CRANE OPERATOR OVERHEAD (STEEL INDUSTRY)

COMPETENCY BASED CURRICULUM

(Duration: 1 Yr. 3 Months)

APPRENTICESHIP TRAINING SCHEME (ATS)

NSQF LEVEL- 4

SECTOR – PRODUCTION & MANUFACTURING

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

Directorate General of Training

Skill India
कौशल भारत-कुशल भारत

CRANE OPERATOR OVERHEAD (STEEL INDUSTRY)

(Revised in 2018)

APPRENTICESHIP TRAINING SCHEME (ATS)

NSQF LEVEL - 4

Developed By

Ministry of Skill Development and Entrepreneurship
Directorate General of Training
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
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Kolkata – 700 091

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1. .....
2. .....

Special acknowledgement is extended by DGT to the following expert members who had contributed immensely in this curriculum.

Co-ordinator for the course: Shri N Nath. ADT, CSTARI, Kolkata

Sl. No.	Name & Designation Sh./Mr./Ms.	Organization	Expert Group Designation
1.	S.N.MANNA.	ATI KOLKATA	Expert
2.			Expert
3.			Expert
4.			
5.			
6.			
7.			
8.			
9.			

CONTENTS

1. BACKGROUND

1.1 Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate(ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry**.** There are four categories of apprentices namely**; trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

1.2 Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

1.3 Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22nd December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.
- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.
- Scope has been extended also to non-engineering occupations.
- Establishments have been permitted to outsource basic training in an institute of their choice.
- The burden of compliance on industry has been reduced significantly.

2. TRAINING SYSTEM

2.1 GENERAL

Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under aegis of National Council of Vocational Training (NCVT). Craftsman Training Scheme (CTS) and Apprenticeship Training Scheme (ATS) are two pioneer programmes of NCVT for propagating vocational training.

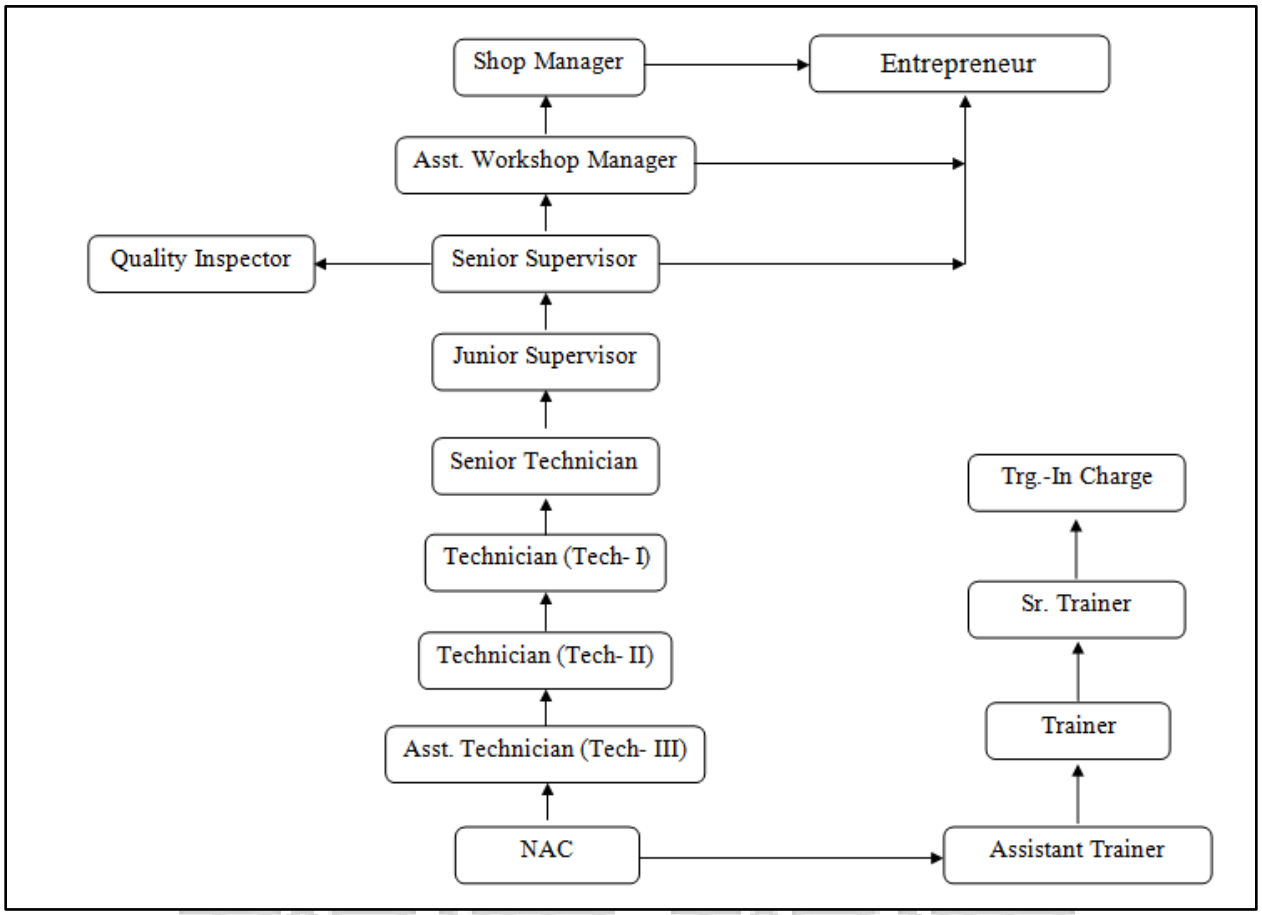
CRANE OPERATOR OVERHEAD (STEEL INDUSTRY) trade under ATS is one of the most popular courses delivered nationwide through different industries. The course is of one year three months (01 Block of 15 months duration including basic training) duration. It mainly consists of Domain area and Core area. In the Domain area Trade Theory & Practical impart professional - skills and knowledge, while Core area - Workshop Calculation and science, Engineering Drawing and Employability Skills imparts requisite core skills & knowledge and life skills. After passing out the training programme, the trainee is being awarded National Apprenticeship Certificate (NAC) by NCVT having worldwide recognition.

Broadly candidates need to demonstrate that they are able to:

- Read & interpret technical parameters/document, plan and organize work processes, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge, core skills & employability skills while performing jobs and solve problem during execution.
- Check the job/assembly as per drawing for functioning, identify and rectify errors in job/assembly.
- Document the technical parameters related to the task undertaken.

2.2 CAREER PROGRESSION PATHWAYS:

- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.
- Indicative pathways for vertical mobility.



2.3 COURSE STRUCTURE:

Table below depicts the distribution of training hours across various course elements during a period of one year (*Basic Training and On-Job Training*) : -

Total training duration details: -

Time (in months)	**1-3**	**4 - 15**
Basic Training	**Block– I**	**-----**
Practical Training (On - job training)	**----**	**Block – I**

A. Basic Training

For 02 yrs. Course (Engg) :-(**Total 06 months:** 03 months in 1st yr. + 03 months in 2nd yr.)

For 01 yr. course (Engg) :-(**Total 03 months:** 03 months in 1st yr.)

S No.	Course Element	Total Notional Training Hours	
		For 02 Yrs. course	**For 01 Yr. course**
1.	Professional Skill (Trade Practical)	550	275
2.	Professional Knowledge (Trade Theory)	240	120
3.	Workshop Calculation & Science	40	20
4.	Engineering Drawing	60	30
5.	Employability Skills	110	55
	Total (Including internal assessment)	**1000**	**500**

B. On-Job Training:-

For 02 yrs. Course (Engg) :-(**Total 18 months:** 09 months in 1st yr. + 09 months in 2nd yr.)

Notional Training Hours for On-Job Training: 3120 Hrs.

For 01 yr. course (Engg) :-(**Total 12 months**)

Notional Training Hours for On-Job Training: 2080 Hrs.

C. Total training hours:-

Duration	Basic Training	On-Job Training	Total
For 02 yrs. course (Engg)	1000 hrs.	3120 hrs.	4120 hrs.
For 01 yr. course (Engg)	500 hrs.	2080 hrs.	2580 hrs.

2.4 ASSESSMENT & CERTIFICATION:

The trainee will be tested for his skill, knowledge and attitude during the period of course and at the end of the training programme as notified by Govt of India from time to time. The Employability skills will be tested in first two semesters only.

a) The **Internal assessment** during the period of training will be done by **Formative assessment method** by testing for assessment criteria listed against learning outcomes. The training

institute have to maintain individual *trainee portfolio* as detailed in assessment guideline. The marks of internal assessment will be as per the template (Annexure – II).

b) The final assessment will be in the form of summative assessment method. The All India Trade Test for awarding NAC will be conducted by NCVT on completion of course as per guideline of Govt of India. The pattern and marking structure is being notified by govt of India from time to time. **The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check** individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

The minimum pass percent for Practical is 60% & minimum pass percent for Theory subjects 40%. The candidate pass in each subject conducted under all India trade test.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking assessment. Due consideration should be given while assessing for team work, avoidance/reduction of scrap/wastage and disposal of scarp/wastage as per procedure, behavioral attitude, sensitivity to environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work

Evidences of internal assessments are to be preserved until forthcoming semester examination for audit and verification by examination body. The following marking pattern to be adopted while assessing:

Performance Level	Evidence
(a) Weightage in the range of 60 -75% to be allotted during assessment	
For performance in this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.	• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment • Below 70% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A fairly good level of neatness and consistency in the finish • Occasional support in completing the project/job.
(b)Weightage in the range of above75% - 90% to be allotted during assessment	
For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.	• Good skill levels in the use of hand tools, machine tools and workshop equipment • 70-80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A good level of neatness and consistency in the finish • Little support in completing the project/job
(c) Weightage in the range of above 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	• High skill levels in the use of hand tools, machine tools and workshop equipment • Above 80% tolerance dimension/accuracy achieved while undertaking different work with those demanded by the component/job/set standards. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.

3. JOB ROLE

Brief description of Job roles:

Overhead Crane Operator (Steel Industry) operates :

- Electrically-driven crane running on overhead rails laid on metal bridge to lift,
- Move and lower heavy objects from one place to another.
- Switches on power supply;
- Takes position in overhead cabin and signals ground crew to move away from crane;
- Manipulates levers and controls to check and assure bridge hoist, lifting tackle etc., are free from mechanical jamming and in working order;
- Operates controls to move bridge along rails and lifting equipment along bridge tackle for loads to be attached;
- Follows signals from ground crew to raise,
- Move and lower load in desired position observing proper operating and safety conditions.
- Shuts down power supply on completion of work.
- May undertake minor repairs to crane.

Reference NCO:

i) 8343.0700 - Overhead Crane Operator
ii) 8343.0501 - EOT Crane Operator

4. NSQF LEVEL COMPLIANCE

NSQF level for CRANE OPERATOR OVERHEAD (STEEL INDUSTRY) trade under ATS: **Level 4**

As per notification issued by Govt. of India dated- 27.12.2013 on National Skill Qualification Framework total 10 (Ten) Levels are defined.

Each level of the NSQF is associated with a set of descriptors made up of five outcome statements, which describe in general terms, the minimum knowledge, skills and attributes that a learner needs to acquire in order to be certified for that level.

Each level of the NSQF is described by a statement of learning outcomes in five domains, known as level descriptors. These five domains are:

a. Process
b. professional knowledge,
c. professional skill,
d. core skill and
e. Responsibility.

The Broad Learning outcome of crane operator overhead (steel industry) trade under ATS mostly matches with the Level descriptor at Level- 4.

The NSQF level-4 descriptor is given below:

Level	Process Required	Professional Knowledge	Professional Skill	Core Skill	Responsibility
Level 4	Work in familiar, predictable, routine, situation of clear choice.	Factual knowledge of field of knowledge or study	Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts	Language to communicate written or oral, with required clarity, skill to basic Arithmetic and algebraic principles, basic understanding of social political and natural environment.	Responsibility for own work and learning.

5. GENERAL INFORMATION

Name of the Trade	CRANE OPERATOR OVERHEAD (STEEL INDUSTRY)
NCO	8343.0700, 8343.0501
NSQF Level	Level – 4
Duration of Apprenticeship Training (Basic Training + On-Job Training)	3 months+ One year (01 Block of 15 months duration including basic training).
Duration of Basic Training	a) Block –I : 3 months **Total duration of Basic Training: 3 months**
Duration of On-Job Training	a) Block–I: 12 months **Total duration of Practical Training: 12 months**
Entry Qualification	Passed in 10th class examination
Selection of Apprenticeship	The apprentices will be selected as per Apprenticeship Act amended time to time.
Instructors Qualification for Basic Training	As per ITI instructors qualifications as amended time to time for the specific trade.
Infrastructure for Basic Training	As per related trade of ITI
Examination	The internal examination/ assessment will be held on completion of each block. Final examination for all subjects will be held at the end of course and same will be conducted by NCVT.
Rebate to Ex-ITI Trainees	NIL
CTS trades eligible for Crane Operator Overhead (Steel Industry) Apprenticeship	NA

Note:

- *Industry may impart training as per above time schedule for different block, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspects is compromised.*
- *For imparting Basic Training the industry to tie-up with ITIs having such specific trade and affiliated to NCVT.*

6. LEARNING OUTCOME

6.1 GENERIC LEARNING OUTCOME

The following are minimum broad Common Occupational Skills/ Generic Learning Out come after completion of the **CRANE OPERATOR OVERHEAD (STEEL INDUSTRY)** course of 01 years duration under ATS.

Block I:-

1. Recognize & comply safe working practices, environment regulation and housekeeping.
2. Understand and explain different mathematical calculation & science in the field of study including basic electrical. *[Different mathematical calculation & science -Work, Power & Energy, Algebra, Geometry & Mensuration, Trigonometry, Heat & Temperature, Levers & Simple machine, graph, Statistics, Centre of gravity, Power transmission, Pressure]*
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Machined components & different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical & electronic symbol]*
4. Select and ascertain measuring instrument and measure dimension of components and record data.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
8. Plan and organize the work related to the occupation.

6.2 SPECIFIC LEARNING OUTCOME

Block – I

1. Practice and understand precautions to be followed while working in fitting jobs.
2. Prepare different types of documentation as per industrial need by different methods of recording information.
3. Skilled to operate overhead crane to lift, move, and position loads, such as machinery, equipment, products, and solid or bulk materials, using hoisting attachments, such as hook, sling, electromagnet, or bucket.

4. Proficient to observe load hook-up and determines safety of load.
5. Responsible in leading their entire team which participates in the moving such as spotters and flaggers.
6. Able to ensure the smooth ongoing operation and productivity of the Facility.
7. Using the grab and crane bridge to feed the treatment line with waste.
8. Selecting bulky waste and non-conforming waste to be removed from the pit.
9. Proficient for working to health, safety and other environmental standards as they apply to the process.
10. Capable of processing and movement of material.
11. Able to carry out daily checks in accordance with company procedures.
12. Competent for maintaining standard operating procedures as required.
13. Able to manipulates or depresses crane controls, such as pedals, levers, and buttons, to regulate speed and direction of crane and hoist movement according to written, verbal, or signal instructions.
14. Capable to clean and maintain crane and hoisting mechanism.
15. Skilled to inspect crane for defective parts and notify supervisor of defects or malfunctions.
16. May attach load to hook or other crane accessory prior to operating crane.

Note: *Learning outcomes are reflection of total competencies of a trainee and assessment will be carried out as per assessment criteria.*

7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING OUTCOME	
LEARNING OUTCOMES	**ASSESSMENT CRITERIA**
1. Recognize & comply safe working practices, environment regulation and housekeeping.	1. 1. Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements.
	1. 2. Recognize and report all unsafe situations according to site policy.
	1. 3. Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	1. 4. Identify, handle and store / dispose off dangerous/unsalvageable goods and substances according to site policy and procedures following safety regulations and requirements.
	1. 5. Identify and observe site policies and procedures in regard to illness or accident.
	1. 6. Identify safety alarms accurately.
	1. 7. Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	1. 8. Identify and observe site evacuation procedures according to site policy.
	1. 9. Identify Personal Productive Equipment (PPE) and use the same as per related working environment.
	1. 10. Identify basic first aid and use them under different circumstances.
	1. 11. Identify different fire extinguisher and use the same as per requirement.
	1. 12. Identify environmental pollution & contribute to avoidance of same.
	1. 13. Take opportunities to use energy and materials in an environmentally friendly manner
	1. 14. Avoid waste and dispose waste as per procedure
	1. 15. Recognize different components of 5S and apply the same in the working environment.
2. Understand, explain different mathematical calculation & science in the field of study including basic	2.1 Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat treatment, centre of gravity, friction.

electrical and apply in day to day work.*[Different mathematical calculation & science -Work, Power & Energy, Algebra, Geometry & Mensuration, Trigonometry, Heat & Temperature, Levers & Simple machine, graph, Statistics, Centre of gravity, Power transmission, Pressure]*	2.2 Measure dimensions as per drawing
	2.3 Use scale/ tapes to measure for fitting to specification.
	2.4 Comply given tolerance.
	2.5 Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.
	2.6 Ensure dimensional accuracy of assembly by using different instruments/gauges.
	2.7 Explain basic electricity, insulation &earthing.
3. Interpret specifications, different engineering drawing and apply for different application in the field of work. *[Different engineering drawing-Geometrical construction, Dimensioning, Layout, Method of representation, Symbol, scales, Different Projections, Machined components & different thread forms, Assembly drawing, Sectional views, Estimation of material, Electrical & electronic symbol]*	3. 1. Read & interpret the information on drawings and apply in executing practical work.
	3. 2. Read & analyse the specification to ascertain the material requirement, tools, and machining /assembly /maintenance parameters.
	3. 3. Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.
4. Select and ascertain measuring instrument and measure dimension of components and record data.	4.1 Select appropriate measuring instruments such as micrometres, venirecalipers, dial gauge, bevel protector and height gauge (as per tool list).
	4.2 Ascertain the functionality & correctness of the instrument.
	4.3 Measure dimension of the components & record data to analyse the with given drawing/measurement.
5. Explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	5.1 Explain the concept of productivity and quality tools and apply during execution of job.
	5.2 Understand the basic concept of labour welfare legislation and adhere to responsibilities and remain sensitive towards such laws.
	5.3 Knows benefits guaranteed under various acts

6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	6.1 Explain the concept of energy conservation, global warming, pollution and utilize the available recourses optimally & remain sensitive to avoid environment pollution.
	6.2 Dispose waste following standard procedure1.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	7. 1. Explain personnel finance and entrepreneurship.
	7. 2. Explain role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes & procedure & the available scheme.
	7. 3. Prepare Project report to become an entrepreneur for submission to financial institutions.
8. Plan and organize the work related to the occupation.	8. 1. Use documents, drawings and recognize hazards in the work site.
	8. 2. Plan workplace/ assembly location with due consideration to operational stipulation
	8. 3. Communicate effectively with others and plan project tasks
	8. 4. Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same.
SPECIFIC OUTCOME	
<u>Block-I</u>	
*Assessment Criteria i.e. the standard of performance, for each specific learning outcome mentioned under **Block – I**(section: 10) must ensure that the trainee works in familiar, predictable, routine, situation of clear choice. Assessment criteria should broadly cover the aspect of **Planning** (Identify, ascertain, etc.); **Execution** apply factual knowledge of field of knowledge, recall and demonstrate practical skill during performing the work in routine and repetitive in narrow range of application, using appropriate rule and tool, complying with basic arithmetic and algebraic principles and language to communicate in written or oral with required clarity; **Checking/ Testing** to ensure functionality during the assessment of each outcome. The assessments parameters must also ascertain that the candidate is responsible for his/her own work and learning.*	

8. SYLLABUS

BASIC TRAINING (Block – I)

Duration: (03) Three Months

Week No.	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
1.	Safety: - its importance, classification, personal, general, workshop and job safety. Occupational health and safety. Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution & personal safety message. Preventive measures for electrical accidents & steps to be taken in such accidents. Importance of housekeeping & good shop floor practices. Disposal procedure of waste materials like cotton waste, metal chips/burrs etc. Fire& safety: Use of Fire extinguishers. Safety regarding working with different types of steam and its First-Aid.	Importance of safety and general precautions observed in the industry/shop floor. All necessary guidance to be provided to the new comers to become familiar with the working of Institute system including stores procedures. Introduction of First aid. Safety attitude development of the trainee by educating him to use Personal Protective Equipment (PPE). Response to emergencies e.g.; power failure, fire, and system failure. Accidents- Definition types and causes. First-Aid, nature and causes of injury and utilization of first-aid. Introduction to 5S, VMW (Visual Work Place) concept & its application. Fire: - Types, causes and prevention methods. Fire Extinguisher, its types. Define environment, environment Pollution, Pollutants, type of Pollution (Air pollution, water pollution, soil pollution noise pollution, thermal pollution, radiation. Global warming its causes and remedies. Industrial Waste its types, sources and waste Management.
2.	<u>Fitting Shop (Tolerance ± .05 mm) :</u> • Safety in fitting shop. • Tools used in fitting - their purpose and function. • Marking the job. • Different types of chisels and their selection. • Use of hacksaw.	Importance of Material Handling in steel industry, and various types of material handling equipment Different types of cranes commonly used in Steel Industry and their specific used. General description and construction of simple E.O.T. crane Duties and Responsibilities of a crane operator. Main parts of an E.O.T. crane and functions

		of each parts. Long Travel and Cross Travel assemble Special purpose cranes and functions of each
3.	Fitting Shop (Tolerance ± .05 mm) : • Types of files and their uses. • Chipping. • Drilling and tapping. • Counter sinking. • Preparation of studs, nuts, etc, • Simple fitting exercises.	Lifting devices: Simple hook, C-hook, Ramshorn Hook, Spreader Beam, Claw, Magnet Brab Bucket etc and criteria for selecting a particular device Ropes and slings, choice of a sling for a particular load.
4.	Electrical Shop: • Use of basic hand tools for electrical trade group. • Use of electrical appliances such as switches, plugs cut outs, fuses, regulator etc. • Making simple circuits on board. • Verification of Ohm's Law.	The electrical system of crane – power supply, main and trolley bus bars, isolator, circuit breaker, fuses, contact panel resistances, motors, master controllers, eldros etc. Crane operation – handling over, taking over, restart checks, sequence in starting the crane, moving the crane, stopping the crane, reversing, braking, parking etc.
5.	Electrical Shop: • Use of electrical measuring instruments'. • Locating and rectifying faults in simple circuits. • Running , care and maintenance of all types of D.C. and A.C. motors, and starter, generators, rectifiers, • Electrical maintenance aspects.	• Types of brakes. • Function and types of Limit switch • Drives and inter locks in a crane • Crane signals • Stops to be taken in case of emergency power failure, fire in the cabin or crane, sudden failure of some vital parts. • General safety rules • Shut down produces.
6.	Welding Shop: • Safety in welding shop. • Use of hand tools for oxy-acetylene welding. • Use of welding torch, acetylene generators and oxygen cylinder. • Simple welding and gas cutting exercises • Brazing and soldering	• Types and classification of cranes, I. S. I. specification(15807; 4137, 3177) covering the cranes with special reference to steel plant application. • Tong cranes - rigid and flexible "type, construction tong ' opening, closing and slewing mechanism • Method of inspection of crane equipment and checking their suitability for working. • Safety devices in a crane and proper use and function of each.
7.	- Do -	• Safety on cranes.

		• Uses and misuses of a crane. • Unsafe conditions for crane movement. • Care of chains, slings, hooks, magnet etc. • Common defects - causes and remedial measures.
8.	<u>Maintenance Shop</u> • Dismantling, assembling, repairing, changing of parts and lubrication of vices. • Valves - types. • Gasket cutting and fitting.	General instruction for crane operator. Do's and don'ts for a good operator. Magnet cranes - special features and safety measures. Comparative study of AC & DC cranes. General maintenance instructions. Preventive and running maintenance of crane. Lubrication system of a crane.
9.	<u>Maintenance Shop</u> • Pumps. • Hydraulic equipment. • Gear boxes. • Bearing and fittings dismantling and assembling. • Couplings, pillow block's.	Testing and commissioning of a crane. Testing and taking over of a crane after repairs.
10.	<u>Rigging:</u> • Wire ropes, slings. • Judgment and shifting of weight. • Lifting equipment.	Provisions under factory act relating to operation and maintenance of a crane. First aid. Fire fighting. Study of some typical breakdown cases - cause and steps taken to rectify it. Cost factors - cost of equipment- and cost of an accident. Fast wearing crane parts and their norms of rejection.
11.	<u>Rigging:</u> • Different types of knots. • Chain pulley blocks, hooks. • Grease, lubricants and lubricating system. • Tools used in maintenance.	Importance and growth of Iron and Steel Industry in India Technological innovation in steel making Name, location, present capacity and future plans of steel producing industries

12.	- Do -	Raw materials needed for the Iron and Steel Industry. Their availability in India Special feature of steel industry, steel production .through integrated steel plants and through smaller units (including mini steel plant). Raw materials preparation methods : sintering pelletizing and their relative advantages and disadvantages.
13.	**Revision & Internal Assessment**	

Note: - *More emphasis to be given on video/real-life pictures during theoretical classes. Some real-life pictures/videos of related industry operations may be shown to the trainees to give a feel of Industry and their future assignment.*

9. SYLLABUS - CORE SKILLS

9.1 WORKSHOP CALCULATION SCIENCE & ENGINEERING DRAWING

Block – I		
Sl. No.	**Workshop Calculation and Science (Duration: - 20 hrs.)**	**Engineering Drawing (Duration: - 30 hrs.)**
1.	Applied workshop problems involving simple addition, subtraction, multiplication, division and common fractions.	- Introduction to Engineering drawing, its importance and uses in engineering fields. Simple definitions of Points, Lines, Parallel straight lines.
2.	Science- Definition, Nomenclature, various branches, significance and definitions of important terms.	Geometrical construction of Square, Rectangle, Triangle, Circle, Polygons, etc.
3.	Rounding of decimal values, use of approximation.	Drawing different types of lines.
4.	Units – Definition, fundamental & derived units, system of units- FPS, CGS, MKS and SI units of some important parameters- Length , mass, time, density, current, voltage, pressure etc. Unit conversion.	- Free hand sketch of Hand tools used in the trade.
5.	Workshop problems related to average.	- Screw Threads – Forms of Various Screw threads used in general in the industry – Nomenclature, convention
6.	Workshop problems related to percentage.	- Fastening Devices – Temporary and Permanent. Meaning and difference. Temporary Device – Hexagonal Bolt, Nut, Check Nut, Washer.
7.	Different Methods of Preventions of rotation of Bolts - Check nut, Square headed bolt, Square headed bolt with square neck, cup headed bolt, Eye bolt, counter sunk headed bolt, rag bolt, etc.	- Workshop problems related to ratio and proportion
8.	Workshop problems related on time & work.	Different Methods of locking of nuts :- a) Lock nuts, b) Split pin, c) Slotted nut, d) Simmonds nut, e) Castle nut, **f**) Wings nut, etc.
9.	Profit & Loss and problems concerning to workshop practices	Permanent Fastening Devices- Rivets – different parts and their types Different

		types of rivet heads.
10.	Properties of Matter- Different types of Properties of Matter e.g. Mechanical, Electrical, Chemical, Magnetic.	Rivets Joints – Lap joint and Butt or Strap joint. Lap Joint – a) Single Riveted, b) Double riveted, i) Chain, ii) zigzag Butt Joint – a) Single plate or strap, b) Double plate or strap
11.	Properties of Matter (Mechanical) - Tenacity, Toughness, Malleability, Ductility, Elasticity, Plasticity, Brittleness, Hardness (concept & definition)	Keys and Cotter Joints, Difference between Keys and Cotters, Different types of Keys.
12.	Properties and uses of copper, zinc, lead, tin, aluminum, brass, bronze, solder, bearing metals, timber, and rubber.	
13.	Engineering Material- Introduction, classification, Metallic- Non metallic material, physical and mechanical properties,	
14.	Heat & temperature- Definition and its importance. Scales of Temperature, e.g. Fahrenheit, Centigrade, Kelvin- relationship between them.	
15.	Transmission of heat- Conduction, Convection and Radiation. Examples from Industries (concept & definition)	
16.	Transmission of Power and motion of Belt and Pulleys:- Driver and Follower – Open and Cross belt system of belt drives. Velocity ratio. Power Transmission by belt – Problems	

9.2 EMPLOYABILITY SKILLS

(DURATION: - 55 HRS.)

Topic No.	Topic	Duration (in hours)
	English Literacy	**7**
1.	Reading **Reading and understanding simple sentences about self, work and environment**	
2.	Writing **Construction of simple sentences Writing simple English**	
3.	Speaking / Spoken English **Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality,Resumes or curriculum vita essential parts, letters of application reference to previous communication.**	
	I.T. Literacy	**10**
1.	Basics of Computer **Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.**	
2.	Word processing and Worksheet **Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document.** **Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets.** **Use of External memory like pen drive, CD, DVD etc,**	
3.	Computer Networking and INTERNET **Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication.**	
	Communication Skill	**18**
1	Introduction to Communication Skills **Communication and its importance** **Principles of Effective communication** **Types of communication - verbal, nonverbal, written, email, talking on phone.** **Nonverbal communication - components-Para-language**	

	Body - language **Barriers to communication and dealing with barriers.**	
2	Listening Skills **Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening.**	
3	Motivational Training **Characteristics Essential to Achieving Success** **The Power of Positive Attitude** **Self awareness** **Importance of Commitment** **Ethics and Values** **Ways to Motivate Oneself** **Personal Goal setting and Employability Planning.**	
4	Facing Interviews **Manners, Etiquettes, Dress code for an interview** **Do's & Don'ts for an interview**	
	Entrepreneurship skill	**8**
1.	**Concept of Entrepreneurship** **Entrepreneurship- Entrepreneurship - Enterprises:-Conceptual issue. Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.**	
2.	Institutions Support **Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes& procedure & the available scheme.**	
	Productivity	
1.	**Productivity** Definition, Necessity.	
2.	**Affecting Factors** Skills, Working Aids, Automation, Environment, Motivation How improves or slows down.	
3.	**Personal Finance Management** Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.	
	Occupational Safety, Health & Environment Education	**6**
1	Safety & Health **Introduction to Occupational Safety and Health importance of safety and health at workplace.**	

2	Occupational Hazards **Basic Hazards, Chemical Hazards, Vibro-acoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.**	
3	Accident & safety **Basic principles for protective equipment.** **Accident Prevention techniques - control of accidents andsafety measures.**	
4	First Aid **Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person**	
	Labour Welfare Legislation	
1	Welfare Acts **Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Employees Provident Fund Act.**	
	Quality Tools	**6**
1.	**Quality Consciousness :** Meaning of quality, Quality Characteristic	
2.	**Quality Circles :** **Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles.**	
3.	**House Keeping :** **Purpose of Housekeeping, Practice of good Housekeeping.**	
4.	Quality Tools **Basic quality tools with a few examples**	

10. DETAILS OF COMPETENCIES (ON-JOBTRAINING)

The **competencies/ specific outcomes** on completion of On-Job Training are detailed below: -

Block – I

1. Practice and understand precautions to be followed while working in fitting jobs.
2. Prepare different types of documentation as per industrial need by different methods of recording information.
3. Safety aspects of crane operations.
4. Reading, Understanding, Interpreting & follow SOP (Standard Operating Procedure)
5. Taking over and handing over crane.
6. Family its and locating main parts.
7. Signalling.
8. Checks before starting a crane.
9. Sequence in starting a crane.
10. Checks after starting and before moving the crane.
11. Procedure for lifting heavy loads.
12. Testing of limit switches and brakes.
13. Testing of slings, ropes and magnets.
14. Moving the load.
15. Long travel movements.
16. Cross travel.
17. Lifting, lowering and positioning of load.
18. Control of swing.
19. Simple driving exercises on an E.O.T. Crane.
20. Parking and leaving the crane.
21. Steps to be taken in case of power failure.
22. Steps to be taken in case of fire in the cabin.
23. Steps to be taken in case of break-down.
24. Steps to be taken in case of accident or collision.
25. Driving practice on different types of cranes like semi-portal, magnet, mobile, tong type etc.
26. Standard Crane Signal exercises.
27. Cleaning and maintenance.
28. Lubrication and servicing.
29. Exercises in giving artificial respiration.
30. -Diagonal, curve and step driving. .
31. Crossing obstacles on the Shop Floor.
32. Checking and operation of electrical system supply to bus bars, isolators, circuit breaker, fuses, resistances, control power:, motors, master controllers.

33. Checking and operation of eldros, hydraulic brake, brake drum, wheels and driving pinions, couplings, ropes, hooks, traverses and all load carrying equipment including magnets.

Note:

1. Industry must ensure that above mentioned competencies are achieved by the trainees during their on job training.

2. In addition to above competencies/ outcomes industry may impart additional training relevant to the specific industry.

ANNEXURE – I

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

CRANE OPERATOR OVERHEAD (STEEL INDUSTRY)			
LIST OF TOOLS AND EQUIPMENT for Basic Training (For 20 Apprentices)			
A. TRAINEES TOOL KIT (For each additional unit trainees tool kit Sl. 1-18 is required additionally)			
Sl. no.	**Name of the Tool &Equipments**	**Specification**	**Quantity**
1	Steel Rule	15 cm with metric graduation	16 nos.
2	Try Square.	150 mm blade	16 nos.
3	Caliper inside spring type.	150 mm	16 nos.
4	Caliper hermaphrodite spring type	150 mm	16 nos.
5	Caliper outside spring type	150 mm	16 nos.
6	Divider spring type	150 mm	16 nos.
7	Scriber	150 mm	16 nos.
8	Centre Punch	10 mm and Length - 120 mm	16 nos.
9	Screw driver	150mm insulated flat type	16 nos.
10	Chisel cold flat	20 mm X 150 mm High carbon steel	16 nos.
11	Hammer ball peen With handle	450 grams (1 lb)	16 nos.
12	Hammer ball peen With handle.	220 grams (1/2 lb)	16 nos.
13	File flat - second cut	250 mm	16 nos.
14	File flat smooth	250 mm.	16 nos.
15	File half round second cut	150 mm.	16 nos.
16	Hacksaw frame fixed type	300 mm	16 nos.
17	Safety goggles.		16 nos.
18	Dot punch	100 mm	16 nos.
B : INSTRUMENTS & GENERAL SHOP OUTFIT- For 2 (1+1) units no additional items are required			
INSTRUMENTS			
19.	Steel Rule Graduated both in Metric and English Unit	300 mm Stainless steel	4 nos.
20.	Straight edge steel	300 mm or above	2 nos.
21.	Spirit Level metal Type - 2	300 mm Basic Length Accuracy 0.1mm/Meter	1 no.
22.	Stud Extractor EZY - out	Set of 8	2 sets
23.	Combination Set	300 mm	2 nos.
24.	Micrometer outside.	25 - 50 mm	2 nos.
25.	Vernier caliper	150 mm	4 nos.

26.	Wire gauge, metric standard.		1 no.
GENERAL SHOP OUTFIT			
27.	Surface plate C.I/Granite with Stand and Cover	600 x 600 mm	1 nos.
28.	Marking table (Mild steel)	900X900X900 mm	1 no.
29.	Universal scribing block.	220 mm	2 nos.
30.	V-Block pair with clamps	150 x 100 x 100 mm	2 nos.
31.	Angle plate	150 X 150 X 250 mm	2 nos.
32.	Punch letter set.	3 mm	1 no.
33.	Punch number set.	3 mm	1 no.
34.	Portable hand drill (Electric)	0 to 13 mm Capacity	1 no.
35.	Drill twist straight shank	3 mm to 12 mm by 0.5 mm H.S.S.	2 sets
36.	Drill twist Taper shank	8 mm to 20 mm by 0.5 mm H.S.S.	2 sets
37.	Taps and dies complete set	5, 6, 8, 10 & 12 mm set of 5	2 Sets
38.	File knife edge smooth	150 mm	4 nos.
39.	File feather edge smooth	150 mm	4 nos.
40.	File triangular smooth	200 mm	8 nos.
41.	File round second cut	200 mm	8 nos.
42.	File square second cut	250 mm	8 nos.
43.	Feeler gauge	Gauge Feeler / Thickness - 0.05 mm to 0.3 mm by 0.05 and 0.4 mm to 1 mm by 0.1 mm - 13 leaves	1 set
44.	File triangular second cut.	200 mm	8 nos.
45.	File hand second cut.	150 mm	8 nos.
46.	File card.	3"x5" size, brass or steel wire	8 nos.
47.	Oil Can	250 ml	2 nos.
48.	Pliers combination insulated	150 mm	2 nos.
49.	Wooden handle forged Soldering Iron copper bit.	230V, 250 W, 350 gm	2 nos.
50.	Blow Lamp	0.5 litre	2 nos.
51.	Spanner- Double Ended	6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22	1 set each
52.	Spanner adjustable	150 mm	2 nos.
53.	Interchangeable ratchet socket set	12 mm driver, sized10-32 mm set of 18 socket & attachments.	1 set
54.	Double Ended tubular Box spanner set with Tommy bar.	A/F 6-25 mm set of 10 Tommy Bar Dia 6, 8, 10, 12, 14, 16	1 set
55.	Scraper flat	150 mm	8 nos.
56.	Chisel cold flat	9 mm X 100 mm	8 nos.

57.	Combination Plier Insulated	200 mm	4 Nos.
58.	Screw Driver Insulated	4mm X 150 mm, Diamond Head	4 Nos.
59.	Screw Driver Insulated	6mm X 150 mm	4 Nos.
60.	Electrician screw driver thin stem insulated handle	4mm X 100 mm	4 Nos.
61.	Neon Tester	500 V	4 Nos.
62.	Wire Cutter and Stripper	150 mm	4 Nos.
63.	Relay- a. Cut out Relays b. Reverse current c. Over curren d. Under voltage	 a. 16A, 440V b. 16A, 440V c. 16A, 440V d. 360V-440V	1 No. each
64.	Series Test Lamp	230V, 60W	4 Nos.
65.	Miniature Breaker	16 amp	2 Nos.
66.	MCCB	100Amps, Triple pole	1 No.
67.	Fuses	HRC Glass Rewire Type	3 Each
68.	Digital Multi Meter	DC 200mv -1000v,0 – 10A & AC 200mv- 750v , 0-10A, resistance 0-20 MΩ and 3 1/2 digit	2 Nos.
69.	3- point D.C. Starter	For 2.5 KW DC motor	1 No.
70.	4- point D.C. Starter	For 2.5 KW DC motor	1 No.
71.	Vice bench	150 mm	20 nos.
72.	Bench working.	2400 x 1200 x 900 mm	4 nos.
73.	Almirah.	1800 x 900 x 450 mm	2 nos.
74.	Lockers with 8 drawers (standard size).	One locker for each trainee	3 nos.
75.	Metal rack	1820 x 1820 x 450 cm	1 no.
	INSTRUMENTS		
76.	Steel Rule Graduated both in Metric and English Unit	300 mm Stainless steel	4 nos.
77.	Straight edge steel	300 mm or above	2 nos.
78.	Spirit Level metal Type - 2	300 mm Basic Length Accuracy 0.1mm/Meter	1 no.
79.	Stud Extractor EZY - out	Set of 8	2 sets
80.	Combination Set	300 mm	2 nos.
81.	Micrometer outside.	25 - 50 mm	2 nos.
82.	Vernier caliper	150 mm	4 nos.
83.	Wire gauge, metric standard.		1 no.
C. LIST OF ADDITIONAL TOOLS FOR ALLIED TRADE IN WELDING			

84.	Oxy - acetylene gas welding set equipment with hoses, Oxygen & Acetylene cylenders, regulator and other accessories.		1 Set.
85.	Gas welding table with positioner with Fire Bricks	900 X 600 X 750 mm	1 No
86.	Welding torch tips of different sizes for Oxy - acetylene gas welding	To fit nozzel no. 1, 2, & 3	1 Set
87.	Gas lighter.		2 Nos
88.	Trolley for gas cylinders.		1 No
89.	Chipping hammer.		2 Nos
90.	Gloves (Leather)		2 Pairs
91.	Leather apron.		2 Nos
92.	Spindle key for cylinder valve.		2 Nos.
93.	Welding torches.	Nozzles no. 1, 2, & 3	1 Set.
94.	Welding goggles		4 Pairs.
95.	Welding helmet with coloured flame retardent glass		2 Nos.
96.	Tip cleaner		5 Sets.
D. LIST OF TOOLS & ACCESSORIES FOR PNEUMATICS AND HYDRULICS			
97.	Compressor unit	suitable for Pressure: 8 bar, Delivery: 50 lpm (or more), Reservoir capacity: 24 Litres (or more), 230V, 50 Hz, with pressure regulator and water separator	1 No.
98.	Pneumatic Workstation with 40 square mm aluminium profile legs, wooden work surface, and one pedestal drawer unit having 5 drawers, each with handles and individual locks, on metallic full panel drawer slide:	(1) Work Table – Size(Approx.) L1200mmXW900mmXH900mm, with four castor wheels including two lockable wheels at the front side, (2) Drawer – Size (Approx.) – L460mmxW495mm xH158mm each, and overall size of Drawer unit (Approx.) L470mmxW495mmxH825mm and (3) Drawer slide height (Approx.) 85mm.	1 No
99.	Carrier for mounting components, such as PB & relay boxes.		1 No
100.	Cut section model for pneumatic components		1 set
101.	Hydraulic Trainer Kit, each consisting of the following		01 set

	matching components and accessories:			
	I.	Hydraulic Power pack	with (1) external gear pump having a delivery rate of 2.5 lpm, (approx.) @ 1400 rpm operating pressure 60 bar, coupled to a single-phase AC motor (230 V AC) having start capacitor and ON/OFF switch and overload protection, (2) pressure relief valve adjustable from 0 – 60 bar, (3) oil reservoir, ≥5 litres capacity having sight glass, drain screw, air filter, and P and T ports.	1 No.
	II.	Pressure relief valve	pilot-operated	1 No
	III.	Drip tray, steel	size 1160 mm x 760 mm.	1 No.
	IV.	Pressure Gauge	Glycerin-damped, Indication range of: 0 – 100 bar	1 No.
	V.	Four-Way distributor	with five ports, equipped with a pressure gauge	1 No.
	VI.	Double acting hydraulic cylinder	with a control cam, Piston diameter16 mm, Piston rod diameter10 mm, Stroke length 200 mm.	1 No.
	VII.	Suitable Weight	for vertical loading of hydraulic cylinder	1 No.
	VIII.	Mounting kit for weight	for realizing pulling and pushing load.	1 No.
	IX.	3/2-way directional control valve	with hand lever actuation.	1 No.
	X.	4/2-way directional control valve	with hand lever actuation.	1 No.
	XI.	4/3-way directional control valve	closed-centre position, with hand lever actuation.	1 No.
	XII.	Non-return valve.		1 No.
	XIII.	Pilot-operated check valve	pilot to open.	1 No.
	XIV.	One-way flow control valve	with integrated check valve.	1 No.
	XV.	T-Connector with self sealing coupling nipples (2 Nos.) and quick coupling socket (1 No.).		2 Nos.
	XVI.	Profile plate,	Anodised Aluminium, 1100x700 mm, with carriers, mounting frames and mounting accessories (To be fitted onto the Hydraulic workstation)	1 set

INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND ENGINEERING DRAWING

TRADE: CRANE OPERATOR OVERHEAD (STEEL INDUSTRY)

LIST OF TOOLS& EQUIPMENTS FOR -20APPRENTICES

1) **Space Norms** : 45 Sq.m.(For Engineering Drawing)

2) Infrastructure:

A : TRAINEES TOOL KIT:-			
Sl. No.	**Name of the items**	**Specification**	**Quantity**
1.	Draughtsman drawing instrument box		20+1 set
2.	Set square celluloid 45^o	250 X 1.5 mm	20+1 set
3.	Set square celluloid 30^o-60^o	250 X 1.5 mm	20+1 set
4.	Mini drafter		20+1 set
5.	Drawing board ()	700mm x500 mm IS: 1444	20+1 set
B : Furniture Required			
Sl. No.	**Name of the items**	**Specification**	**Quantity**
1	Drawing Board		20
2	Models : Solid & cut section		as required
3	Drawing Table for trainees		as required
4	Stool for trainees		as required
5	Cupboard (big)		01
6	White Board	size: 8ft. x 4ft.	01
7	Trainer's Table		01
8	Trainer's Chair		01

TOOLS & EQUIPMENTS FOR EMPLOYABILITY SKILLS		
Sl. No.	**Name of the Equipment**	**Quantity**
1.	Computer (PC) with latest configurations and Internet connection with standard operating system and standard word processor and worksheet software	10 Nos.
2.	UPS - 500VA	10 Nos.
3.	Scanner cum Printer	1 No.
4.	Computer Tables	10 Nos.
5.	Computer Chairs	20 Nos.
6.	LCD Projector	1 No.
7.	White Board 1200mm x 900mm	1 No.
Note: - Above Tools & Equipments not required, if Computer LAB is available in the institute.		

ANNEXURE-II

FORMAT FOR INTERNAL ASSESSMENT

Name & Address of the Assessor :			**Year of Enrollment :**
Name & Address of ITI (Govt./Pvt.) :			**Date of Assessment :**
Name & Address of the Industry :			**Assessment location: Industry / ITI**
Trade Name :	**Semester:**		**Duration of the Trade/course:**
Learning Outcome:			

Sl. No	**Candidate Name**	**Father's/Mother's Name**	Safety consciousness (15)	Workplace hygiene (5)	Attendance/ Punctuality (10)	Ability to follow Manuals/ Written instructions (5)	Application of Knowledge (10)	Skills to handle tools & equipment (10)	Economical use of materials (5)	Speed in doing work (10)	Quality in workmanship (15)	VIVA (15)	**Total internal assessment Marks**	**Result (Y/N)**
1														
2														