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

COMPETENCY BASED CURRICULUM

FIREMAN

(Duration: Six Months)
Revised in July 2022

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 3

SECTOR – PRIVATE SECURITY

Directorate General of Training

FIREMAN

(Non-Engineering Trade)

(Revised in July 2022)

Version: 2.0

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL - 3

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

www.cstaricalcutta.gov.in

CONTENTS

1. COURSE INFORMATION

A fireman is the responder, who notices, recognizes risks and emergencies that are harmful to life, property and premises. Fireman is responsible for monitoring premises through physical presence by following laid down procedures and use effective rescue & firefighting techniques to save property and human lives.

The primary role of the Fireman is to rescue & mitigate emergency and control fire situations by using appropriate fire-fighting equipment and safety devices. The core responsibility is to extinguish fire, rescue of trapped personnel and respond to various manmade and natural emergencies.

The duration of the fireman trade is 6 months. During this six-month period candidate is trained on professional skill, professional knowledge and employability skill related to job role. The practical skills are imparted in simple to complex manner & simultaneously theory subject is taught in the same fashion to apply cognitive knowledge while executing task.

The practical firefighting part starts with basics of fire safety, carry out first aid firefighting, recognize and operate firefighting systems, maintain and test tools and equipment, respond to fire and other hazards, carry out rescue and first aid, able to do risk assessment and maintain safety of self and others at the end of the course.

The broad components covered under Professional skill subject are as below: -

1. Fire Terminology
2. Safety and Protective equipment
3. Fire Discipline, Fire communication, IT, Fire administration, and office procedures.
4. Hazardous materials.
5. Stages of Fire, Classification of Fire, Basic Chemistry of Fire and Fire Behaviour.
6. Types of Fire suppression/extinguishing media.
7. Fire Prevention and public education.
8. Self contained Breathing Apparatus (SCBA).
9. Types of Fire Streams.
10. Hose, Hydrant, nozzles – Drills and theory. Types of Fire Pumps and Fire Pump drills Types of Fire Extinguisher and Firefighting equipment.
11. Ladders – Theory and drills.
12. Technical Rescue and Medical First responder.
13. Fire ground operations.
14. Practical application of Active and Passive Fire Protection and suppression systems
15. Confined Space – Standby duty, Rescue operations Fire Fighting and entry awareness.

16. Different types of work procedures in industries –Fire protection and standby during Hot work.
17. Inspection, Maintenance, Servicing and Hydrostatic testing of fire Extinguisher and Fire equipment.
18. Salvage and overhaul.

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 economy/ Labour market. The vocational training programmes are delivered under the aegis of Directorate General of Training (DGT). Craftsman Training Scheme (CTS) with variants and Apprenticeship Training Scheme (ATS) are two pioneer schemes of DGT for strengthening vocational training.

Fireman trade under CTS is one of the newly designed courses delivered nationwide through network of ITIs. The course is of six months duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory & Practical) imparts professional skills and knowledge, while Core area (Employability Skills) imparts requisite core skill, knowledge and life skills. After passing out the training program, the trainee is awarded National Trade Certificate (NTC) by DGT which is recognized worldwide.

Candidates need broadly to demonstrate that they are able to:

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

2.2 PROGRESSION PATHWAYS

- Can join industry as Fireman and will progress further as Senior Fireman, Supervisor and can rise up to the level of Manager.
- Can become Entrepreneur in the related field.
- Can join Apprenticeship programme in different types of industries leading to National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.
- Can join Advanced diploma (Vocational) courses conducted by DGT as applicable.

2.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of six months: -

S No.	Course Element	Notional Training Hours
1.	Professional Skill (Trade Practical)	420
2.	Professional Knowledge (Trade Theory)	120
3.	Employability Skills	60
	Total	**600**

2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of course through formative assessment and at the end of the training programme through summative assessment as notified by the DGT from time to time.

a) The **Continuous Assessment** (Internal) 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 formative assessment template provided on www.bharatskills.gov.in.

b) The final assessment will be in the form of summative assessment. The All India Trade Test for awarding NTC will be conducted by **Controller of examinations, DGT** as per the guidelines. The pattern and marking structure is being notified by DGT 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

For the purposes of determining the overall result, weightage of 100% is applied for six months and one year duration courses and 50% weightage is applied to each examination for two years courses. The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%. There will be no Grace marks.

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 some of 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
- Computer based multiple choice question examination
- Practical examination

Evidences and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examining body. The following marking pattern to be adopted for formative assessment:

Performance Level	Evidence
(a) Marks 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	• Demonstration of good skills and accuracy in the field of work/ assignments. • A fairly good level of neatness and consistency to accomplish job activities. • Occasional support in completing the task/ job.
(b) Marks 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	• Good skill levels and accuracy in the field of work/ assignments.

standard of craftsmanship, with little guidance, and regard for safety procedures and practices	● A good level of neatness and consistency to accomplish job activities. ● Little support in completing the task/job.
(c) Marks in the range of more than 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 and accuracy in the field of work/ assignments. ● A high level of neatness and consistency to accomplish job activities. ● Minimal or no support in completing the task/ job.

3. JOB ROLE

Fire Fighter; Fireman (Fire Service), fights fires as member of firefighting force using firefighting equipment to extinguish fire, rescue people and property from fire and performs sentry duty. Visits scene of fire on motor vehicle equipped with firefighting material, water pumps etc. on receipt of fire information. Connects and mans hose to spray water or chemicals on fire, or uses portable fire extinguisher in places not accessible with hose. Demolishes parts of buildings or other structure as necessary, to clear passage and to prevent further spread of fire. Rescues trapped persons and administers artificial respiration to those overcome by heat or fire. Maintains firefighting equipment in perfect condition and performs sentry duty at fire station according to roster. May perform other services during emergencies or natural calamities such as flood, storm by rescuing people in danger, manning hoses to assist police to control rioters, extricating persons or animals from places not easily accessible etc. May drive fire truck. May undertake minor repairs to equipment.

Reference NCO-2015:

(i) 5411.0100 – Fire Fighter

Reference NOS:

i) MEP/N7301
ii) MEP/N7303
iii) MEP/N7302
iv) MEP/N7304
v) MEP/N7305

vi) MEP/N9411
vii) MEP/N9412
viii) MEP/N9413
ix) MEP/N9414
x) MEP/N9415
xi) MEP/N9416

4. GENERAL INFORMATION

Name of the Trade	**FIREMAN**
Trade Code	DGT/2008
NCO - 2015	5411.0100
NSQF Level	Level - 3
NOS Covered	MEP/N7301 MEP/N7303 MEP/N7302 MEP/N7304 MEP/N7305, MEP/N9411, MEP/N9412, MEP/N9413, MEP/N9414, MEP/N9415, MEP/N9416
Duration of Craftsmen Training	Six Months (600 Hours)
Entry Qualification	Passed class 10th Class Examination **The minimum physical requirements:** 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.
Minimum Age	14 years as on first day of academic session.
Eligibility for PwD	LD
Unit Strength (No. of Student)	24 (There is no separate provision of supernumerary seats)
Space Norms	1000 Sq. m
Power Norms	2 KW
Instructors Qualification for:	
(i) Fireman Trade	B.Voc/Degree in Fire & Safety Engineering/ Fire Science from AICTE/UGC recognized university with one year experience in the relevant field. **OR**

	Advanced / Post Graduate Diploma (Minimum 2 years) in Industrial Safety Engineering/ Fire and Industrial Safety Engineering/ Health, Safety & Environment from recognized board of education or relevant Advanced Diploma (Vocational) from DGT with two year experience in the relevant field. **OR** Defense & Para Military Forces Officer/ JCOs/NCOs with 10 years of experience in the relevant field. **OR** Sub officer/STO/DO course from NFSC, Nagpur (only)with 5 years experience in the relevant field. **OR** NTC/NAC passed in the trade of "Fire Technology and Industrial Safety Management" with 3 years experience in the relevant field. **<u>Essential Qualification</u>:** Relevant Regular/RPL variants of National Craft Instructor Certificate (NCIC) under DGT. ***Note: Out of two Instructors required for the unit of 2 (1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications. However both of them must possess NCIC in any of its variants.***
(ii) Employability Skill	MBA/ BBA / Any Graduate/ Diploma in any discipline with Two years' experience with short term ToT Course in Employability Skills. (Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above) **OR** Existing Social Studies Instructors in ITIs with short term ToT Course in Employability Skills.
(iii) Minimum Age for Instructor	21 Years
List of Tools and Equipment	As per Annexure – I
Distribution of training on hourly basis: (Indicative only)	

5. LEARNING OUTCOME

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

5.1 LEARNING OUTCOMES (TRADE SPECIFIC)

1. Identify different types of fire, select & perform various Hose drill following safety precautions. (MEP/N7301, MEP/N7303)
2. Plan and perform fire fighting by using various types of fire extinguishers. (MEP/N7302)
3. Establish the fire suppression criteria, compare & create various methods of fire extinguishment. (MEP/N9411)
4. Identify water supply system, select and perform various Hydrant drill viz., 3 men, 4 men, etc. (MEP/N7303)
5. Select & execute the functionality of ground ladder. (MEP/N9412)
6. Identify, select and make use of various small gears. (MEP/N7305)
7. Identify, Select and perform various pump drill. (MEP/N9413)
8. Select and ensure the use of Personal Protective Equipment (PPE). (MEP/N7304, MEP/N7303)
9. Classify various building construction structures and materials in relation to fire and life safety. (MEP/N9414)
10. Identify the procedure for making mechanical foam and establish its effectiveness in extinguishing class B fire. (MEP/N9415)
11. Define risk evaluation and control procedures. Identify the direct/ indirect loss, mitigation measures, use of salvage sheets and salvage equipment. (MEP/N7303)
12. Execute technical rescue, use of rope, lines and various knots. (MEP/N7305)
13. Perform first aid to casualty, give CPR and artificial respiration to the breathing arrest casualty. (MEP/N7304)
14. Measure various capacities of water bodies &hydraulics in relation to water head, friction loss, velocity and water discharge. (MEP/N9416)

6. ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
1. Identify different types of fire, select & perform various Hose drill following safety precautions. (MEP/N7301, MEP/N7303)	Select the types of suction and delivery hose.
	Identify the Causes of hose decay & its prevention.
	Perform Use of percolating & non-percolating hose.
	Identify hose reel, causes of decay and its care & maintenance.
	Identify Importance of hose reel hose in first aid fire fighting in buildings and industries.
	Plan of work in compliance with standard tests of delivery hoses.
	Perform Standard test of Suction hose.
	Identify the different groups of hose fittings and their uses.
	Measure of deep lift suction fittings.
	Type of Breaching and its uses.
	Identify the hose ramps, care and maintenance of hose fittings.
	Describe basic science and physics related to combustion.
	Describe Basic property of matter, types of matter & effect of the heat on matter.
	Define Vapour density, Relative density effect of density on the behaviour of gases.
	Define Melting & boiling point.
	Describe heat and its effect on matter, measurement Units of temperature and interchange.
	Identify Flammable liquids, gases, & vapours specific heat, latent heat.
	Define combustion, fire triangle, Fire tetra hadrons.
	Knowledge of various types of chemicals in the trade.
	Identify the type of chemicals and their hazard in the place.
	Select the suitable chemicals on the workplace.
	Analyzed the effect of chemicals on the suitable jobs.
2. Plan and perform fire fighting by using various types of fire extinguishers. (MEP/N7302)	Classify the types of fire and suitability of fire extinguisher on particular class of fire.
	Install the wall fitting and test it.
	Technique of fire extinction Smothering Cooling and Starvation.
	Observe the halon and its detrimental effect on Environment.
	Observe the safety/precaution during the operation of Extinguisher.
	Store pressure type and Cartridge type fire extinguishers
	Working principle of DCP, CO2, Mechanical Foam and Water type fire extinguishers.

3. Establish the fire suppression criteria, compare & create various methods of fire extinguishment. (MEP/N9411)	Ascertain the fire prevention measures and its importance in preventing fires.
	Identify and ascertain the trade tools practice their uses with prevention jobs, care & maintenance.
	Assign roles and responsibilities of the co-trainees for execution of the task effectively and monitor the same.
	Identify trade equipment and their uses.
	Classify the types and method of operation of Fire Extinguishers.
	Operate of the fire extinguisher as following PASS method.
	Identify the suitability of fire extinguishers.
	Carry out care & maintenance of fire extinguishers.
	Carry out care & maintenance of all Fixed Fire Fighting Installations.
	Observe general safety precaution and occupational Health and hygiene.
	Identify the hazards other than fire in the work place.
	Know the ERP of the work place.
	Brief the reporting system within organization & work place.
	Ensure emergency Exit routes.
	Know the procedure of control, containment and confinement procedures.
	Classify the water based and non-water based fixed fire fighting systems.
	Classify the Types of water sprinkler systems, fusible link sprinkler, Quartzoid bulb sprinkler, drenchers etc.
4. Identify water supply system, select and perform various Hydrant drill viz., 3 men, 4 men, etc. (MEP/N7303)	Identify Water main, Risers, Down comer.
	Identify the functional application of Deluge valve system.
	Describe the fixed Foam Installations.
	Identify the importance of Foam pourer in tank protection.
	Identify the main water discharging sources, Hydrants, Monitors, HVWS, MVWS, HVLR.
	Describe the total flooding system I.e. CO2, FM-200.
5. Select &execute the functionality of ground ladder. (MEP/N9412)	Describe the ladder used in fire services.
	Brief the method of Pitching, ascending and descending the ladder.
	Perform leg lock and arm hold.
	Perform the standard test of the strings, rounds and extending line.
6. Identify, select and make use of various small gears. (MEP/N7305)	Classification of small gears.
	Select and use various cutting and breaking tools.
	Select special types of small gears.
	Perform testing and care and maintenance of small gears.

7. Identify, Select and perform various pump drill. (MEP/N9413)	Classify the common type of pumps.
	Methods of priming.
	Select and testing fault finding.
	Introduction to centrifugal pump.
	Observe care maintenance and testing criteria of pump.
8. Select and ensure the use of Personal Protective Equipment (PPE). (MEP/N7304, MEP/N7303)	Assign the personal protection equipment, their proper selection and their uses.
	Prepare care & maintenance respiratory and non respiratory Personal protective equipment.
	Explain the head protection, ear protection, Face & eye protection, hand protection, Foot protection& Body protection.
	Explain various types of respiratory PPE, types of breathing apparatus, SCBA- function of all parts, uses and donning & doffing of SCBA.
9. Classify various building construction structures and materials in relation to life safety. (MEP/N9414)	Classification of buildings as per NBC.
	Execute building materials & their behaviour under fire conditions.
	Knowledge of various types of occupancies and fire load, fire fighting techniques.
	Classification and Zoning of Building according their Fire Load.
	Create of importance of fire escapes with respect to their Positioning.
	Nos. of fire escape, escape routes and travelling distance.
	Pressurization and illumination in escape route.
	Arrange the reference to NBC part IV fire construction and provisioning of passive fire fighting technique.
10. Identify the procedure for making mechanical foam and establish its effectiveness in extinguishing class B fire(MEP/N9415)	Classify the types of foam concentrates.
	Prepare & test foam making equipment-(mechanical foam).
	Knowledge of high expansion and low expansion foam. Special uses of Medium & High expansion foam.
	Plan & prepare storage of foam compound. Preservation of Foam Concentrations.
	Type & Application of dry chemical powder.
	Identify the compatibility of Dry Powder with foam
	Know the application ratio of foam
	Calculate the requirement of total foam compound and water.
11. Define risk evaluation and control procedures. Identify the direct/ indirect loss, mitigation measures, use of	Explain the direct and indirect loss due to fire incidents
	Execute the mitigation measures for indirect loss.
	Use of various Salvage sheets.
	Ascertain the care; maintenance and testing of salvage equipment.
	Knowledge of occupational health hazards & dangerous properties

salvage sheets and salvage equipment. (MEP/N7303)	of chemicals.
	Analyzed the Dust Gases, Fumes, Mist, Vapours, Smoke and Aerosols.
	Concepts of threshold limit value.
	Classify Hazards.
12. Execute technical rescue, use of rope, lines and various knots. (MEP/N7305)	Establish the risk assessment techniques.
	Describe Ropes & Lines.
	Identify the knots and hitches.
	Ascertain the testing of different types of lines.
	Familiarization and practice with various rescue knots.
	Prevent deterioration and damage to ropes & lines.
	Perform rescue casualty from various situations, water rescue, rescue from height, rescue from rift, rescue from sewer, rescue from lift, rescue from well and animal rescue.
	Identify the various tools and equipment use for rescue.
13. Perform first aid to casualty, give CPR and artificial respiration to the breathing arrest casualty. (MEP/N7304)	Take the casualty in to the safe environment.
	Check properly and render first aid accordingly.
	Execute CPR if casualty found cardiac arrest
	Execute artificial respiration in case of breathing arrest
14. Measure various capacities of water bodies and hydraulics in relation to water head, friction loss, velocity and water discharge. (MEP/N9416)	Apply Method of carrying stretcher with casualty.
	Select and apply the method of hydraulic test for fire extinguisher and SCBA set.
	Identify the Method of standard test of ladder and small gears
	Calculate capacity of tanks of given shapes and sizes.

7. TRADE SYLLABUS

SYLLABUS FOR FIREMAN TRADE			
DURATION: SIX MONTHS			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
Professional Skill 45 Hrs; Professional Knowledge 12 Hrs	Identify different types of fire, select & perform various Hose drill following safety precautions. (Mapped NOS: MEP/N7301, MEP/N7303)	1. Familiarization with the institute, Documentation of student, issuance of Dress, Books, Hostel Accommodation (if required) and Store. (04 hrs) 2. Importance of trade training, equipment used in the trade, types of work done by the trainees in the trade. (03 hrs) 3. Introduction to safety equipment and their uses. (04 hrs) 4. Introduction of First Aid, Road safety, operation of electrical mains. (04 hrs) 5. Associated Safety Hazards & risk, Occupational Health Hazards and associated environment related issue. (03 hrs)	All necessary guidance to be provided to the new comers to become familiar with the topography & working of Industrial Training Institute system including stores procedures. Discipline: Introduction, General principles of discipline, essentials for discipline and outward signs. (06 hrs.)
		6. Physical Exercise & Squad drill. (08 hrs) Hose Drill 7. Lifting the hose by number. (02 hrs) 8. Lowering the hose by number. (02 hr) 9. Demonstration of the properties of various.	Basics of Physics & Chemistry related to Fire Physical properties of matter, Definition of Density, Relative density, Effects of density on behaviour of gases, Vapour Density, Melting & Boiling point, introduction to Heat and Combustion, Measurement of temp and conversion of their

		➢ Acids ➢ Alkalies ➢ Gases ➢ Organic flammable liquids and commonly used industrial chemical (05hrs) (07hrs) **Hose Drill** 10. Laying out the hose. (04 hrs) 11. Under running the hose. (02 hr) 12. Recoiling the hose. (02hr)	scales, definition of Flammable liquids, Gases & vapours, specific heat, latent heat. Anatomy of Fire: Definition of Combustion, Elements of Combustion, Products of combustion. Fire triangle and fire tetra hadrons, Flash point, Fire point, Ignition Temperature, spontaneous combustion. Flammability Range. Transfer of heat. Measurement of heat and conversion of heat measuring units. (06 hrs.)
Professional Skill 36 Hrs**;** Professional Knowledge 12 Hrs	Plan and perform firefighting by using various types of fire extinguishers. (Mapped NOS: MEP/N7302) Establish the fire suppression criteria, compare and create various methods of fire extinguishment. (Mapped NOS: MEP/N9411)	13. Physical Exercise & Squad drill. (12 hrs) **Extinguisher drill** 14. Method of Lifting the extinguisher. (08 hrs) 15. Method of operation of extinguisher. (08 hrs) 16. Method of refilling of extinguisher. (08 hrs)	Classification of Fires: Classification of fire as per Indian standards and NFPA code, introduction and function of Fire extinguishing ball, drone and robot. and types of extinguisher, maintenance, method of operation. Techniques of fire extinction-Smothering, Cooling and Starvation. Care and maintenance of Fire Extinguishers. Introduction to Class K Fire (06 hrs.) Hose and Hose Fittings: Type of suction & Delivery Hoses, Material used in Construction. Hose-reel, and causes of decay, operational use of Hose, Storage, Care & Maintenance, Repairing and Binding of Hose, Coupling and collecting head adapters, nozzles and other miscellaneous tools and equipment. (06 hrs.)
Professional Skill 36 Hrs;	Identify water supply system, select and perform	17. Physical Exercise & Squad drill (12 hrs) **Hydrant drill**	Source of water supply: Construction, Capacity and use, Open source - Pounds, Rivers,

Professional Knowledge 12 Hrs	various Hydrant drill viz., 3 men, 4 men, etc. (Mapped NOS: MEP/N7303)	18. Method of hose connection (08 hrs) 19. Method of handling the hose (08 hrs) 20. Method of under running and recoiling the hose (08 hrs)	Streams, Sea, hydrant types &uses. Over Head Tanks Capacity and use. Water Relay:- Types of relay-system, water distribution system. Advantages and disadvantages, calculation of hose. (06 hrs.)
			Ladders: Introduction of Types of ladders, Extension Ladder, Hook Ladder, Use, Care and maintenance of ladders. Pitching of Ladders parts and components. (06 hrs.)
Professional Skill 60 Hrs; Professional Knowledge 18 Hrs	Select & execute the functionality of ground ladder. (NOS:MEP/N9412) Identify, select and make use of various small gears. (Mapped NOS: MEP/N7305)	21. Physical Exercise & Squad drill (09 hrs) **Ladder drill** 22. Close up to the ladder (07 hrs) 23. Method of carrying the ladder (08 hrs) 24. Method of pitching the ladder (06 hrs)	Small & Special Rescue Gears: Different types of small gears, Fireman Axe, Ceiling Hook, Crowbar, Door Breaker, Padlock equipment and different type of Saw used during fire fighting& rescue techniques. Care, maintenance & testing of small gears. (06 hrs.)
			Breathing Apparatus set: Introduction of BA Set, Types of BA Sets in use, Components and function/ working principles of normal compressed air BA set and its station maintenance. (06 hrs.)
		25. Physical Exercise &Squad drill. (09 hrs) **Ladder drill** 26. Method of pitching the ladder (07 hrs) 27. Method of ascending and descending the ladder with application of leg lock and arm hold. (08 hrs) **Practice of rescue knots** 28. Practice of tying rescue knots. (06 hrs)	Rope and Knots: Construction and fiber used for Ropes, types and use of Lines, causes of deterioration, inspection and test, methods of testing, care and maintenance, standard knots and their uses. (06 hrs.)

Professional Skill 60 Hrs; Professional Knowledge 18 Hrs	Identify, Select and perform various pump drill. (NOS:MEP/N9413) Select and execute the use of Personal Protective Equipment (PPE). (Mapped NOS: MEP/N7304, MEP/N7303) Classify various building construction structures and materials in relation to fire and life safety. (NOS:MEP/N9414)	29. Physical Exercise & Squad drill. (11 hrs) **Pump drill** 30. Close up the pump (06hrs) 31. Falling three spaces behind the pump. (06hrs) 32. Practice of equipment hauling & lowering knots. (07 hrs)	Building Construction: Building Materials and their behaviour under fire conditions, singes of building collapse and rescue operation, importance of fire escapes with respect their positioning for construction and provisioning of fire fighting measures.AS per NBC. Personal Protective Equipment (PPE):-- Need for Personal Protective Equipment, Selection, Use, Care & Maintenance, Respiratory and Non-respiratory PPEs. (06 hrs.)
		33. Physical Exercise & Squad drill. (09 hrs) **Pump drill** 34. Method of connecting suction hose. (06hrs) 35. Method of laying out two line, three length each. (07hrs) 36. Method of priming and operation of pump. (08 hrs)	Pump and Primers: Classification of common pumps in use in Fire Service and its types , centrifugal pump, its parts, construction & their function, different types of primers, Reciprocating and Gas Ejector primers, Care and Maintenance, introduction to Cooling System & its importance. (06 hrs.)
			Fixed Fire Fighting Installations: A. Water Based- Riser mains- Wet Riser, Dry Riser, Hose reel installation, use and maintenance, introduction to hydrants, monitors, B. Non-water based- Foam based, Foam pourer, DCP, CO2, based installations use and maintenance. (06 hrs.)
Professional Skill 42 Hrs; Professional Knowledge 12 Hrs	Identify the procedure for making mechanical foam and establish its effectiveness in extinguishing class B fire. (NOS:MEP/N9415)	37. Physical Exercise & Squad drill. (12 hrs) **Foam drill** 38. Performing foam drill using medium expansion foam generator. (08 hrs) 39. Performing foam drill using variable	Electricity & fire Hazards: General introduction, Fundamentals of electricity, Common Causes of electrical fires and its remedial measures, Electrical Hazards, protective measures and fire fighting procedure. Foam & Foam making

		inductors. (08 hrs) 40. Performing foam drill using round the pump proportioner. (09 hrs) 41. Performing foam drill using Knap shank tank and FB2. (05 hr)	equipment: Water as an extinguishant- its merit-demerits and modification. Introduction to all types of foam concentration, properties of foams and techniques of extinguishment, types of foam, characteristics of good foam, foam making equipment- Mechanical High expansion, medium expansion and Low expansion foam, Storage of foam compound. (06 hrs.)
			Fire Fighting Appliances: Special features of water tender and special types of fire tenders(Foam tender, DCP Tender, CO2 tender, Multipurpose tender) Introduction of Portable fire pump, capacity, use and maintenance. Fire tenders, types use and maintenance. Foam Tender- General requirements, use, Operation, maintenance and test special Appliances. (TTL, HEP, RIV, Rescue van) (06 hrs.)
Professional Knowledge 06 Hrs	Define risk evaluation and control procedures. Identify the direct/ indirect loss, mitigation measures, use of salvage sheets and salvage equipment. (Mapped NOS: MEP/N7303)		Practical Fireman ship: Duties & responsibilities of fire crew at a fire station & Fire Ground Methods of entry, Rescue & fire fighting in smoke logged building. Salvage work- Direct/ indirect loss, Mitigation measures, Salvage seats and other special equipment. Application of various types of fire fighting methods. (Defensive, Offensive). (06 hrs.)
Professional Skill 38 Hrs; Professional	Execute technical rescue, use of rope, lines and various knots.	42. Physical Exercise & Squad drill. (12 hrs) **B A Set drill** 43. Identify SCBA set (05	Special Services Calls: Introduction, Methods employed by fire service to rescue trapped persons in lifts, sewer, trapped

Knowledge 06 Hrs	(Mapped NOS: MEP/N7305)	hrs) 44. Donning & doffing. (07 hrs) 45. Performing low pressure &high pressure pre-entry test. (07 hrs) 46. Performing care, maintenance and testing of SCBA and its components. (07 hrs)	under vehicle, Debris of collapsed building and Wells, Rescue of human being animals from pounds & Rivers. (06 hrs.)
Professional Skill 53 Hrs; Professional Knowledge 12 Hrs	Perform first aid to casualty, give CPR and artificial respiration to the breathing arrest casualty. (Mapped NOS: MEP/N7304)	47. Physical Exercise & Squad drill. (08 hrs) **Rescue Procedures** 48. Method of rescue casualty without equipment a- Carry casualty. (06 hrs) b- Dragging casualty. (06 hrs) **Practice of CPR** 49. Performing cardiac pulmonary resuscitation. (06 hrs)	Medical First Aid: Definition of first-aid, Quality of First Aider, Shock-sign and symptoms, Asphyxia Sign and symptoms, Wound and Hemorrhage - Classification of injuries, signs, symptoms and management of Burn, its severity, Scalds and frost bites, signs and symptoms of management of heart attack. Fractures - Causes, types, Signs and symptoms, management, sprain and dislocation - Sign & symptoms management & observation of patient, Snake Bites- treatment & management, resuscitation - different methods. (06 hrs.)
		50. Physical Exercise & Squad drill. (07 hrs) **Rescue Procedures** 51. Practice of Holger Neilson method. (03 hrs) 52. Practice of Shepherd method. (03 hrs) 53. Practice Sylvester method. (02hrs) 54. Practice mouth to mouth and mouth to nose method. (02hr) 55. Physical Exercise & Squad drill. (02 hrs) 56. Writing practices of	Fire Service Organization: Introduction of Fire Service Organization, Writing and importance of occurrence book. Duty Card/ Register, fire reports, Log books, Hose Book, Stock Registers, Leave Register, Workshop order book, Defaulter Register etc. Station discipline and watch room Control room procedure. Executive duties of fireman. Familiarization and demonstration of smoke detectors, Heat Detectors Gas Detectors.

		Occurrence Book, Duty Card/Register, Log Book, Hose Book, Stock Register. (08 hrs)	Hazardous Chemicals: Dangerous chemicals and substances, Introduction to transportation & handling of dangerous chemicals & explosives, storage of hazardous chemicals and Fire Safety & fire fighting. (06 hrs.)
Professional Skill 25 Hrs; Professional Knowledge 06 Hrs	Define risk evaluation and control procedures. Identify the direct/ indirect loss, mitigation measures, use of salvage sheets and salvage equipment. (Mapped NOS: MEP/N7303)	57. Physical Exercise & Squad drill. (10 hrs) **Salvage drill** 58. Method of using salvage sheet and special equipment. (05 hrs) 59. Using selvage method and procedure with different selvage equipment's and tools. (10 hrs)	Rural Fires: Fire Hazards in grasslands, Forest areas, rural areas and hay stacks. Causes of fire Special appliances and equipment used. Methods of fire fighting in rural area. (07 hrs.)
Professional Skill 25 Hrs; Professional Knowledge 06 Hrs	Measure various capacities of water bodies & hydraulics in relation to water head, friction loss, velocity and water discharge. (NOS: MEP/N9416)	60. Physical Exercise & Squad drill. (10 hrs) **Stretcher drill – Using Neil Robertson Stretcher** 61. Method of carrying stretcher with casualty. (05 hrs) **Standard test** 62. Method of hydraulic test for fire extinguisher and SCBA set. (05hrs) 63. Method of standard test of ladder and small gears. (05hrs)	Hydraulics: introduction & Units of measuring Length, Area and Volume of regular and irregular shaped Pressure & their conversion, Principal Characteristics of pressure and pressure head. Calculation of capacity of tanks of different shapes and sizes. (06 hrs.)
Project work/Industrial Training			

SYLLABUS FOR CORE SKILLS
1. Employability Skills (Common for all CTS trades) (60 Hrs)

Learning outcomes, assessment criteria, syllabus and Tool List of Core Skills subjects which is common for a group of trades, provided separately in www.bharatskills.gov.in/ dgt.gov.in

List of Tools & Equipment			
FIREMAN (for Batch of 24 Candidates)			
S No.	**Name of the Tools and Equipment**	**Specification**	**Quantity**
A. SHOP TOOLS & INSTRUMENTS			
Lists of Tools:			
1.	Water $C0_2$ Type Fire Extinguisher	9 Ltrs. Cap.	01 Nos.
2.	Stored pressure Type Fire Extinguisher	9 Ltrs. Cap.	08 Nos.
3.	Mechanical Foam type Fire Extinguisher	9 Ltrs. Cap.	08 Nos.
4.	$C0_2$Type Fire Extinguisher	4.5 kg	08 Nos.
5.	BC Type Fire Extinguisher	5/10 Kg	02 Nos.
6.	ABC Type Fire Extinguisher	5/10 Kg	08 Nos.
7.	*Extension Ladder*	*Size-45/35 ft*	*02 Nos.*
8.	*All types of Branches or Nozzles*		*04 Nos.*
9.	*Fire Hose*		
	a) 15m	*63 mm*	*12 Nos.*
	b) 30m	*63 mm*	*05 Nos.*
10.	*First Aid Box*		*01 No.*
11.	*All Types of small gears like - fireman Axe, Crow bar, Cutter, Torch, Ceilling Hook, Fire beater etc.*		*One each*
12.	*BA Set (Negative & Positive Pressure)*		*02 Nos.*
13.	*a) Gas Cylinders*	*300 bars,200 bars*	*02 Nos.*
	b) Steel Back Plates	*300 bars*	*02 Nos.*
	c) Face Masks		*02 Nos.*
14.	*Portable Fire Pump/TFP*	*1800 LPM*	*02 Nos.*
15.	*All types of couplings*	*63 mm & 38 mm*	*01 Set*
16.	*Hydrant-Stand Pipe Type* with Hydrant Flange	*63 mm*	*02 Nos.*
17.	Fire Trays	3x2 mtrs.	02 Nos.
18.	*Manual call point*		*01 No.*
19.	Entry Suit/ Proximity Suit	3 Layers Nomex Proximity suit	02 Nos.
20.	*Hose reel system*	*30 mtrs.*	*01 No.*
21.	*Nitrogen Cylinder*	*11 kg.*	*01 No.*
22.	*Hose Box*	*Single/ Double door*	*01 No.*

23.	*Fire Fighting Point complete Set*	*1 set*	*01 No.*
24.	*Suction Hose 10 ft*	*100 mm*	*02 Nos.*
25.	*Suction Wrench*	*Universal*	*02 Nos.*
26.	Metal Strainer		02 Nos.
27.	Basket Strainer		01 No.
28.	*Ropes 100 ft Long*	*2"*	*01 No.*
29.	*Lines 100 ft Long*	*2"*	*01 No.*
30.	Control Panel – Model-Pump	1800 lpm Portable	01 No.
31.	Personal Protective Equipment		
	a) Helmet (Type A,B,C)		24 Nos.
	b) Laser Welding Safety Goggles		12 Nos.
	c) Face Shield		12 Nos.
	d) Welding Shield		12 Nos.
	e) Ear Muff		12 Nos.
	f) Ear Plug		12 Nos.
	g) Canal Caps		12 Nos.
	h) Safety Shoes		24 Nos.
	i) Asbestos Gloves		12 Nos.
	j) Electrical Hand Gloves		12 Nos.
	k) Hand Gloves (Rubber)		12 Nos.
	l) Dust Mask		12 Nos.
32.	Personal Protective Clothing for men		
	a) Safety Shirt	F R base	12 Nos.
	b) Safety Trouser	F R base	12 Nos.
	c)Safety Jacket	Luminous	12 Nos.
	d) Cooling Vest		03 Nos.
	e) Gum Boots		12 Nos.
List of Equipment			
33.	Personal Fall Arrest System (PFAS)	3 mtrs.	02 Nos.
34.	Tripod	With hinge and sling	02 Nos.
35.	Pulley	4"	02 Nos.
36.	Suspended Scaffold		02 Nos.
37.	Gas Detector	Manual	02 Nos.
38.	Plastic Tunnel (Sewer Rescue Drill)		04 Nos.
39.	Body Harness	Full body	01 No.
40.	Collecting Breeching	63 mm	02 Nos.
41.	Dividing Breeching (Hand control)	63 mm	02 Nos.
42.	Hydrant Flange	63 mm	02 Nos.
43.	Hydrant Key & Bar (With hydrant Spindle)		01 No.
44.	Adopter for Air Store Pressure		02 Nos.
45.	Hydraulic Pressure Testing Machine		01 No.

46.	Sprinklers Head	Bulb Type, Fusible Type	02 Nos.
47.	Safety Belt		04 No.
48.	Desktop computer	CPU: 32/64 Bit i3/i5/i7 or latest processor, Speed: 3 GHz or Higher. RAM:-4 GB DDR-III or Higher, Wi-Fi Enabled. Network Card: Integrated Gigabit Ethernet, with USB Mouse, USB Keyboard and Monitor (Min. 17 Inch. Licensed Operating System and Antivirus compatible with trade related software.	08 Nos.
49.	Computer Table		08 Nos.
50.	Computers Chairs		08 Nos.
51.	White Board		01 No.
52.	L.C.D. Projectors		02 Nos.
53.	UPS		As Required
54.	All types of Detectors 1 Pcs. of each		04 Nos.
55.	Flux meter		06 Nos.
56.	Dosi meter		01 No.
57.	Cut model of Fire Extinguisher / Fire pump		02 Nos.
58.	Fire Suit		02 Nos.
59.	Fire Tender (one For the Institute)		01 No.
60.	Rescue Van (one For the Institute)		01 No.
61.	Foam Making equipment i. Foam making Branches ii. Inline Inductor iii. MFG-5 -> FMB-5x iv. MFG-10 -> FMB-10x v. Medium/High EX. Generator	FB-2, FB -10	01 Each
62.	Salvage equipment-salvage Sheet, Hoppers, Dolliese, Buckets, Bolt Cutter, Hammer, gloves, ropes, ceiling hook ,Lamp tec.		01 Each
63.	Fire Extinguisher Ball		04 Nos
64.	Fire Extinguishing Fire Robot		01 Nos
65.	Fire Extinguisher Dron		01 Nos
66.	Automatic modular Fire Extinguisher		01 Nos
67.	Safety Horness		03 Nos

B. SHOP FLOOR FURNITURE AND MATERIALS - For 2 (1+1) units no additional items are required.			
68.	Instructor's table		01 No.
69.	Instructor's chair		02 Nos.
70.	Metal Rack	100cm x 150cm x 45cm	04 Nos.
71.	Lockers with 16 drawers standard size		02 Nos.
72.	Steel Almirah	2.5 m x 1.20 m x 0.5 m	02 Nos.
73.	Black board/white board		01 No.
74.	Fire Extinguisher		02 Nos.
75.	Fire Buckets		02 Nos.

Note:

1. *The items in bold and italics are meant to be used for any of the two courses viz. 'Fireman / Fire Technology & Industrial Safety Management'/ 'Health Safety & Environment'. If an institute is running any of the two trades, items in bold and italics are not required to be purchased separately.*
2. *Internet facility is desired to be provided in the class room.*

ABBREVIATIONS

CTS	Craftsmen Training Scheme
ATS	Apprenticeship Training Scheme
CITS	Craft Instructor Training Scheme
DGT	Directorate General of Training
MSDE	Ministry of Skill Development and Entrepreneurship
NTC	National Trade Certificate
NAC	National Apprenticeship Certificate
NCIC	National Craft Instructor Certificate
LD	Locomotor Disability
CP	Cerebral Palsy
MD	Multiple Disabilities
LV	Low Vision
HH	Hard of Hearing
ID	Intellectual Disabilities
LC	Leprosy Cured
SLD	Specific Learning Disabilities
DW	Dwarfism
MI	Mental Illness
AA	Acid Attack
PwD	Person with disabilities


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