



# Model Curriculum

## Cast House Senior Operator

**SECTOR: IRON & STEEL**  
**SUB-SECTOR: STEEL**

**OCCUPATION: IRON MAKING**  
**REF ID: ISC/Q0407**  
**NSQF LEVEL: 4**



  

# 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: 'Cast House Senior Operator' QP No. 'ISC/Q0407 NSQF Level 4'

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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# Cast House Senior Operator

## CURRICULUM / SYLLABUS

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

<b>Program Name</b>	<b>Cast House Senior Operator</b>		
<b>Qualification Pack Name &amp; Reference ID.</b>	<b>Cast House Senior Operator ISC/Q0407</b>		
<b>Version No.</b>	1.0	<b>Version Update Date</b>	01-04-2017
<b>Pre-requisites to Training</b>	Minimum qualification – 10th Pass		
<b>Training Outcomes</b>	<b>After completing this programme, participants will be able to:</b> <ul style="list-style-type: none"> <li>• Understand the assigned job for cast house preparation and operation</li> <li>• Understand the operational practice of blast furnace stoves</li> <li>• Understand the operational practice of stock house</li> <li>• Use basic health and safety practices at the workplace</li> <li>• Work effectively with others</li> </ul>		

This course encompasses 5 out of 5 National Occupational Standards (NOS) of “Cast House Senior Operator” Qualification Pack issued by “Indian Iron & Steel Sector Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<b>Over view of Iron &amp; Steel Industry</b>  <b>Theory Duration</b> (hh:mm) 04:00 <b>Practical Duration</b> (hh:mm) 00:00  <b>Corresponding NOS Code</b>	<ul style="list-style-type: none"> <li>• Understanding Iron &amp; steel industry</li> <li>• Understanding types of Iron &amp; Steel Industry</li> <li>• Understanding products of Iron &amp; Steel industry</li> <li>• Activities in Iron &amp; Steel Industry</li> </ul>	PPTs of Iron and steel manufacturing, Charts showing the same
2	<b>Occupational, Health and Safety (OHAS)</b>  <b>Theory Duration</b> (hh:mm) 08:00 <b>Practical Duration</b> (hh:mm) 12:00	<ul style="list-style-type: none"> <li>• Understanding the Occupational health &amp; Safety</li> <li>• Understand What is hazard</li> <li>• Documentation for Health and safety</li> <li>• Working at Heights, confined spaces</li> <li>• Remedies for fire at work place</li> </ul>	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
	<b>Corresponding NOS Code</b> ISC/N0008		
3	<b>5S &amp; House keeping</b>  <b>Theory Duration</b> (hh:mm) 08:00  <b>Practical Duration</b> (hh:mm) 12:00  <b>Corresponding NOS Code</b> ISC/N0008	<ul style="list-style-type: none"> <li>• Identification of bottlenecks in functioning of work place</li> <li>• Various methods of housekeeping both pre-work &amp; post-work as well</li> </ul>	PPTs of 5S, Display Charts of 5S, Audit Checklists of 5S
4	<b>Understand the assigned job for cast house preparation and operation</b>  <b>Theory Duration</b> (hh:mm) 25:00  <b>Practical Duration</b> (hh:mm) 70:00  <b>Corresponding NOS Code</b> ISC/N0424	<ul style="list-style-type: none"> <li>• Understand the job/operations, processes including cast house accessories before cast</li> <li>• Open the tap hole for casting along with all necessary preparation</li> <li>• Maintain smooth casting to run steady operation of blast furnace</li> </ul>	PPTs for various types of drawings, Hand tools and machines, various measuring instruments, hot and cold blast valve, blowers, chimney valves, control and measuring instruments and automatic regulators, mud gun, tap hole drill machine, overhead crane
5	<b>Understand the operational practice of blast furnace stoves</b>  <b>Duration</b> (hh:mm) 30:00  <b>Practical Duration</b> (hh:mm) 80:00  <b>Corresponding NOS Code</b> ISC/N0425	<ul style="list-style-type: none"> <li>• Ensure steady operation of blast furnace stoves</li> <li>• Ensure functioning of all blast furnace stove valves</li> <li>• Maintain heating schedule of blast furnace stoves</li> </ul>	Hot and cold blast valve, blowers, chimney valves, control and measuring instruments and automatic regulators, mud gun, tap hole drill machine, overhead crane
6	<b>Understand the operational practice of stock house</b>  <b>Duration</b> (hh:mm) 35:00	<ul style="list-style-type: none"> <li>• Ensure steady operation of stock house charging system</li> <li>• Maintain steady stock level in the blast furnace</li> <li>• Regulate proper charge sequence for utilization of thermal and chemical</li> </ul>	Hot and cold blast valve, blowers, chimney valves, control and measuring instruments and automatic

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	<p><b>Practical Duration</b> (hh:mm) 90:00</p> <p><b>Corresponding NOS Code</b> ISC/N0426</p>	energies	regulators, mud gun, tap hole drill machine, overhead crane
7	<p><b>Use basic health and safety practices at the workplace</b></p> <p><b>Duration</b> (hh:mm) 08:00</p> <p><b>Practical Duration</b> (hh:mm) 08:00</p> <p><b>Corresponding NOS Code</b> ISC/N0008</p>	<ul style="list-style-type: none"> <li>Health and safety procedures</li> <li>Fire safety procedures</li> <li>Emergencies, rescue and first aid procedures</li> </ul>	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
8	<p><b>Work effectively with others</b></p> <p><b>Duration</b> (hh:mm) 08:00</p> <p><b>Practical Duration</b> (hh:mm) 12:00</p> <p><b>Corresponding NOS Code</b> ISC/N0009</p>	<ul style="list-style-type: none"> <li>Ensure appropriate communication with superiors, peers and others as applicable at work place</li> <li>Demonstrate appropriate behaviour and etiquette at work place</li> </ul>	Communication skills PPTs, Posters Team management posters
	<p><b>Total Duration</b></p> <p><b>Theory Duration</b> <b>126:00</b></p> <p><b>Practical Duration</b> <b>284:00</b></p>	<p><b>Unique Equipment Required:</b></p> <ul style="list-style-type: none"> <li>Mechanical Drawings, Blueprints,</li> <li>Basic Tools and Equipment's,</li> <li>measuring tools&amp; precision measurement tools,</li> <li>Lubricant and coolant</li> <li>Material and Equipment for cleaning, lifting machines</li> <li>PPE, Safety Sign, First Aid Box, Fire Extinguishers</li> </ul>	

Grand Total Course Duration: **410Hours, 0 Minutes**

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

**Trainer Prerequisites for Job role: “Cast House Senior Operator”  
mapped to Qualification Pack: “ISC/Q0407”**



Sr. No.	Area	Details
1	<b>Description</b>	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “ISC/Q0407”.
2	<b>Personal Attributes</b>	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	<b>Minimum Educational Qualifications</b>	Min. ITI pass and preferably CTI/ATI cleared/ Diploma Mechanical
4a	<b>Domain Certification</b>	Certified for Job Role: “ <u>Cast House Senior Operator</u> ” mapped to QP: “ISC/Q0407”. Minimum accepted score is 80%
4b	<b>Platform Certification</b>	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “SSC/1402”. Minimum accepted score is 80%
5	<b>Experience</b>	Min. 5 years industry experience and minimum 2 years’ experience as Trained or un trained for same Job Role/ Trade



## Annexure: Assessment Criteria

<b>Assessment Criteria</b>	
<b>Job Role</b>	<b>Cast House Senior Operator</b>
<b>Qualification Pack</b>	<b>ISC/Q0407</b>
<b>Sector Skill Council</b>	<b>Indian Iron &amp; Steel Sector Skill Council</b>

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.

Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
<b>ISC/N0424: Understand the assigned job for cast house preparation and operation</b>	PC1. Interpret the log book report for the previous shift	<b>300</b>	20	10	10
	PC2. Ensure the cleanliness of the cast house including hot metal and slag runners including: <ul style="list-style-type: none"> <li>• Tap hole maintenance</li> <li>• Trough preparation (desirable and non-desirable)</li> <li>• Metal runner preparation</li> <li>• Slag runner preparation</li> <li>• Diamond crossing preparation</li> <li>• Spout jam removal</li> </ul>		25	5	20





Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC3. Plan as appropriate to carry out the casting schedule as per Standard Operating Procedure (SOP) e.g. making hook, clay spoon dally etc.		30	10	20
	PC4. Ensure proper operation of cast house equipment (mud gun, tap hole drill machine, overhead crane etc.) including mud gun cleaning/filling and EOT crane operation (remote or pendant)		25	5	20
	PC5. Ensure disposing the scrap and debris as per standard practice including housekeeping		20	5	15
	PC6. Ensure the tap hole is ready for opening the cast		25	5	20
	PC7. Ensure that the hot metal ladle, cast house granulation plant is ready / slag ladles are ready for opening the cast		30	10	20
	PC8. Open the cast with the help of tap hole drill machine		25	5	20
	PC9. Ensure casting schedule and practices		25	5	20
	PC10. Ensure closing the tap hole properly with the help of mud gun after finishing of cast including trough discharge, discharge hole cleaning and closing, discharge runner preparation etc.		25	5	20
	PC11. Ensure lancing of tap hole and tuyer during shutdown and break down		25	5	20
	PC12. Carry out tuyer muddling and cleaning during shutdown		25	5	20
	<b>NOS Total Marks</b>	<b>Total</b>	<b>300</b>	<b>75</b>	<b>225</b>



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
<b>ISC/N0425: Understand the operational practice of blast furnace stoves</b>	PC1. Ensure to maintain the temperature and blast pressure steady for smooth operation of blast furnace	<b>250</b>	35	10	25
	PC2. Ensure supply of blast furnace gas steadily for stove heating		35	10	25
	PC3. Ensure steady air pressure and volume is available from the blower		35	10	25
	PC4. Ensure proper functioning of all stove valves e.g. hot blast, cold blast, chimney valves, control/ measuring instruments and automatic regulators		40	10	30
	PC5. Ensure stove changing as per norms (one and half hour on blast, three hours on gas)		35	5	30
	PC6. Ensure blast furnace gas is properly clean with respect to dust and moisture		35	10	25
	PC7. Ensure proper ratio of blast gas and air for combustion		35	5	30
	<b>NOS Total Marks</b>	<b>Total</b>	<b>250</b>	<b>60</b>	<b>190</b>
<b>ISC/N0426: Understand the operational practice of stock house</b>	PC1. Ensure steady operation of skip car, scale car and stock level at the bunker	<b>200</b>	40	10	30
	PC2. Ensure charging through conveyor system steadily		40	10	30
	PC3. Ensure steady stock level as per furnace operating condition		40	10	30
	PC4. Ensure proper sequence of charge mix e.g. Coke-Coke-Ore-Ore-Stone (C-C-O-O-S) depending on the temperature and peripheral gas pressure		40	10	30



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	PC5. Ensure CO <sub>2</sub> contain in blast furnace gas along the radius and centre of the furnace is same or 1-2% less		40	10	30
	<b>NOS Total Marks</b>	<b>Total</b>	<b>200</b>	<b>50</b>	<b>150</b>
<b>ISC/N0008: Use basic health and safety practices at the workplace</b>	PC1. Use protective clothing/equipment for specific tasks and work conditions	<b>150</b>	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



Assessment outcome (nos)	Assessment criteria	Total marks	Marks allocation		
			Out of	Theory	Skills practical
	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



Assessment outcome (nos)	Assessment criteria	Total marks	Marks allocation		
			Out of	Theory	Skills practical
	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		5	0	5
	PC25. Complete a written accident/incident report or dictate a report to another person, and send report to person responsible		9	5	4
	PC26. Demonstrate correct method to move injured people and others during an emergency		1	0	1
	<b>NOS Total Marks</b>	<b>Total</b>	<b>150</b>	<b>45</b>	<b>105</b>
<b>ISC/N0009: Work effectively with others</b>	PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	<b>100</b>	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 behavior by assisting others in performing tasks in a positive manner, where required and possible		10	5	5



Assessment outcome (nos)	Assessment criteria	Total marks	Out of	Marks allocation	
				Theory	Skills practical
	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 behaviors at the workplace		15	5	10
	PC10. Escalate grievances and problems to		5	0	5
	<b>NOS Total Marks</b>	<b>Total</b>	<b>100</b>	<b>30</b>	<b>70</b>
	<b>Grand Total</b>	<b>1000</b>	<b>1000</b>	<b>260</b>	<b>740</b>
	<b>Percentage Weightage:</b>			<b>50%</b>	<b>50%</b>
	<b>Minimum Pass% to qualify (aggregate):</b>			<b>60%</b>	