevent colour spots, stains and rust.
<p>4. Check colour quality and colour productivity standards</p>	<ul style="list-style-type: none"> • Compare the colour as per the colour quality standards during pre-heating or post heating operations • Maintain records of inspection results and tests as per prescribed job sheet • Review the periodical targets set by the supervisor
<p>5. Demonstrate the silk screen printing process</p>	<ul style="list-style-type: none"> • Select the frame material based on the design pattern and specifications • Place frame and screen in an appropriate manner for further processing • Apply the SOPs to spread the emulsion across the mesh • Ensure that the screen is placed on the top side on design is placed in a closed vacuum surface • Place the weight of appropriate quantity to give additional strength for further processing • Perform the emulsion process through exposure unit • Ensure that edges of the frame are properly taped to avoid moisture and leakage • Attach the screen to print bench and the material to be printed on bottom of the screen • Apply good quantity of ink required to spread across the screen • Perform the squeezing with squeezing blade helps to spread the ink over the mesh and the design is Imprinted • Perform the same steps to obtained the multiple copies of the design colour patterns

<p>6. Carry out reporting and documentation</p>	<ul style="list-style-type: none"> • Maintain documentation including periodic working • Ensure that documents are available for all the appropriate authorities for inspection • Enhance productivity by adopting several appropriate measures like automation, motivation, process planning, resource planning etc. • Ensure that work area and tools are cleaned and inspected according to workplace procedures • Prepare sample report carrying all the working schedules and day to day activities
<p>7. Ensure workplace safety and security SOPs</p>	<ul style="list-style-type: none"> • Outline the health, safety and security policies at workplace to avoid workplace for potential risks and threats • Follow adequate safety standards while handling materials, chemicals, tools, and electrical equipment • Sanitize hands at regular intervals using hand wash & alcohol-based sanitizers • Clean the workplace using sanitizers and keep it free from dust, waste and spillage • Ensure that personal protective equipment is available at the workplace at all time • Follow first procedures during emergencies situations at the workplace • Practice the appropriate measures to make yourself in a calm way while dealing with accidents, emergencies and in illness, fires or any other natural calamity
<p>8. Carry adequate waste management</p>	<ul style="list-style-type: none"> • Employ standard procedures of waste disposal and waste storage in the proper containers as per SOP • Place the used PPEs in a designated bag, sealed and labelled as contagious waste • Segregate the recycled and non-recycled wastes as per SOP
<p>9. Maintain practices for Personal Hygiene at workplace</p>	<ul style="list-style-type: none"> • Take appropriate health and hygiene procedures at the workplace to avoid injuries and health issues • Maintain social distancing in social gatherings at the workplace • Use mask at the workplace to prevent mouth and nose from dust particles and dangerous bacteria • Identify health concerns like fever, cold & cough, etc. for self, colleague and other family members • Report any flu-like symptoms, fever, diarrhoea, sore throat, constant sneezing, coughing, runny nose and vomiting to the supervisor • Undergo preventive health check-ups at regular intervals as per the SOP

List of Tools & Equipment			
Silk Screen Printing Operator CLASS - VIII (for Batch of 30 Candidates)			
S No.	Name of the Tools and Equipment	Specification	Quantity
A. THEORY / CLASS ROOM			
1	Instructor's table with glass top	6 feet x 4 feet	1Nos.
2	Revolving Chair for Classroom		1Nos.
3	Instructor's revolving with arm chair		2Nos.
4	Visitor's chair		2Nos.
5.	Class room chairs (armless)		30 Nos.
6.	Class room table single / Dual desk		30 /15 Nos.
7.	Almirah steel (major)	6" / higher	02 Nos.
8.	Steel Cupboard	180 x 90 x 45 cm	02 Nos.
9.	Steel Cupboard	120 x 60 x 45 cm	02 Nos.
10.	Book Shelf with lock		02 Nos.
11	Magnetic White Board	6' x 4'	2Nos.
12	Working table size	1250x950	2nos
13	Students Lockers	with 8 compartments	4Nos.
14.	Wooden Chest of Drawers		5Nos.
15	First Aid Box		01 No.
16	Fire Extinguisher		01 No.
17	Wall Clock		01 No.
B. TRAINEES TOOL KIT			
18	Rule Steel	300 mm both in inch and mm	31 Nos.
19	Rule Wooden 4 fold	600 mm	31 Nos.
20	Frame with Mesh (screen)	35x35mm (Mesh 15-420)	2 Nos.
21	Emulsion	1 Ltr.	5 Nos.
22	Gelatin	1 Kg	7 Nos.
23	Exposure Unit	500x600 mm	1 Nos.
24	Drying Rack	20" X 30	5 Nos.
25	Spatulas	150mm	10 Nos.
26	Colour Powders	200-300 gm	5 Nos.
27	Weigh Machine	upto 100 kg	1 Nos.
28	Scrub Brushes	6"*6"	5 Nos.
29	Ink Solvents	5 Ltr	5 Nos.
30	Thinner	5 Ltr	1 Nos.
31	Duct Tape	150-160 NR	5 Nos.
32	Containers	20 Ltrs	3 Nos.
33	Screen Printing Table	15 x 20"	1 Nos.
34	Squeegees	13"	5 Nos.
35	Cotton fabric	200-300 Mtr	5 Nos.
36	Binder	8 1/2" x 11"	2 Nos.

37	Acid dyes	metal complex dyes	5 Nos.
38	Plastisol ink	30 – 38 mesh	5 Nos.
39	Water	30-40 Ltr	2 Nos.

Note: -

1. All the tools and equipment are to be procured as per BIS specification.

Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr marks	Total OJT marks
Communicate with supervisor	HAC/1503/OC1	10	70	0
Arrange the required raw materials and ingredients	HAC/1503/OC2	20	70	0
Mix the ingredients and oxides to obtain the desired design colour pattern.	HAC/1503/OC3	20	80	0
Check colour quality and colour productivity standards	HAC/1503/OC4	20	80	0
Demonstrate the silk screen printing process	HAC/1503/OC5	20	70	0
Carry out reporting and documentation	HAC/1503/OC6	20	70	0
Ensure workplace safety and security SOPs	HAC/1503/OC7	10	70	0
Carry adequate waste management	HAC/1503/OC8	20	70	0
Maintain practices for Personal Hygiene at workplace	HAC/1503/OC9	10	70	0
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	HAC/1503/OC10	0	0	150
Employability Skills – 60 Hrs	DGT/VSQ/N0102	50	0	0