



Model Curriculum

Laboratory Technician Physical

SECTOR: IRON & STEEL
SUB-SECTOR: STEEL

OCCUPATION: Product Quality Control
REF ID: ISC/Q0801
NSQF LEVEL: 3



  

Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the
INDIAN IRON AND STEEL SECTOR SKILL COUNCIL
for the
MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: **Laboratory Technician Physical** QP No. ISC/Q0801 NSQF Level 3

Date of Issuance: **December 22nd, 2015**
Valid up to: **December 21st, 2016**

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


Authorised Signatory
(Indian Iron and Steel Sector Skill Council)



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LABORATORY TECHNICIAN PHYSICAL

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Laboratory Technician Physical”, in the “Iron & Steel” Sector/Industry and aims at building the following key competencies amongst the learner.

Program Name	Laboratory Technician Physical		
Qualification Pack Name & Reference ID.	Laboratory Technician Physical ISC/Q0801		
Version No.	1.0	Version Update Date	25-03-2015
Pre-requisites to Training	Minimum qualification – B.Sc (with Physics as a subject) Pass / Dip.in Engineering (Mechanical/Electrical) Pass		
Training Outcomes	After completing this programme, participants will be able to: <ul style="list-style-type: none"> • Prepare the test sample, conduct physical tests and upload the results in logbook/system • Preserve and/or dispose-off the samples after physical test and calibrate the equipment at scheduled frequency • Use basic health and safety practices at workplace • Work effectively with others 		

This course encompasses 4 out of 4 National Occupational Standards (NOS) of “Laboratory Technician Physical” Qualification Pack issued by “Indian Iron & Steel Sector Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	Over view of Iron & Steel Industry Theory Duration (hh:mm) 04:00 Practical Duration (hh:mm) 00:00 Corresponding NOS Code	<ul style="list-style-type: none"> • Understanding Iron & steel industry • Understanding types of Iron & Steel Industry • Understanding products of Iron & Steel industry • Activities in Iron & Steel Industry 	PPTs of Iron and steel manufacturing, Charts showing the same
2	Occupational, Health and Safety (OHAS) Theory Duration (hh:mm) 08:00 Practical Duration (hh:mm)	<ul style="list-style-type: none"> • Understanding the Occupational health & Safety • Understand What is hazard • Documentation for Health and safety • Working at Heights, confined spaces • Remedies for fire at work place 	PPTs for OHAS related to Job Role, Display Material for PPEs related to Job Role, Safety Material



Sr. No.	Module	Key Learning Outcomes	Equipment Required
	12:00 Corresponding NOS Code ISC/N0008		
3	5S & House keeping Theory Duration (hh:mm) 08:00 Practical Duration (hh:mm) 16:00 Corresponding NOS Code ISC/N0004	<ul style="list-style-type: none"> • Identification of bottlenecks in functioning of work place • Various methods of housekeeping both pre-work & post-work as well 	PPTs of 5S, Display Charts of 5S, Audit Checklists of 5S
4	Prepare the test sample, conduct physical tests and upload the results in logbook/system Theory Duration (hh:mm) 35:00 Practical Duration (hh:mm) 105:00 Corresponding NOS Code ISC/N0803	<ul style="list-style-type: none"> • Prepare steel samples for testing various physical properties of steel • Conduct tests on the prepared samples according to the relevant SPI • Upload the results into logbook and/or system through computer 	PPTs for various types of drawings, Universal Testing Machine, Microscopes, Impact tester, V-notch testing machine, Ultra-sound testing equipment, Hardness testing machine, Bend-testing machine, Electric oven Grinder, Hand Shear, Milling machine, Profile cutter
5	Preserve and/or dispose-off the samples after physical test and calibrate the equipment at scheduled frequency Duration (hh:mm) 30:00 Practical Duration (hh:mm) 110:00 Corresponding NOS Code ISC/N0804	<ul style="list-style-type: none"> • Collect used samples from the equipment and either preserve them for the scheduled period, or dispose them following the SOP • Periodically calibrate the equipment in the physical laboratory at a defined frequency following the supplier's manual and also the SPI for the same 	Universal Testing Machine, Microscopes, Impact tester, V-notch testing machine, Ultra-sound testing equipment, Hardness testing machine, Bend-testing machine, Electric oven Grinder, Hand Shear, Milling machine, Profile cutter



Sr. No.	Module	Key Learning Outcomes	Equipment Required
6	<p>Use basic health and safety practices at the workplace</p> <p>Duration (hh:mm) 12:00</p> <p>Practical Duration (hh:mm) 20:00</p> <p>Corresponding NOS Code ISC/N0008</p>	<ul style="list-style-type: none"> Health and safety procedures Fire safety procedures Emergencies, rescue and first aid procedures 	<p>PPE, Different Type of Safety Sign, First Aid Box, Safety instrument and clothing, Step Ladder, Sample Accident reports ,Fire Extinguishers, Items required for fire extinguisher and fire Safety</p>
7	<p>Work effectively with others</p> <p>Duration (hh:mm) 12:00</p> <p>Practical Duration (hh:mm) 18:00</p> <p>Corresponding NOS Code ISC/N0009</p>	<ul style="list-style-type: none"> Ensure appropriate communication with superiors, peers and others as applicable at work place Demonstrate appropriate behaviour and etiquette at work place 	<p>Communication skills PPTs, Posters Team management posters</p>
	<p>Total Duration</p> <p>Theory Duration 109:00</p> <p>Practical Duration 281:00</p>	<p>Unique Equipment Required:</p> <ul style="list-style-type: none"> Mechanical Drawings, Blueprints, Basic Tools and Equipment's, measuring tools& precision measurement tools, Assembling tools Material and Equipment for cleaning, lifting machines PPE, Safety Sign, First Aid Box, Fire Extinguishers 	

Grand Total Course Duration: **390Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by [Indian Iron and Steel Sector Skills Council](#))



Trainer Prerequisites for Job role: “Laboratory Technician Physical” mapped to Qualification Pack: “ISC/Q0202”

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “ISC/Q0202”.
2	Personal Attributes	Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organised and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	Minimum Educational Qualifications	Min. ITI Fitter pass and preferably CTI/ATI cleared/ Diploma Mechanical
4a	Domain Certification	Certified for Job Role: “Laboratory Technician Physical” mapped to QP: “ISC/Q0202”. Minimum accepted score is 80%
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “SSC/1402”. Minimum accepted score is 80%
5	Experience	Min. 5 years industry experience and minimum 2 years’ experience as Trained or un trained for same Job Role/ Trade



Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Laboratory Technician Physical
Qualification Pack	ISC/Q0202
Sector Skill Council	Indian Iron & Steel Sector Skill Council

Sr. No.	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 lay down 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 60% 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	Total Marks 1000	Out Of	Marks Allocated	
				Theory	Practical
ISC/N0803: Prepare the test sample, conduct physical tests and upload the results in logbook/system	PC1. Understand the different testing procedure & relevant standards based on nature of the physical tests that need to be carried out	550	21	20	1
	PC2. Cut the sample to the required profile using the right tools e.g. Knives, metalworking and multipurpose drill bits, broaches, countersinks, cutting burrs, cutting tool holders, debarring cutters, hole saws. Industrial drill bits, slotting cutter, blades etc.		99	10	89



	PC3. Operate the relevant equipment (Universal Testing Machine, Microscopes, Impact tester, V-notch testing machine, Ultra-sound testing equipment, Hardness testing machine, Bend-testing machine, Electric oven Grinder, Hand Shear, Milling machine, Profile cutter etc.) and conduct the test as per SPI		150	20	130
	PC4. Ensure to carry out following tests as required: <ul style="list-style-type: none"> • Hardness • Property tests (YS, UTS, EI%, r-bar etc.) • Bend test • Roughness of surface • Coating thickness measurement • Draw ability test • Cupping test • Micro-structure • Inclusion rating 		250	50	200
	PC5. Record the results into logbook and/or the system through computer		20	0	20
	PC6. Share the test result with the respective departments with observations		10	0	10
		Total	550	100	450
ISC/N0804: Preserve and/or dispose-off the samples after physical test and calibrate the equipment at scheduled frequency	PC1. Segregate the preserving and disposing testing materials post conducting the tests as per requirement	200	10	0	10
	PC2. Follow the set standards (in SOP) to preserved the samples with necessary tagging in designated places		30	10	20
	PC3. Discard the samples in the bins identified for rejected metallic samples		10	0	10
	PC4. Take necessary precautions for disposing the testing materials as per nature and characteristics for safe disposal		20	0	20
	PC5. Understand and follow the steps outlined in the SOP for each equipment that needs manual calibration (excluding those which are auto-calibrated)		40	10	30
	PC6. Understand the calibration methods of each testing equipment as captured in the equipment manual		40	10	30



	PC7. Ensure the calibration of the testing equipment as per set frequency		30	0	30
	PC8. Inform the reporting senior in case of equipment damaged or abnormal calibration test record		10	0	10
	PC9. Coordinate with the concerned departments for repairing/replacement of faulty testing equipment		10	0	10
		Total	200	30	170
ISC/N0008: Use basic health and safety practices at the workplace	PC1. Use protective clothing/equipment for specific tasks and work conditions	150	10	5	5
	PC2. State the name and location of people responsible for health and safety in the workplace		5	0	5
	PC3. State the names and location of documents that refer to health and safety in the workplace		1	0	1
	PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace		9	5	4
	PC5. Carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role		10	5	5
	PC6. State location of general health and safety equipment in the workplace		5	0	5
	PC7. Inspect for faults, set up and safely use steps and ladders in general use		5	0	5
	PC8. Work safely in and around trenches, elevated places and confined areas		5	0	5
	PC9. Lift heavy objects safely using correct procedures		5	0	5
	PC10. Apply good housekeeping practices at all times		1	0	1
	PC11. Identify common hazard signs displayed in various areas		6	5	1
	PC12. Retrieve and/or point out documents that refer to health and safety in the workplace		4	0	4
	PC13. Use the various appropriate fire extinguishers on different types of fires correctly		9	5	4



	PC14. Demonstrate rescue techniques applied during fire hazard		10	5	5
	PC15. Demonstrate good housekeeping in order to prevent fire hazards		1	0	1
	PC16. Demonstrate the correct use of a fire extinguisher		4	0	4
	PC17. Demonstrate how to free a person from electrocution		5	0	5
	PC18. Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.		10	5	5
	PC19. Demonstrate basic techniques of bandaging		5	0	5
	PC20. Respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		10	5	5
	PC21. Perform and organize loss minimization or rescue activity during an accident in real or simulated environments		5	0	5
	PC22. Administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases		5	0	5
	PC23. Demonstrate the artificial respiration and the CPR Process		5	0	5
	PC24. Participate in emergency procedures		4	0	4
	PC25. Complete a written accident/incident report or dictate a report to another person, and send report to person responsible		10	5	5
	PC26. Demonstrate correct method to move injured people and others during an emergency		1	0	1
		Total	150	45	105
ISC/N0009: Work effectively with others	PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	100	10	5	5



PC2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	5	5	
PC3. Provide information to others clearly, at a pace and in a manner that helps them to understand		10	0	10	
PC4. Display helpful behaviour by assisting others in performing tasks in a positive manner, where required and possible		10	5	5	
PC5. Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	5	5	
PC6. Display appropriate communication etiquette while working		10	0	10	
PC7. Display active listening skills while interacting with others at work		10	0	10	
PC8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	5	5	
PC9. Demonstrate responsible and disciplined behaviours at the workplace		15	5	10	
PC10. Escalate grievances and problems to supervisor		5	0	5	
	NOS Total Marks	Total	100	30	70
	Grand Total		1000	310	590
	Percentage Weightage:			60%	60%
	Minimum Pass% to qualify (aggregate):			60%	