



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

COMPETENCY BASED CURRICULUM

HEALTH, SAFETY & ENVIRONMENT

(Duration: One Year)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4



SECTOR – SAFETY & SECURITY

HEALTH, SAFETY & ENVIRONMENT

(Non-Engineering Trade)



CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL - 4

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Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE

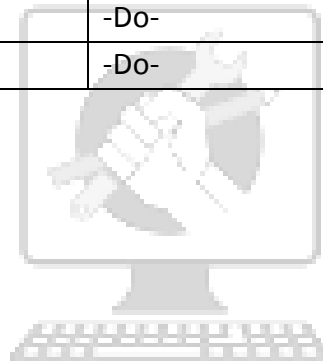
EN-81, Sector-V, Salt Lake City,
Kolkata – 700 091

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List of Expert Members participated/contributed for finalizing the course curriculum of Health, Safety & Environment held on 06.06.2017 at CSTARI, Kolkata			
S No.	Name & Designation Sh/Mr./Ms.	Organization	Remarks
1.	H. V. Samvatsar, Director	CSTARI, Kolkata	Chairman
1.	L.K. Mukherjee, DDT	-Do-	Co-ordinator
2.	Soumitra Chatterjee, MD	Dhruvsatya Centre for personal Transformation Pvt. Ltd.	Expert
3.	Purna Chandra Barad, Chief Manager- HR & Admin	Dhruvsatya Centre for personal Transformation Pvt. Ltd.	Expert
4.	Mr. Kanailal Biswas, Ex- Plant in charge	Zamil Steel Tower and Galvanizing factory, Dumman, Soudi Arabia	Expert
5.	Mr. Krishnendu sarkar, Director	Akass Infrastructure pvt. Ltd., Kolkata	Expert
6.	Dipak Rungta, Manager	Lalit Hardware, Expert in Disaster Management power tools & Equipments, Kolkata-1	Expert
7.	N.B. Reshamwal, Asst. Director	Regional Labour Institute, Kolkata	Member
8.	Sourashis Mitra, Junior Assistant	Indian Institute of Engineering, Science and Technology, Shibpur (IEST), Howrah- 711103	Member
9.	Sujay Banerjee, Senior Instructor	West Bengal Fire & Emergency Services, Seal Para, Kolkata	Expert
10.	Shyam Chandra Mondal, Officer In Charge	West Bengal Fire & Emergency Services, Serampore, Mahesh Hoogly	Expert
11.	R.N. Bandhopadhaya, OSD	Directorate of Industrial Training- Govt. of West Bengal, Kolkata	Member
12.	Shri Alok Sharma, Chief General Manager	Indraprastha Gas Limited, New Delhi	Expert
13.	Shri Santokh Singh, Ex-Chief Fire Officer	Delhi Fire Services, New Delhi	Expert
14.	Capt. Krishan Kumar, Chairman	Delhi Institute of Fire Engineering, New Delhi-77	Expert
15.	Shri Praveen Choudhari,	Dolphin Energy Ltd., Qatar	Expert

	Emergency Response Officer		
16.	Lt. Col. RC Shukla, Principal	Delhi Institute of Fire Engineering, New Delhi-77	Expert
17.	Shri P S Bhadana, Dy. Director	-do-	Expert
18.	Shri B L Chauhan, Senior Instructor	-do-	Expert
19.	Bhagwati Prasad Ojha, HSE Engineer	-do-	Expert
20.	Praveen Kumar Garg, Sr. Manager HSE	Ouippo Oil & Gas Infrastructure Ltd., Gurgaon, Haryana	Expert
21.	Devki Nandan, HSE Expert	Indraprastha Gas Ltd.	Expert
22.	Sanjay Kumar, JDT/HOO	CSTARI, Kolkata	Member
23.	A.K. Mandal, ADT	-Do-	Member
24.	M.K. Batabyal, TO	-Do-	Member



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S No.	Topics	Page No.
1.	Course Information	1
2.	Training System	2-5
3.	Job Role	6
4.	General Information	7-8
5.	NSQF Level Compliance	9
6.	Learning/ Assessable Outcome	10-11
7.	Learning Outcome with Assessment Criteria	12-17
8.	Trade Syllabus	18-28
9.	Core Skill – Employability Skill	29-33
10.	Annexure I	
	List of Trade Tools & Equipment	34-36
	List of Tools & Equipment for Employability Skill	37
11.	Annexure II - Format for Internal Assessment	38

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1. COURSE INFORMATION

During the one-year duration of “Health, Safety & Environment” trade, a candidate is trained on Professional Skill, Professional Knowledge and Employability Skill. In addition to this, a candidate is entrusted to undertake project work, extracurricular activities and on-the-job training to build up confidence. The broad components covered related to the trade are categorized in two semesters each of six months duration. The semester wise course coverage is categorized as below:

1st Semester – In this semester the trainees will Plan & prepare accident prone area and methods adopted for reducing accidents with safety. Identify and apply safety policy in an industry. List out the duties and implement Safety Targets, Objectives, Standards, Practices and Performances. They will also Plan, identify, marking and evaluate performance of display of explosives. They can Prepare profile with an appropriate accuracy as per safety precaution in workshop. They Plan, Select and implement safety and Health objectives and Targets, performance standards. Identify the various technique of fire and other hazards. They will also Identify, select and method of operation of fire extinguishers as per requirements. Plan and execute hose & hose fittings. Select and prepare the hydrant and pump system for proper application. Identify; select respiratory personal protective devices and its maintenance. Identify the effect, its measurement of radiation and its control on human body.

2nd Semester – During this semester trainees will identify parameters governing the safety in construction and its impact in environment they will also identify the various technique of earthing fault protection. They can Plan and apply the methods of plant design and housekeeping Verify and check of all industry Hazards in process of melting (Furnaces), Casing, and Forging. They can Identify Types of water relay management system Clarify and execute the risk analysis exercise, Select and use PPE, its care and maintenance. They will able to Apply the method of bulk storage system of LPG/CNG Prepare case study major Chemical Disasters.

2. TRAINING SYSTEM

2.1 GENERAL

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

‘Health, Safety & Environment’ trade under CTS is one of the popular courses delivered nationwide through a network of ITIs. The course is of one year (02 semesters) duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory & Practical) impart professional skills and knowledge, while the Core area (Employability Skill) imparts requisite core skills, knowledge, and life skills. After passing out the training program, the trainee is awarded National Trade Certificate (NTC) by NCVT which is recognized worldwide.

Candidates broadly need to demonstrate that they are able to:

- Read and interpret technical parameters/documents, plan and organize work processes, identify necessary materials and tools;
- Perform tasks with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge & employability skills while performing jobs.
- Document the technical parameters related to the task undertaken.

2.2 CAREER PROGRESSION PATHWAYS

- Can join Apprenticeship programs in different types of industries leading to a National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming an instructor in ITIs.

2.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of one year (02 semesters): -

S No.	Course Element	Notional Training Hours
1.	Professional Skill (Trade Practical)	1320
2.	Professional Knowledge (Trade Theory)	264
3.	Employability Skills	110
4.	Library & Extracurricular activities	66
5.	Project Work	160
6.	Revision & Examination	160
	Total	2080

2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of the course and at the end of the training program as notified by the Government of India (GoI) from time to time. The employability skills will be tested in the first two semesters itself.

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 has to maintain an 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 NTC will be conducted by NCVT at the end of each semester as per the guideline of Government 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 the basis for setting question papers for final assessment. The examiner during final examination will also check** the individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

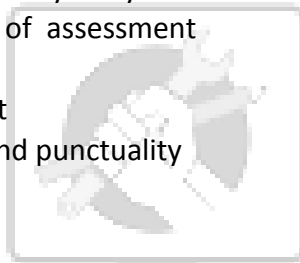
The minimum pass percentage for practical is 60% & minimum pass percentage of theory subjects is 40%. For the purposes of determining the overall result, 50% weightage is applied to the result of each semester examination.

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 the assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the 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:

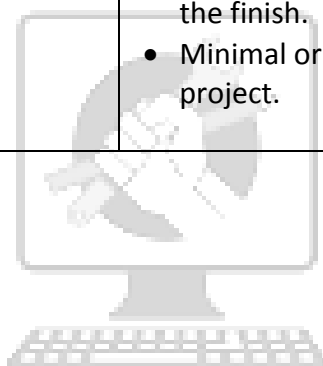
- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work



Evidences of internal assessments are to be preserved until forthcoming semester examination for audit and verification by examining 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 should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices	<ul style="list-style-type: none"> • Demonstration of good skill in the use of hand tools, machine tools and workshop equipment. • Below 70% tolerance dimension achieved while undertaking different work with those demanded by the component/job. • A fairly good level of neatness and consistency in the finish. • Occasional support in completing the project/job.
(b) Weightage in the range of 75%-90% to be allotted during assessment	
For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and	<ul style="list-style-type: none"> • Good skill levels in the use of hand tools, machine tools and workshop equipment. • 70-80% tolerance dimension achieved while undertaking different work with those

<p>regard for safety procedures and practices</p>	<p>demand by the component/job.</p> <ul style="list-style-type: none"> • A good level of neatness and consistency in the finish. • Little support in completing the project/job.
<p>(c) Weightage in the range of more than 90% to be allotted during assessment</p>	
<p>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.</p>	<ul style="list-style-type: none"> • High skill levels in the use of hand tools, machine tools and workshop equipment. • Above 80% tolerance dimension achieved while undertaking different work with those demanded by the component/job. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.



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3. JOB ROLE

Health, Safety and Environment Officer; applies theory and principles of environmental engineering and occupational health and safety at the work site to ensure a safe and healthful working environment, protect the surrounding environment that may be impacted by the facility, improve employee relations and productivity, and minimize business risk through the identification and elimination/minimization of environmental, health and safety risks.

Reference NCO-2015: 3257.0600



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4. GENERAL INFORMATION

Name of the Trade	HEALTH, SAFETY & ENVIRONMENT
NCO - 2015	3257.0600
NSQF Level	Level-4
Duration of Craftsmen Training	One Year (2 Semesters)
Entry Qualification	<p>a. Passed class 10 Examination under 10+2 system of Education.</p> <p>b. The minimum physical requirements are</p> <ul style="list-style-type: none"> i. Height - 165 cm ii. Weight - 52 kg iii. Chest - Normal 81 cm - Expanded 85 cm iv. A registered MBBS doctor must certify that the candidate is medically fit to undertake the course.
Unit Strength (No. of Student)	20 (Max. Supernumeraries seats: 6)
Space Norms	1000 Sq. m (for practical Training area)
Power Norms	2 KW
Instructors Qualification for:	
(i) Health, Safety & Environment Trade	<p>Degree in Fire & Safety Engineering/Degree in Fire Science with one year experience in the relevant field.</p> <p style="text-align: center;">OR</p> <p>Post Graduate Diploma in Industrial Safety Engineering/ Fire and Industrial Safety Engineering /Post Graduate Diploma in Health, Safety & Environment with two year experience in the relevant filed.</p> <p style="text-align: center;">OR</p> <p>Defence & Para Military Forces Officer JCOs/NCOs with 10 years of experience in the relevant field.</p> <p style="text-align: center;">OR</p> <p>National Examination Board Occupational Safety and Health (NEBOSH)/Occupational Safety and Health Administrator (OSHA) Certification with one year post qualification experience in the relevant field.</p> <p style="text-align: center;">OR</p> <p>NTC/NAC in the trade of Health Safety And Environment with 3 years experience in the relevant field.</p> <p>Desirable Qualification : Preference will be given to a candidate with Craft Instructor Certificate (CIC)</p>

(ii) Employability Skill	<p>MBA OR BBA with two-year experience OR Graduate in Sociology/ Social Welfare/ Economics with two-year experience OR Graduate/ Diploma with two-year experience and trained in Employability Skills from DGT institutes.</p> <p style="text-align: center;">AND</p> <p>Must have studied English/ Communication Skills and Basic Computer at 12th/ Diploma level and above.</p> <p style="text-align: center;">OR</p> <p>Existing Social Studies Instructors duly trained in Employability Skills from DGT institutes.</p>			
List of Tools and Equipment	As per Annexure – I			
Distribution of training on hourly basis: (Indicative only)				
Total Hrs/ Week	Trade Practical	Trade Theory	Employability Skills	Extracurricular Activity
40 Hours	30 Hours	6 Hours	2 Hours	2 Hours



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5. NSQF LEVEL COMPLIANCE

NSQF level for **'Health, Safety & Environment'** trade under CTS: **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
- e. Responsibility

The Broad Learning outcome of **'Health, Safety & Environment'** trade under CTS 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

6. LEARNING/ ASSESSABLE OUTCOME

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

6.1 GENERIC LEARNING OUTCOME

1. Apply safe working practices.
2. Comply with environment regulation and housekeeping.
3. Assist in exigencies and carry out elementary first-aid during emergencies.
4. Work in a team, understand and practice soft skills, technical English to communicate with required clarity.
5. Explain energy conservation, global warming and pollution and contribute in day-to-day work by optimally using available resources.
6. Explain personnel finance, entrepreneurship and manage/organize related task in day-to-day work for personal & societal growth.

6.2 SPECIFIC LEARNING OUTCOME

SEMESTER-I

7. Plan & prepare accident prone area and methods adopted for reducing accidents with safety.
8. Identify and apply safety policy in an industry. List out the duties and implement Safety Targets, Objectives, Standards, Practices and Performances.
9. Plan, identify, marking and evaluate performance of display of explosives.
10. Prepare profile with an appropriate accuracy as per safety precaution in workshop.
11. Plan, select the construction site for visit and prepare the report.
12. Plan, Select and implement safety and Health objectives and Targets, performance standards.
13. Identify the various technique of fire and other hazards.
14. Identify, select and method of operation of fire extinguishers as per requirements.
15. Plan and execute hose & hose fittings.

16. Select and prepare the hydrant and pump system for proper application.
17. Identify, select respiratory personal protective devices and its maintenance.
18. Identify the effect, its measurement of radiation and its control on human body.

SEMESTER-II

19. Identify parameters governing the safety in construction and its impact in environment.
20. Identify the various technique of earthing fault protection.
21. Plan and apply the methods of plant design and housekeeping.
22. Verify and check of all industry Hazards in process of melting (Furnaces), Casing, and Forging.
23. Identify Types of water relay management system.
24. Clarify and execute the risk analysis exercise.
25. Select and use PPE, its care and maintenance.
26. Apply the method of bulk storage system of LPG/CNG.
27. Prepare case study major Chemical Disasters.



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7. LEARNING OUTCOME WITH ASSESSMENT CRITERIA

GENERIC LEARNING/ ASSESSABLE OUTCOME	
LEARNING/ ASSESSABLE OUTCOME	ASSESSMENT CRITERIA
1. Apply safe working practices	1.1 Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements, and according to policy.
	1.2 Recognize and report all unsafe situations according to policy.
	1.3 Identify and take necessary precautions on fire and safety hazards and report according to work policy and procedures.
	1.4 Identify, handle and store/ dispose-off dangerous goods and substances according to policy and procedures following safety regulations and requirements.
	1.5 Identify and observe policies and procedures with 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 accident/injury procedures.
	1.8 Identify and observe evacuation procedures according to site policy.
	1.9 Identify Personal Protective 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.
2. Comply with environment regulation and housekeeping	2.1 Identify environmental pollution & contribute to the avoidance of instances of environmental pollution.
	2.2 Deploy environmental protection legislation & regulations.
	2.3 Take opportunities to use energy and materials in an environmentally friendly manner.
	2.4 Avoid waste and dispose waste as per procedure.
3. Assist in exigencies and carry out elementary first-aid during emergencies.	3.1 Demonstrate elementary first-aids.
	3.2 Demonstrate safety practices to be observed in kitchen.
	3.3 Demonstrate use of personal protective dresses.
	3.4 Identify emergency exit route.
	3.5 Demonstrate fire fighting procedure using fire extinguishers.

4. Work in a team, understand and practice soft skills, technical English to communicate with required clarity.	4.1 Obtain sources of information and recognize information.
	4.2 Use documents, regulations and occupationally related provisions.
	4.3 Conduct appropriate and target oriented discussions with higher authority and within the team.
	4.4 Present facts and circumstances, possible solutions & use English and French terminology.
	4.5 Resolve disputes within the team.
	4.6 Conduct written communication.
5. Explain energy conservation, global warming, pollution, and contribute in day-to-day work by using available resources optimally.	5.1 Semester examination to test knowledge on energy conservation, global warming and pollution.
	5.2 Their applications will be assessed during execution of assessable outcome.
6. Explain personnel finance, entrepreneurship and manage/organize related task in day-to-day work for personal & societal growth.	6.1 Semester examination to test knowledge on personnel finance, entrepreneurship.
	6.2 Their applications will be assessed during execution of assessable outcome.

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SPECIFIC LEARNING/ ASSESSABLE OUTCOME	
LEARNING/ ASSESSABLE OUTCOME	ASSESSMENT CRITERIA
SEMESTER-I	
7. Plan & prepare accident prone area and methods adopted for reducing accidents with safety.	7.1 Identify the various accident prone areas.
	7.2 Demonstrate the safety belt helmets, gloves and Goggles, uses it.
	7.3 Identify and apply Accident prevention techniques.
	7.4 Use Safety belt helmet gloves, and goggles.
8. Identify and apply safety policy in an industry. List out the duties and implement Safety Targets, Objectives, Standards, Practices and Performances.	8.1 Carry out the plant safety inspection with the help of check list
	8.2 Visit to industrial unit and review of prevailing safety Practices.
	8.3 Observe prevailing safety provision, their condition, welfare measures include medical facilities, crèches and religious places.
	8.4 Awareness about various compensations and Documentation.
9. Plan, identify, marking and evaluate performance of display of explosives.	9.1 Display of explosives, their identification and marking as per explosives act.
	9.2 Hands on experience with Hand and power tools.
	9.3 Measurement of Heat, Illumination and Noise Demonstration.
	9.4 Determination of related electrical experiments.
10. Prepare profile with an appropriate accuracy as per safety precaution in workshop.	10.1 Identify various processes during production and safety
	10.2 witness construction and safety precaution observed.
11. Plan, select the construction site for visit and prepare the report.	11.1 Practices of good Housekeeping and Study of egress and safe access.
	11.2 Identify causes of accident during material handling.
	11.3 Pitching of ladders, proper use of safety belt and preparation of work permit.
12. Plan, Select and	12.1 Develop a workplace Safety and Health Policy.

	12.2 Plan safety and Health objectives and Targets, performance standards.
	12.3 Implementation and Operation Structure and responsibilities, individual responsibilities, Safety Consultation.
	12.4 Awareness and competence.
	12.5 Communication- Information coming into the organization.
13. Identify the various technique of fire and other hazards.	13.1 General causes and classification of fire, Detection of fire, extinguishing methods, fire fighting installations with and without water.
	13.2 Machine guards and its types, automation.
	13.3 High pressure hazards, safety, emptying, inspecting, repairing, hydraulic and non-destructive testing, hazards and control in mines.
14. Identify, select and method of operation of fire extinguishers as per requirements.	14.1 Identify Training Objectives and Methods, Deliver Training
	14.2 Access to Specialist advice and Services.
	14.3 Relationships within the organization, relationships outside the organization, external specialist safety and safety support.
15. Plan and execute hose & hose fittings.	15.1 Perform hose drill.
	15.2 Hose pick up.
	15.3 Hose laying.
	15.4 Hose joining.
	15.5 Hose replacement at different position.
16. Select and prepare the hydrant and pump system for proper application.	16.1 Identify Appropriate Action
	16.2 Risk assessment records and control .
	16.3 Familiarization and demonstration of Hydrant and its associated equipments.
	16.4 Practical pump operation, fault finding of primer failure, method of ladder pitching & climbing Application of Arm Hold and Leg Lock.
17. Identify; select respiratory personal protective devices and its maintenance.	17.1 Stages in plant life and unsafe condition in factories.
	17.2 Maintenance & safety, basics safety programming, safety department, Rules and regulation of safety department.
	17.3 Responsibility of management for safety in plant, safeguarding the public.
	17.4 Responsibility of government, Social organization and public authorities.
18. Identify the effect, its	18.1 Types and effects of radiation on human body, Measurement

measurement of radiation and its control on human body.	and detection of radiation intensity.
	18.2 Effects of radiation on human body, Measurement –disposal of radioactive waste, Control of radiation.
	18.3 Industrial noise -Sources, and its control, Effects of noise on the auditory system and health, Measurement of noise.
	18.4 Vibration - effects, measurement and control measures, Industrial Hygiene.
SEMESTER-II	
19. Identify parameters governing the safety in construction and its impact in environment.	19.1 Scope and Importance; need for public awareness about our environment.
	19.2 Economic and social security; Environment impact of transportation.
	19.3 Global warming and greenhouse effect, urbanization, acid rain.
	19.4 Demonstration of health and environment effect through chart.
	19.5 Environmental pollution — causes, Effects and control measures of air pollution, water pollution, soil pollution.
20. Identify the various technique of earthing fault protection.	20.1 Safe limits of amperages, voltages, distance from lines, etc., Joints and connections, Overload and Short circuit protection.
	20.2 Earthing standards and earth fault protection , Protection against voltage.
	20.3 Criteria in their selection, installation, maintenance .
	20.4 Borrowed neutrals, Electrical equipment in hazardous atmosphere.
21. Plan and apply the methods of plant design and housekeeping	21.1 Plant layout, design and safe distance, Ventilation and heat stress, Significance of ventilation, Natural ventilation.
	21.2 Mechanical ventilation Air conditioning.
	21.3 Safety and good housekeeping, Disposal of scrap and other trade wastes.
	21.4 Spillage prevention, Use of colour as an aid of housekeeping, Cleaning methods.
	21.5 Inspection and Checklists, Advantages of good houses.
22. Verify and check of all industry Hazards in process of melting (Furnaces), Casing, and Forging.	22.1 Demonstration of prevailing condition in industry about Drinking Water Sanitary & Washing, Cloakrooms.
	22.2 Identify Facilities for Food & Drink Shelters & Living Accommodation.
	22.3 Disaster management floods, earth quake, cyclone, and slides.
	22.4 Identify role of individual in prevention of pollution
23. Identify Types of	23.1 Maintenance of ladders and trolleys.

water relay management system	23.2 Design of turntable ladders, water tender and special equipment.
	23.3 Identify Types of water relay system.
	23.4 Arrangements of water relay system.
24. Clarify and execute the risk analysis exercise.	24.1 Definition: Incident, accident, injury, dangerous occurrences, unsafe acts, unsafe conditions, hazards, error, oversight, mistakes, etc.
	24.2 Accident Prevention: Theories / Models of accident occurrences, Principles of accident prevention.
	24.3 Accident and Financial implications, Hazard identification and analysis, fault tree analysis, Job safety analysis, examples, Plant safety inspection objectives and types check procedure inspection.
25. Select and use PPE, its care and maintenance.	25.1 Personal Protective Equipments: Need, selection, supply, use, care and maintenance, Personal protective devices for head, ear, face, eye, foot, knee and body protection, Respiratory personal protective devices.
	25.2 Cardiac massage, poisoning, wounds.
	25.3 Personal Protective Equipments: Need, selection, supply, use, care and maintenance, Personal protective devices for head, ear, face, eye, foot, knee and body protection, Respiratory personal protective devices.
26. Apply the method of bulk storage system of LPG/CNG	26.1 Identify General Consideration Types of Storage,
	26.2 Layout of storages with specific reference to LPG, CNG, Chlorine, Ammonia
27. Prepare case study major Chemical Disasters.	27.1 Preparation of Case study of Major Chemical Disasters
	27.2 Introduction to Occupational Health Hazards
	27.3 Dangerous Properties of Chemicals, Dust, Gases, Fumes, Mist, Vapours, Smoke and Aerosols,

SYLLABUS - HEALTH, SAFETY & ENVIRONMENT			
FIRST SEMESTER – 06 Months			
Week No.	Ref. Learning Outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
1-2	Apply safe working practices.	<ol style="list-style-type: none"> 1. Familiarisation with the Institute, Documentation of Student, Issuance of Dress, Books, Hostel Accommodation (If required) and Store. (06 hrs) 2. Importance of trade training, Equipments used in the trade, types of work done by the trainees in the trade. (10 hrs) 3. Introduction to safety equipments and their uses. Introduction of first aid, Road safety, operation of Electrical mains. (14 hrs) 4. Knowledge of General Safety, Occupational health and hygiene. (30 hrs) 	<p>HAZARD: Introduction to Hazard, Causes, Identification, Evaluation & Control of Hazard.</p> <p>HAZOP Analysis, Sources for Information on Hazard Evaluation.</p> <p>Preparative work (Obtain basic information, information should be converted in to suitable form, Plan the sequence & meeting schedule), Team composition & approach. Methodology, Advantages of HAZOP Study Limitation of HAZOP study</p>
3	Comply environment regulation and housekeeping	<ol style="list-style-type: none"> 2. Site visit for Hazard identification and Evaluation. (15 hrs) 3. Study of Risk at work site and preparation and initiation of reports. (15 hrs) 	<p>RISK ANALYSIS:</p> <p>Definition of Risk, Risk Analysis, Introduction to Failure Mode & Effect Analysis (FMEA), Fault Tree Analysis (FTA), Event Tree Analysis (ETA).</p>
4	Plan & prepare accident prone area and methods adopted for reducing accidents with safety.	<ol style="list-style-type: none"> 4. Visit to accident prone area Practical usages of Safety belt helmet gloves, and goggles. (30 hrs) 	<p>ACCIDENT : Definition of Accidents, Classification of Accidents, Need for the Analysis of Accidents, Methods Adopted for Reducing Accidents, Investigation of Accidents, Safety Slogans Principles of Accident(Heinrich theory), Accident ratio study, identification of unsafe</p>

			mechanical/ physical conditions, identification of unsafe acts. Frequency Rate, Prevention Methods.
5	Identify and apply safety policy in an industry. List out the duties and implement Safety Targets, Objectives, Standards, Practices and Performances.	<p>5. Carry out the plant safety inspection with the help of check list. (15 hrs)</p> <p>6. Visit to industrial unit and review of prevailing safety Practices (15 hrs)</p>	PREPARATION & ASSESSMENT OF SAFETY AUDIT : Introduction to Safety Checklist, Plant Safety Inspection, Safety Precautions adopted in the Plant, Safety Tag System, Safety Audit Report Objective of safety audit, type of audit, Audit team, Elements of safety audit, Method of audit, audit steps, concept and lay out of audit report.
6-7	-do-	<p>7. Visit to industrial unit to observe prevailing safety provision, their condition, welfare measures include medical facilities, crèches and religious places. (30 hrs)</p> <p>8. Awareness about various compensations and Documentation. (30 hrs)</p>	<p>SAFETY CONCEPT : Introduction to Safety Management, Safety Policy, Safety Committee, Safety Review, Responsibility of Management, Safety Officers Duties & Responsibilities, Safety Targets, Objectives, Standards, Practices and Performances. Motivation & Communication as part of Safety Programme. Duties & responsibility of an owner, Duties and responsibilities of a worker, Role of a supervisor Role of a safety engineer</p> <p>ILO CONVENTION : Introduction of ILO and Conventions</p>
8-9	Plan, identify, marking and evaluate performance of display of explosives.	<p>9. Display of explosives, their identification and marking as per explosives act. (15 hrs)</p> <p>10. Hands on experience with Hand and power tools. (15 hrs)</p> <p>11. Measurement of Heat, Illumination and Noise Demonstration. (15 hrs)</p> <p>12. Determination of related electrical experiments. (15 hrs)</p>	<p>FACTORIES ACT 1948 (Amended)</p> <p>:- Health - Cleanness, Disposal of Waste , Ventilation and Temperatures, Dust & Fumes, Drinking Water, Lighting, Latrines & urinals. Safety - Fencing of machineries, Work on or near machinery in motion, Hoists and lifts, Pressure plants, Floors, Stairs and means of escape, Protection against fumes & gases, Safety offers. Welfare - Washing facilities in Dry clothing, Storing, Sitting, First Aid</p>

			Appliances, Canteen, Shelters for rest & lunch, Creches, Welfare offers, Right & Obligation of workers.
10	Prepare profile with an appropriate accuracy as per safety precaution in workshop.	<p>13. Visit to work shop and steel furniture houses to witness various processes during production and safety. Precaution adopted. (15 hrs)</p> <p>14. Visit to construction site to witness construction and safety precaution observed.(15 hrs)</p>	WELFARE & TRAINING: General Provision, Drinking Water, Sanitary & Washing, Cloakrooms, Facilities for Food & Drink, Shelters & Living Accommodation, Information & Training.
11	Plan, select the construction site for visit and prepare the report.	<p>15. Construction Site Visit Practices of good House Keeping and Study of egress and safe access.(15 hrs)</p> <p>16. Construction Site Visit and identifying of causes of accident during material handling.(08 hrs)</p> <p>17. Construction Site Visit, Pitching of ladders, proper use of safety belt and preparation of work permit. (07 hrs)</p>	ENVIRONMENT PROTECTION : Safety and Protection of existing environment, Principles & Practices in Prevention & Control of Pollution, Water Pollution, Introduction to Hazardous Waste Management.
12	-do-	18. Visit to excavation Site, identification and discussion with site engineer about safety precaution taken. (30hrs)	SOCIAL SECURITY LEGISLATION: Social Security Legislation, Introduction to Workman's Compensation Act, Contract Labour Regulation Act.
13	Plan, Select and implement safety and Health objectives and Targets, performance standards.	<p>19. Developing a workplace Safety and Health Policy. (10 hrs)</p> <p>20. Planning – safety and Health objectives and Targets, performance standards. (10 hrs)</p> <p>21. Implementation and Operation Structure and responsibilities, individual responsibilities, Safety Consultation. (10 hrs)</p>	MISCELLANEOUS ACTS & RULES Explosives Act 1884 and Rules. General provision of Gas Cylinders Rules, The Building and other Construction Worker's Welfare Cess Act & Rules 1996. Environment Protection Legislation: Introduction to Prevention and Control of Pollution Act 1981 and 1982, Environment Protection Act 1986

14-15	-do-	<p>22. Awareness and competence. (15 hrs)</p> <p>23. Communication- Information coming into the organization. (15 hrs)</p> <p>24. Information Flow within the Organization. (15 hrs)</p> <p>25. Document Control : Safety and Health System Records. (15 hrs)</p>	<p>Basic Physics and Chemistry related to Fire - Definition of Matter and energy, Physical properties of matter like Density, specific gravity, Relative density, Vapour density, Melting & Boiling point, flammable limits, latent heat, etc, Effects of density on behavior of gases, , Basics of oxidizing and reducing agents, Acids. Flammable liquids-classification and types of tanks, Dust and Explosion, Liquid and Gas Fires, LPG. UCVE,BLEVE, Slope over, Boil over, Gas laws, P-V-T relation for perfect gas.</p>
16	Identify the various technique of fire and other hazards.	<p>Fire and other Hazards :</p> <p>47. General causes and classification of fire, Detection of fire, extinguishing methods, fire fighting installations with and without water. (10 hrs)</p> <p>48. Machine guards and its types, automation. (10 hrs)</p> <p>49. High pressure hazards, safety, emptying, inspecting, repairing, hydraulic and non-destructive testing, hazards and control in mines. (10 hrs)</p>	<p>Anatomy of Fire: Definition of Combustion, Elements of Combustion, Products of Combustion, Heat of reaction and calorific value, Flash point, Fire point, Ignition temperature and spontaneous combustion. Fire Triangle, fire tetrahedron, fire pyramid, source of heat,(Chemical, mechanical, Electrical, Nuclear etc.), Classification of fire and method of fire extinguishment, oxygen and its effects on combustion, Mode of heat transfer(Conduction, Convection & Radiation).</p>
17	Identify, select and method of operation of fire extinguishers as per requirements.	<p>26. Identify Training Objectives and Methods, Deliver Training. (08 hrs)</p> <p>27. Evaluation and feedback, Specialist Advice and Services. (07 hrs)</p> <p>28. Access to Specialist advice and Services. (07 hrs)</p> <p>29. Relationships within the organization, relationships Outside the organization, external specialist safety and safety support. (08 hrs)</p>	<p>Classification of Fire & Extinguishers : Classification of Fire and types of extinguishers, maintenance, method of operation, Halon and its detrimental effect on environment. Alternatives of Halon. Types of fire extinguishing agents, Rating system for portable fire extinguishers, Limitation of fire extinguishers, inspection requirement.</p>

18	Plan and execute hose & hose fittings.	<p>30. Hose drill</p> <ol style="list-style-type: none"> a) hose pick up b) hose laying c) hose joining d) hose replacement at different position (30 hrs) 	<p>HOSE & PUMPS, WATER TENDER : Fire Service Hose & Hose Fittings, Fixed Fire Fighting Installations Ropes & lines, Practical Fireman ship, Small & Special Gears, Water Tender. Types of fire hoses, its construction, caused of decay care& maintenance Types of hose fittings, identification and use of hose fittings. Types of FFF installations Testing care & maintenance</p>
19	Select and prepare the hydrant and pump system for proper application.	<ol style="list-style-type: none"> 31. Identify Appropriate Action. (05 hrs) 32. Risk assessment records and control. (05 hrs) 33. A simple Risk estimation example – Hazards, remedial measures. (05 hrs) 34. Motivation of employees, Insurance coverage of Industrial plant & personnel. (05 hrs) 35. Familiarization and demonstration of Hydrant and its associated equipments. (05 hrs) 36. Practical pump operation, fault finding of primer failure, method of ladder pitching & climbing Application of Arm Hold and Leg Lock. (05 hrs) 	<p>HYDRANT, DETECTORS & LADDERS: Introduction to Hydrant & Hydrant Fittings, Water Supply requirements for fire fighting, Introductions to pump & Primers, Detectors & Ladders.</p>
20-21	Identify; select respiratory personal protective devices and its maintenance.	<ol style="list-style-type: none"> 37. Stages in plant life and unsafe condition in factories. (15 hrs) 38. Maintenance & safety, basics safety programming, safety department, Rules and regulation of safety department. (15 hrs) 39. Responsibility of management for safety in plant, safe guards the public. (15 hrs) 	<p>BREATHING SETS: Classification of Respiratory Personal Protective Devices, Selection of Respiratory Personal Protective Devices, Instruction & Training in the use, Maintenance and Care of Self Containing Breathing Apparatus. RESUSCITATION & FIRST AID: Burns, Fractures, Toxic Ingestion, Bleeding, Wounds and Bandaging, Artificial Respiration, Techniques of Resuscitation.</p>

		40. Responsibility of government, Social organization and public authorities. (15 hrs)	
22	Identify the effect, its measurement of radiation and its control on human body.	<p>Radiation and Industrial Hazards:</p> <p>41. Types and effects of radiation on human body, Measurement and detection of radiation intensity. (08 hrs)</p> <p>42. Effects of radiation on human body, Measurement –disposal of radioactive waste, Control of radiation. (07 hrs)</p> <p>43. Industrial noise -Sources, and its control, Effects of noise on the auditory system and health, Measurement of noise. (08 hrs)</p> <p>44. Vibration - effects, measurement and control measures, Industrial Hygiene. (07 hrs)</p>	
23-24	Project Work/ Industrial Visit		
25	Revision		
26	Examination		

Note: -

1. *Instructor may design their own project and also inputs from local industry may be taken for designing such project.*
2. *The project should broadly cover maximum skills in the particular trade and must involve some problem solving skill. Emphasis should be on Teamwork: Knowing the power of synergy/ collaboration, work to be assigned in a group (Group of at least 4 trainees). The group should demonstrate Planning, Execution, Contribution and Application of Learning. They need to submit Project report.*
3. *If the instructor feels that for execution of specific project more time is required than he may plan accordingly to produce components/ sub-assemblies in appropriate time i.e., may be in the previous semester or during execution of normal trade practical.*

SYLLABUS - HEALTH, SAFETY & ENVIRONMENT

SECOND SEMESTER – 06 Month

Week No.	Ref. Learning outcome	Professional Skills (Trade Practical) With Indicative Hours	Professional Knowledge (Trade Theory)
27-30	Identify parameters governing the safety in construction and its impact in environment.	<p>46. Scope and Importance; need for public awareness about our environment. (12 hrs)</p> <p>47. Economic and social security; Environment impact of transportation. (12 hrs)</p> <p>48. Environmental impact assessment (EIA) — purpose, procedure and benefits of EIA; Biodiversity and its conservation. (12 hrs)</p> <p>49. Global warming and greenhouse effect, urbanization, acid rain. (09 hrs)</p> <p>50. Demonstration of health and environment effect through chart. (30 hrs)</p> <p>51. Case studies, population explosion, family welfare programmers-HI V/AIDS, women and child welfare. (20 hrs)</p> <p>52. Environmental pollution — causes, Effects and control measures of air pollution, water pollution, soil pollution. (20 hrs)</p>	<p>BASIC PHILOSOPHY OF SAFETY: Peculiarities & Parameters governing the safety in construction e.g. Site Planning, Layout, Safe Access / Egress.</p> <p>CONSTRUCTION INDUSTRY: General safety precautions related to construction industry, Safety in the use of Construction Machinery.</p> <p>INDUSTRIAL LIGHTING: Introduction to Lighting, Ventilation, Heat Stress, Cold Stress, Noise & Vibration.</p>
31	Identify the various technique of earthing fault protection.	<p>Electrical Hazards and Hazards in Construction Industry :</p> <p>53. Safe limits of amperages, voltages, distance from lines, etc., Joints and connections, Overload and Short circuit protection. (08 hrs)</p>	<p>ELECTRICAL SAFETY: Electrical Hazards, Static Electricity. Identification and Zoning of Hazardous area, Classification of products,</p>

		<p>54. Earthing standards and earth fault protection , Protection against voltage fluctuations, Effects of shock on human body Hazards from Borrowed neutrals. (07 hrs)</p> <p>55. Electrical equipment in hazardous atmosphere. (08 hrs)</p> <p>56. Criteria in their selection. Installation, maintenance. (07 hrs)</p>	
32-33	Plan and apply the methods of plant design and housekeeping	<p>Plant design and Housekeeping:</p> <p>57. Plant layout, design and safe distance, Ventilation and heat stress, Significance of ventilation, Natural ventilation. (15 hrs)</p> <p>58. Mechanical ventilation Air conditioning. (10 hrs)</p> <p>59. Safety and good housekeeping, Disposal of scrap and other trade wastes. (15 hrs)</p> <p>60. Spillage prevention , Use of colour as an aid of housekeeping, Cleaning methods. (10 hrs)</p> <p>61. Inspection and Checklists, Advantages of good houses. (10 hrs)</p>	EXCAVATIONS, DEMOLITIONS & STRUCTURAL FRAMES: Safety related to Excavation, Demolitions Frame Work & Concrete Work, Pile Driving and Work over Water
34	Verify and check of all industry Hazards in process of melting (Furnaces), Casing, and Forging.	62. Demonstration of prevailing condition in industry about Drinking Water Sanitary & Washing, Cloakrooms Facilities for Food & Drink Shelters & Living Accommodation. (30 hrs)	SAFETY IN MELTING, BOILERS: Hazards in process of melting (Furnaces), Casing, and Forging. Automatic Manufacturing Activity - Machining, Chipping, Grinding, Safety Precautions in use of Boilers.
35	-do-	63. Disaster management floods, earth quake, cyclone, andslides, role of individual in prevention of pollution. (30 hrs)	PRECAUTIONS IN PROCESSES: Precautions in processes and operations involving Explosive, Toxic Substances, Dusts, Gases, Vapour Clouds Formation and

			Combating, Workplace Exposure Limit, Control Measures.
36-38	Identify Types of water relay management system	<p>64. Maintenance of ladders and trolleys. (25 hrs)</p> <p>65. Design of turntable ladders, water tender and special equipment. (25 hrs)</p> <p>66. Identify Types of water relay system. (20 hrs)</p> <p>67. Arrangements of water relay system. (20 hrs)</p>	SAFETY IN THE ENGINEERING INDUSTRY: Introduction to Machine Operations & Guarding, Safety in the use of Machines, Safety precautions while using Hand Tools & Power Tools, Selection, Maintenance & Care of Hand and power too
39-41	Clarify and execute the risk analysis exercise.	<p>Principles of accidents prevention :</p> <p>68. Definition: Incident, accident, injury, dangerous occurrences, unsafe acts, unsafe conditions, hazards, error, oversight, mistakes, etc. (30 hrs)</p> <p>69. Accident Prevention: Theories / Models of accident occurrences, Principles of accident prevention. (30 hrs)</p> <p>70. Accident and Financial implications, Hazard identification and analysis, fault tree analysis, Job safety analysis, examples, Plant safety inspection objectives and types check procedure inspection. (30 hrs)</p>	CHEMICAL-COMPATIBILITY & TRANSPORTATION: Chemicals Compatibility considerations, Transportation of Chemicals, Toxic / Flammable / Explosive / Radioactive Substances by all modes - safety precautions, Use of material Safety Data Sheets.
42-43	Select and use PPE, its care and maintenance.	<p>71. Body structure and Functions, Position of causality, the unconscious casualty, fracture and dislocation, Injuries in muscles and joints, Bleeding, Burns, Scalds and accidents caused by electricity, Respiratory problems, Rescue and Transport of Casualty. (20 hrs)</p> <p>72. Cardiac massage, poisoning,</p>	PERSONAL PROTECTIVE EQUIPMENT : Need for Personal Protection Equipment, Selection, Use, Care & Maintenance of Respiratory and Non-respiratory Personal Protective Equipment, Non-respiratory Protective Devices-Head Protection, Ear Protection, Face and Eye Protection, Hand Protection, Foot Protection, Body Protection.

		wounds. (20 hrs) 73. Personal Protective Equipments: Need, selection, supply, use, care and maintenance, Personal protective devices for head, ear, face, eye, foot, knee and body protection, Respiratory personal protective devices. (20 hrs)	
44	Apply the method of bulk storage system of LPG/CNG	74. Visit to LPG/ CNG storage Site. (30 hrs) 	BULK STORAGE: General Consideration, Types of Storage, Layout of storages with specific reference to LPG, CNG, Chlorine, Ammonia.
45-48	Prepare case study major Chemical Disasters.	75. Preparation of Case study of Major Chemical Disasters. (120 hrs) 	OCCUPATIONAL HAZARDS & DANGEROUS CHEMICALS: Introduction to Occupational Health Hazards & Dangerous Properties of Chemicals, Dust, Gases, Fumes, Mist, Vapours, Smoke and Aerosols, Concepts of Threshold Limit Values, Classification of Hazards CHEMICALS ACCIDENT PREVENTION & MAIOR CASE STUDIES: Major Industrial Accidents due to Chemicals (Bhopal Gas Tragedy) Emergency Planning, Major Industrial Disaster Case Studies.
49-50	Project work/ Industrial visit		
51	Revision		
52	Examination		

Note: -

- Instructor may design their own project and also inputs from local industry may be taken for designing such project.

5. *The project should broadly cover maximum skills in the particular trade and must involve some problem solving skill. Emphasis should be on Teamwork: Knowing the power of synergy/ collaboration, work to be assigned in a group (Group of at least 4 trainees). The group should demonstrate Planning, Execution, Contribution and Application of Learning. They need to submit Project report.*
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9. SYLLABUS - CORE SKILLS

CORE SKILL – EMPLOYABILITY SKILL	
First Semester	
1. English Literacy	Duration : 20 hrs Marks : 09
Pronunciation	Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)
Functional Grammar	Transformation of sentences, Voice change, Change of tense, Spellings.
Reading	Reading and understanding simple sentences about self, work and environment
Writing	Construction of simple sentences Writing simple English
Speaking/ Spoken English	Speaking with preparation on self, on family, on friends/ classmates, on known people, picture reading, gain confidence through role-playing and discussions on current happening, job description, asking about someone's job, habitual actions. Cardinal (fundamental) numbers, ordinal numbers. Taking messages, passing on messages and filling in message forms, Greeting and introductions, office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.
2. IT Literacy	Duration : 20 hrs Marks : 09
Basics of Computer	Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of the computer.
Computer Operating System	Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc. Use of Common applications.
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.
Computer Networking and Internet	Basic of Computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, WebSite, Web page and Search Engines. 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. Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.
3. Communication Skills	
	Duration : 105 hrs Marks : 07
Introduction to Communication Skills	Communication and its importance Principles of effective communication Types of communication - verbal, non-verbal, written, email, talking on phone. Non-verbal communication –characteristics, components-Para-language Body language Barriers to communication and dealing with barriers. Handling nervousness/ discomfort.
Listening Skills	Listening-hearing and listening, effective listening, barriers to effective listening, guidelines for effective listening. Triple- A Listening - Attitude, Attention & Adjustment. Active listening skills.
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.
Facing Interviews	Manners, etiquettes, dress code for an interview Do's & don'ts for an interview

Behavioral Skills	Problem solving Confidence building Attitude
Second Semester	
4. Entrepreneurship Skills	Duration : 105 hrs Marks : 06
Concept of Entrepreneurship	Entrepreneur - Entrepreneurship - Enterprises: Conceptual issue Entrepreneurship vs. management, Entrepreneurial motivation. Performance & record, Role & function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.
Project Preparation & Marketing Analysis	Qualities of a good entrepreneur, SWOT and risk analysis. Concept & Application of PLC, Sales & Distribution management. Difference between small scale & large scale business, Market survey, Method of marketing, Publicity and advertisement, Marketing mix.
Institution's Support	Preparation of project. Role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarize with the policies / programmes, procedure & the available scheme.
Investment Procurement	Project formation, Feasibility, Legal formalities i.e., Shop act, Estimation & costing, Investment procedure - Loan procurement - Banking processes.
5. Productivity	Duration : 10 hrs Marks : 05
Benefits	Personal/ Workman - Incentive, Production linked Bonus, Improvement in living standard.
Affecting Factors	Skills, Working aids, Automation, Environment, Motivation - How it improves or slows down productivity.
Comparison with Developed Countries	Comparative productivity in developed countries (viz. Germany, Japan and Australia) in select industries, e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.
Personal Finance Management	Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and insurance.
6. Occupational Safety, Health and Environment Education	Duration : 105 hrs Marks : 06

Safety & Health	Introduction to occupational safety and health Importance of safety and health at workplace.
Occupational Hazards	Basic hazards, chemical hazards, vibroacoustic hazards, mechanical hazards, electrical hazards, thermal hazards. occupational health, occupational hygiene, occupational diseases/ disorders & its prevention.
Accident & Safety	Basic principles for protective equipment. Accident prevention techniques - control of accidents and safety measures.
First Aid	Care of injured & sick at the workplaces, First-aid & transportation of sick person.
Basic Provisions	Idea of basic provision legislation of India. Safety, health, welfare under legislative of India.
Ecosystem	Introduction to environment. Relationship between society and environment, ecosystem and factors causing imbalance.
Pollution	Pollution and pollutants including liquid, gaseous, solid and hazardous waste.
Energy Conservation	Conservation of energy, re-use and recycle.
Global Warming	Global warming, climate change and ozone layer depletion.
Ground Water	Hydrological cycle, ground and surface water, Conservation and harvesting of water.
Environment	Right attitude towards environment, Maintenance of in-house environment.
7. Labour Welfare Legislation	
Duration : 005 hrs Marks : 03	
Welfare Acts	Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's Compensation Act.
8. Quality Tools	
Duration : 10 hrs Marks : 05	
Quality Consciousness	Meaning of quality, Quality characteristic.
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.
Quality Management System	Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.
House Keeping	Purpose of housekeeping, Practice of good housekeeping.
Quality Tools	Basic quality tools with a few examples.



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LIST OF TOOLS & EQUIPMENTS			
HEALTH SAFETY AND ENVIRONMENT			
Sl. No.	Name of the Tools and Equipments	Specification	Quantity
A. TRAINEES TOOL KIT (For each additional unit trainees tool kit sl. 1-10 is required additionally)			
1.	Water CO ₂ Type Fire Extinguisher	9 Ltrs	06 Nos
2.	Stored pressure Type Fire Extinguisher	9 Ltrs	06 Nos
3.	Chemical Foam type Fire Extinguisher	9 Ltrs	06 Nos
4.	Mechanical Foam type Fire Extinguisher	9 Ltrs	06 Nos
5.	CO ₂ Type Fire Extinguisher	4.5 Kg	06 Nos
6.	BC Type Fire Extinguisher	5/10 Kg	04 Nos
7.	ABC Type Fire Extinguisher	5/10 Kg	04 Nos
8.	Extension Ladder (Size)	45/35 ft	02 Nos
9.	All types of Branches or Nozzles		04 Nos
10.	Fire Hose	a) 15 m	10 Nos
		b) 30 m	04 Nos
B. SHOP TOOLS, INSTRUMENTS – For 2 (1+1) units no additional items are required			
(i) Lists of Tools:			
11.	First Aid Box		
12.	All Types of small gears		
13.	BA Set	Negative & Positive Pressure	02 Nos
14.	a) Gas Cylinders		02 Nos
	b) Steel Back Plates		02 Nos
	c) Face Masks		02 Nos
15.	Portable Fire Pump/TFP		02 Nos
16.	All types of couplings		1 Set
17.	Hydrant-Stand Pipe Type		02 Nos
18.	Fire Trays		02 Nos
19.	Manual call point		01 No
20.	Entry Suit/ Proximity Suit		02 Nos
21.	Hose reel system		01 No
22.	Nitrogen Cylinder		01 No
23.	Hose Box		01 No
24.	Fire Fighting Point complete Set		01 No

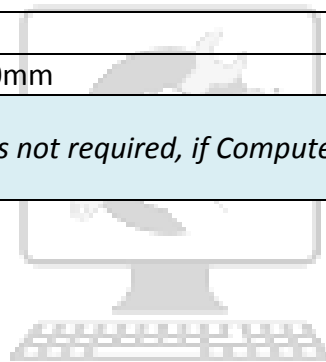
25.	Section Hose 10 ft		02 Nos
26.	Section Wrench		02 Nos
27.	Metal Strainer		02 Nos
28.	Basket Strainer		01 No
29.	Sprinkler		02 Nos
30.	Ropes	100 ft Long	01 No
31.	Lines	100 ft Long	01 No
32.	Control Panel - Model		01 No
33.	Personal Protective Equipment		
	a) Helmet (Type A,B,C)		20 Nos
	b) Laser Welding Safety Goggles		10 Nos
	c) Face Shield		10 Nos
	d) Welding Shield		10 Nos
	e) Ear Muff		10 Nos
	f) Ear Plug		10 Nos
	g) Canal Caps		10 Nos
	h) Safety Shoes		20 Nos
	i) Asbestos Gloves		10 Nos
	j) Electrical Hand Gloves		10 Nos
	k) Hand Gloves (Rubber)		10 Nos
	1) Dust Mask		10 Nos
34.	Personal Protective Clothing for men		
	a) Safety Shirt		10 Nos
	b) Safety Trouser		10 Nos
	c) Safety Jacket		10 Nos
	d) Cooling Vest		10 Nos
	e) Gum Boots		10 Nos
(ii) List of Equipment			
35.	Personal Fall Arrest System (PFAS)		02 Nos
36.	Tripod		02 Nos
37.	Pulley		02 Nos
38.	Suspended Scaffold		02 Nos
39.	Gas Detector		02 Nos
40.	Plastic Tunnel (Sewer Rescue Drill)		04 Nos
41.	Body Harness		01 No
42.	Collecting Breeching		02 Nos
43.	Dividing Breeching		02 Nos
44.	Hydrant Flange		02 Nos
45.	Hydrant Key & Bar (With hydrant Spindle)		01 No
46.	Adopter for Air Store Pressure		02 Nos
47.	Hydraulic Pressure Testing Machine		01 No

48.	Sprinklers Head (Bulb Type, Fusible Type)		02 Nos
49.	Safety Belt		01 No
50.	Computer System		06 Nos
51.	Computer Table		06 Nos
52.	Computers Chairs		06 Nos
53.	White Board		01 No
54.	L.C.D. Projectors		02 Nos
55.	UPS 650 VA offline		06 Nos
56.	All types of Detectors 1 Pes. of each		04 Nos
57.	Flux meter		06 Nos
58.	Dosi meter		01 No
59.	Cut model of Fire Extinguisher		02 Nos
60.	Fire Suit		02 Nos
61.	Fire Tender (one For the Institute) *		01 No
62.	Rescue Van (one For the Institute)*		OINO.
C. SHOP FLOOR FURNITURE AND MATERIALS - For 2 (1+1) units no additional items are required.			
63.	Instructor's table		1 No.
64.	Instructor's chair		2 Nos.
65.	Metal Rack	100cm x 150cm x 45cm	4 Nos.
66.	Lockers with 16 drawers standard size		2 Nos.
67.	Steel Almirah	2.5 m x 1.20 m x 0.5 m	2 Nos.
68.	Black board/white board		1 No.
69.	Fire Extinguisher		2 Nos.
70.	Fire Buckets		2 Nos.

काशल भारत - कुशल भारत

TOOLS & EQUIPMENT FOR EMPLOYABILITY SKILLS		
S 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	01 no.
4.	Computer Tables	10 nos.
5.	Computer Chairs	20 nos.
6.	LCD Projector	01 no.
7.	White Board 1200mm x 900mm	01 no.

Note: Above Tools & Equipments not required, if Computer LAB is available in the institute.



Skill India
 कौशल भारत - कुशल भारत

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:														
S No.	Maximum Marks (Total 100 Marks)		15	5	10	5	10	10	5	10	15	15	Total Internal Assessment Marks	Result (Y/N)
	Candidate Name	Father's/Mother's Name	Safety Consciousness	Workplace Hygiene	Attendance/ Punctuality	Ability to Follow Manuals/ Written Instructions	Application of Knowledge	Skills to Handle Tools & Equipment	Economical Use of Materials	Speed in Doing Work	Quality in Workmanship	VIVA		
1														
2														