Syllabus for Rigger

Course Name	Rigger
Sector	Capital Goods
Course Code	CGM/2023/RIGG-RPL/261
Level	RPL LEVEL 3
Occupation	Rigger in Iron & Steel Industry
Job Description	The job role is responsible for Conducting rigging tasks like hook and wire handling, using tools, operating chain blocks and jacks for lifting, building scaffolding, handling various slings and ropes, calculating load weights, operating cranes with proper signals, and performing practical activities like knot tying, load lifting, scaffolding construction, and tackle the repair.
Course Duration	Total Duration 80 Hrs (T-22, P-58)
Trainees' Entry Qualification	Grade 8 with more than 5 Year Experience in the relevant Field
Trainers Qualification	Degree or Diploma in Mechanical Engineering with 1 yr experience in relevant field OR ITI in relevant trade with 3 yr experience in relevant field

Structure of Course:

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs)
1.	Workplace Safety	Apply safe working practices in the industry	5	11	1**6**
2.	Basic Engineering Drawing	Practice & interpret technical drawings	2	6	8
3	Iron & Steel Industry & Role of Riggers	Explore Activities in Iron & Steel Industry and role of Riggers in it	6	4	10
4.	Rigging work in Iron & Steel Industry	Demonstrate the procedure of rigging gear identification, hitch selection, visual inspection based on capacity SOP, hook loading/removal, and sling tension calculation for off-level pick points.	5	25	3**0**
5	Housekeeping	Maintain a clean and organized workspace before and after tasks, employing techniques for effective housekeeping	2	8	1**0**
6	Employability Skill		2	4	6
		TOTAL:	22	58	80

SYLLABUS:

Module No. 1: Workplace Safety

Outcome: Apply safe working practices in the industry

Theory Content:

1. Awareness of safety norms.
2. Safety-PPE usage and its benefits
3. Fire prevention and personal safety.
4. Ergonomic safety and health principles.
5. Use various PPE while working.
6. Safety during machine / material handling
7. Protocols for preventing fires in the workplace.
8. Evaluation of PPE effectiveness in simulated rigging tasks.
9. Recognition and interpretation of safety signage in the workplace.
10. Safe usage of step ladders in rigging tasks, including set-up and climbing techniques.

Practical Content:

1. Accident prevention and safety regulations while material handling, eliminating unsafe conditions, unsafe actions, discovering causes of accidents.
2. Fire prevention and personal safety.
3. Safety during machine handling.
4. Emergencies, rescue and first aid procedures relevant to rigging situations.
5. Familiar with Personal protective Equipment's and clothes Different Type of Safety Sign, First Aid Box, Safety instrument and clothing
6. Case studies and scenarios for hands-on risk assessment exercises.
7. Simulation of preventive measures and their implementation.
8. Hands-on training with fire extinguishers and firefighting equipment.
9. Emergency response scenarios for practical firefighting exercises.
10. Simulated rescue drills for various rigging-related emergencies.
11. Practical exercises in identifying and understanding the meaning of safety signs.
12. Designing and implementing effective safety signage in a practical setting.
13. Hands-on experience with instruments such as gas detectors and safety alarms.
14. Hands-on scenarios in safely conducting rigging tasks at elevated locations.
15. Analysis of sample accident reports related to rigging activities.
16. Practical exercises in reporting incidents and near misses.

Tools & Equipment needed:

Protective clothing (aprons, gloves), eye and hearing protection, respiratory gear, steel-toed boots, hard hats, welding helmets, ventilation systems, first aid kits, PPE, fire safety equipment, and organizational tools like anvil stands.

Module No. 2: Basic Engineering Drawing

Outcome: Practice & interpret technical drawings

Theory Content:

- Introduction of technical drawing and lettering

- Use and care drawing boards and different drawing instruments, Drawing sheets and their sizes.
- Explain Types of Lines: Horizontal, Vertical, Inclined, parallel lines.
- Concept of using Scales in Drawing – Enlarging, Full Size & Reducing Scale.

Practical Content:

Introduction of technical drawing and lettering

- How to begin a drawing – Layout of drawing sheet.
- Drawing of — i) Horizontal lines, ii) Vertical lines, iii) Inclined lines, iv) Parallel lines,
- Single stroke lettering by conventional method.
- Dimensioning—System of Dimensioning

Geometrical Construction

- Geometrical construction of Polygons (Pentagon, Hexagon & Octagon) by general method.

Orthographic Projection of Line & Lamina

- Projector; Plane of projection – Vertical Plane, Horizontal Plane & Profile Plane. Concept of 1st angle
- Projection; 3rd angle Projection. Reference Line – Symbol of methods of projection. (Demonstration with models).
- Projection of Points, Lines & Lamina (Square, rectangular, triangular, hexagonal, pentagonal and circular) parallel to VP and angle with HP & vice versa.

Freehand Sketch

Introduction – Necessity.

b) Free hand sketches of rolled steel sections – i) T-section, ii) I-section, iii) Angle section, iv) Channel section, v) Circular section, vi) Rectangular Section, vii) Steel flat, viii) Double ended wrench, ix) Screw driver, x) Nail puller

Tools & Equipment needed: Drawing instrument box, Drawing instrument box, Set square celluloid 30°-60°, French-curves (set of 12 celluloid), T-Square or Mini drafter, Drawing board.

Module No. 3: Iron & Steel Industry & Role of Riggers

Outcome: Explore Activities in Iron & Steel Industry and role of Riggers in it

Theory Content:

1. Overview of the iron and steel industry's historical development.
2. Significance and impact of the industry on global and local economies.
3. Exploration of key processes, including smelting, refining, and casting.
4. Role of various materials and technologies in steel production
5. Different production methods: blast furnace, electric arc furnace, and direct reduction.
6. Common steel products and their applications in various industries
7. Different types of steel alloys and their uses
8. Overview of forging, rolling, and extrusion processes in creating steel products.
9. Understanding the organizational structure and roles of different personnel in Iron & Steel Industry.
10. Role of riggers in facilitating smooth operations within the industry.
11. Identifying bottlenecks in the functioning of a workplace.
12. Application of rigging techniques in real-world scenarios.

Practical Content:

1. Exploration of day-to-day activities within the iron and steel industry.
2. Hands-on problem-solving exercises related to common workplace challenges.
3. Simulation of various rigging tasks with increasing complexity.
4. Visits to iron and steel plants for firsthand experience of day-to-day activities.

Tools & Equipment needed:

Models or diagrams demonstrating smelting, refining, and casting processes.
Samples of raw materials and finished steel products.
Models or virtual simulations of blast furnaces, electric arc furnaces, and direct reduction processes.
Models or videos demonstrating forging, rolling, and extrusion processes in creating steel products.

Module No. 4: Rigging work in Iron & Steel Industry

Outcome:
Demonstrate the procedure of rigging gear identification, hitch selection, visual inspection based on capacity SOP, hook loading/removal, and sling tension calculation for off-level pick points.

Theory Content:

1. Application/Rigging method. Clamping de-clamping of hooks. Clamping de-clamping of wire ropes. Clamping de-clamping of wire slings.
2. Knowledge of different tools and tackles used in rigging
3. Chain block and its application.
4. Different type of jacks, chain block, and pull lift.
5. Knowledge of different types of scaffolding
6. Types of sling, Construction of manila and steel rope
7. Application of sling on irregular shape load. Material movement by using different rigging tools and technique.
8. Application of sling at different angel.
9. Types of derrick, use of derrick
10. Types of winch, application of winch
11. Calculation and estimation of weight of load
12. Crane hand signal for EOT crane and mobile crane.

Practical Content:

1. Identification of tools and tackles
2. Practice of various knots (reef, emergency, kadam, two half, bow line, etc
3. Lifting load using chain block
4. Lifting load using jacks
5. Making portable scaffolding. Ascending and descending on scaffolding.
6. Shifting a motor or gear box.
7. Repairing and checking tackle before use.
8. Lifting load using derrick

9. Shifting load using winch
10. Find out weight of load.
11. Measuring diameter of sling to find out its capacity
12. Use of different legs of sling
13. Use of appropriate signal while using crane

Tools & Equipment needed:

1. Rigging Hooks.
2. Chain Pulleys, Blocks and tackle
3. Sheave Blocks
4. Lever blocks
5. Shackles
6. Eye Bolts
7. Steel Nuts
8. Wire Ropes and Accessories
9. Synthetic Lifting Slings
10. Winches
11. Mechanical hoists
12. Trolleys
13. Safety Kits for Riggers

Module No. 5: Housekeeping

Outcome: Maintain a clean and organized workspace before and after tasks, employing techniques for effective housekeeping.

Theory Content:

Importance of maintaining a clean and organized workspace before commencing work.
Techniques and practices for maintaining a clean and safe environment after completing tasks.
Understanding assigned rigging jobs based on provided checklists and instructions.
Discuss the importance of categorization of wastes into recyclable, non-recyclable and hazardous waste.
State the importance of using appropriate color dustbins for different types of waste.
Discuss the common sources of pollution and ways to minimize it.
Explain the importance of cleaning and storing the equipment as per SOP.

Practical Content:

Practical demonstrations and exercises in pre-work housekeeping.
Hands-on post-work housekeeping exercises.
Perform basic checks to identify any spills and leaks and that need to be plugged /stopped.
Apply different disposal techniques depending upon different types of waste.
Show how to sanitize and disinfect one's work area regularly.
Demonstrate warning labels, symbols and other related signages.

Tools & Equipment needed:
Educational videos or presentations on best practices in housekeeping, Printed or digital resources on waste categorization and disposal techniques, color-coded bins, Brooms, mops, brushes, and cleaning agents, Safety gloves, safety glasses, Warning labels, symbols, and other related signages for interpretation exercises,

Module No. 6: Employability Skills

Detail Content

- **Basic English Skills**

1. Converse using basic English sentences.

2. How to Greet others
3. Read and interpret text written in basic English
4. Write a short note/paragraph / letter using basic English

- **Communication Skills**

1. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
2. Discuss the significance of working collaboratively with others in a team

- **Financial Skills**

1. Outline the importance of selecting the right financial institution, product and service
2. Demonstrate how to carry out offline and online financial transactions, safely and securely like net banking, wallet payment, UPI.
3. List the common components of salary and compute income, expenditure, taxes, investments etc.

- **Essential Digital Skills**

1. Familiarization of working with computer
2. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
3. Send email with attachment. Receive email and download attachment

- **Customer Service Skills**

1. Explain the significance of identifying customer needs and responding to them in a professional manner.
2. Discuss the significance of maintaining hygiene and dressing appropriately

Learning Outcome – Assessment Criteria

Module No.	Outcome	Assessment Criteria
1	Apply working safety practices in the Industry	**After completion of this module students will be able to:** 1.1 Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements. 1.2 Identify basic first aid and use them under different circumstances. 1.3 Identify different fire extinguisher and use the same as per requirement. 1.4 Identify safety alarms accurately 1.5 Follow about General safety precaution in industry with Rigging Work 1.6 Recognize and interpret of safety signage in the workplace. 1.7 Use safely step ladders in rigging tasks, including set-up and climbing techniques. 1.8 Identify safety sign
2	Practice & interpret technical drawings	**After completion of this module students will be able to:** 2.1 Draw plane figures applying drawing instruments with proper layout and folding of drawing sheets. 2.2 Construct Line, Lettering, Dimensioning, and Scale – Plain,

Module No.	Outcome	Assessment Criteria
		Diagonal 2.3 Draw plan, elevation, side view of different objects with appropriate type of lines and dimensions as per standard convention. 2.4 Draw simple geometrical figure like square, rectangle, circle using CAD.
3	Explore Activities in Iron & Steel Industry and role of Riggers in it	**After completion of this module students will be able to:** 3.1 Explain the processes involved in smelting, refining, and casting in the production of steel. 3.2 Classify common steel products and describe their applications in various industries. 3.3 Classify different types of steel alloys and explain their specific uses. 3.4 Describe the forging, rolling, and extrusion processes in creating steel products. 3.5 Explain the role of riggers in facilitating smooth operations within the industry.
4	Demonstrate the procedure of rigging gear identification, hitch selection, visual inspection based on capacity SOP, hook loading/removal, and sling tension calculation for off-level pick points.	**After completion of this module students will be able to:** 4.1. Interpret basic rigging terms, rigging gear identification and be able to determine the best hitch and rigging gear necessary for lifting various types of loads. 4.2. Do inspection of tackles capacity wise standard operating practice (SOP) 4.3 Determine proper hook loading and the removal criteria for the rigging equipment used within their facility 4.4 Explain techniques and formulas to estimate the weight of a load and load's center of gravity. 4.5 Dismantling and assembling of load lifting accessories- jack, pulley block, chain block, sheave block, pull lift, snatch block 4.6 Recognize proper crane and rigging procedures as they relate to taglines, signaling, and avoidance of pinch points resulting in immediate risk to personnel. 4.7 Recognize and understand the elements which can contribute to a rigging accident. 4.8 Determine the transfer of weight during different methods of load turning. 4.9 Determine load to winches, jacks, rollers, and floors during special load handling activities which require moving the load horizontally. 4.10 Determine the load to rigging blocks and the mechanical advantage necessary to move a load vertically or horizontally. 4.11 Work at height by using safety appliances.
5	Maintain a clean and organized workspace before and after tasks, employing techniques for effective housekeeping	**After completion of this module students will be able to:** 5.1 Categorize wastes into recyclable, non-recyclable, and hazardous waste. 5.2 Use appropriate color dustbins for different types of waste. 5.3 Identify common sources of pollution and propose effective ways to minimize it. 5.4 Interpret warning labels, symbols, and other related signages. 5.5 Identify and address challenges related to housekeeping in a

Module No.	Outcome	Assessment Criteria
		practical setting.
6	Employability Skill	**As per guided curriculum**

List of Tools, Equipment & materials needed for 30 Trainees (Practical)

Sl No	Items Name	Specification	Qty (Nos.)
1	Hammer		10
2	Spanner		10
3	Trolleys		1
4	Mechanical hoists		1
5	Rule steel with metric graduation also	12 cm	10
6	Rigging Hooks.		5
7	Chain Pulleys, Blocks and tackle		1
8	Sheave Blocks		1
9	Lever blocks		1
10	Shackles		1
11	Eye Bolts		10
12	Steel Nuts		10
13	Wire Ropes and Accessories		As required
14	Synthetic Lifting Slings		As required
15	Winches		As required
16	Safety Kits for Riggers		As required
17	First aid box		1
18	Fire extinguish		1
19	Protective clothing (aprons, gloves)		30
20	eye and hearing protection		30
21	respiratory gear		30
22	steel-toed boots		30
23	hard hats		30
24	welding helmets		30
25	Drawing instrument box		30
26	Set square celluloid 30°-60°		30
27	T-Square or Mini drafter		30
28	Drawing board		30
29	Models or diagrams demonstrating smelting, refining, and casting processes		1
30	Samples of raw materials and finished steel products		As required
31	Models or virtual simulations of blast furnaces, electric arc furnaces, and direct reduction processes.		1
32	Models or videos demonstrating forging, rolling, and extrusion processes in creating steel products.		1

Sl No	Items Name	Specification	Qty (Nos.)
33	Educational videos or presentations on best practices in housekeeping		1
34	Educational videos or presentations on best practices in housekeeping		1
35	Safety gloves, safety glasses		30
36	Brooms		10
37	mops		5
38	Brushes, and cleaning agents		color-coded bins
39	color-coded bins		As required