PUNJAB BOARD OF TECHNICAL EDUCATION

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SAY NO TO CORRUPTION

No: PBTE/R&D/2026/21 Dated: 28-01-2026

NOTIFICATION

In pursuance of the NAVTTC Notification No. (D.G) (SS&C)/2021-QD-1 dated 26.11.2025, it is notified that the newly developed curricula of the following short courses have been approved by National Vocational & Technical Training Commission (NAVTTC) for their implementation with immediate effect in all institutes affiliated with PBTE.

- Advance Health Safety, Environment & Fire Safety Officer (6-months Course)
- Heat Exchanger Maintenance Technician (6-Months Course)
- Quality Assurance & Quality Control Technician (3-Months Course)
- Fabrication Supervisor (3-Months Course)
- Pressure Vessel Maintenance Technician (3-Months Course)

Soft copy of the curricula of the said courses may be downloaded from the website of PBTE i.e. www.pbte.edu.pk/textbooks.html.

SECRETARY

CC to:

1- PS to Chairperson PBTE, Lahore.
2- PA to Secretary PBTE, Lahore.
3- PA to Controller of Examinations PBTE, Lahore.
4- PA to DG Academics TEVTA, Lahore.
5- PA to DG Operations TEVTA, Lahore.
6- The Principals concerned.
7- Deputy Controller of Examinations (Conduct) PBTE, Lahore
8- Deputy Controller of Examinations (Secrecy) PBTE, Lahore.
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13-Assistant Controller of Examinations (P&P-I) PBTE, Lahore.
14-Assistant Controller of Examinations (P&P-II) PBTE, Lahore.
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19-Notification File.

GOVERNMENT OF THE PUNJAB

TECHNICAL EDUCATION & VOCATIONAL TRAINING AUTHORITY

CURRICULUM FOR

Advance Health, Safety, Environment and Fire Safety Officer (06 –Months)

CURRICULUM SECTION
ACADEMICS DEPARTMENT
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EXECUTIVE SUMMARY

The Advance Health, Safety, Environment (HSE) and Fire Safety Officer (06 Months / 800 Hours) training program has been designed to produce competent safety professionals who can contribute to safe, healthy, and sustainable workplaces across Pakistan as well as abroad. Developed in line with P-TEVTA and NAVTTC standards and benchmarked against international best practices (ISO 45001, OSHA, ILO, NFPA), this course blends theory, practical training, industrial visits, and some project work to ensure graduates are job-ready in this field.

The curriculum emphasizes hazard identification, risk assessment, fire safety, first aid, occupational health, worksite safety, safety audits, and compliance with national legislation. In addition, modern topics such as Behavior-Based Safety (BBS), Contractor Safety Management, and Digital HSE Tools have been incorporated to prepare trainees for evolving industry requirements.

Course main Salients: -

- Duration: 6 Months (20 Weeks Curriculum Delivery)
- Total Hours: 800 (240 Theory + 560 Practical)
- Main Contents / Modules: 07 including Foundations, Core Safety Practices, Worksite Safety, Compliance, Professional Development and Enrichment Modules.
- Assessment: Written Tests, Practical Demonstrations, Assignments, Projects, Viva.

Key Learning Outcomes

By the end of this program, trainees will be able to:

- Conduct hazard identification, risk assessments, and accident investigations.
- Implement fire safety, first aid, occupational health, and emergency response measures.
- Manage site safety through PTW systems, LOTO, scaffolding, lifting, chemical handling, and apply basic concepts of Green Energy for sustainable workplace practices.
- Apply legal and regulatory requirements, including the Factories Act 1934, POSH Acts 2019, Environmental Protection Act, and Building Code of Pakistan (Fire Provisions).
- Demonstrate leadership, ethics, safety culture building, and effective communication.
- Use digital tools for incident tracking, safety audits, and reporting.

TRAINING OBJECTIVES

The objective of this training course is to produce skilled Health, Safety, Environment and Fire Officers capable of ensuring safe and healthy working environments across diverse industries such as construction, manufacturing, oil & gas, healthcare, and services. This program is designed to equip trainees with both theoretical knowledge and practical skills aligned with international HSE standards (ISO 45001, OSHA, NFPA, ILO conventions).

The course covers fundamental and advanced occupational health & safety concepts, including hazard identification, risk assessment, fire safety, occupational health, process safety, emergency preparedness, and safety legislation. It emphasizes a strong balance between technical expertise and practical application, ensuring that graduates are prepared to implement and monitor safety management systems effectively.

Keeping in view workplace realities, the training also integrates modules on work ethics, communication, leadership, audits, sustainability, and entrepreneurship to prepare trainees for supervisory and professional roles. Practical drills such as firefighting, first aid, accident investigation, site inspections, and mock emergency response ensure that participants not only understand safety procedures but can confidently apply them in real-world scenarios.

This course has been developed to meet both local industry requirements and international market demands, enabling graduates to work in Pakistan as well as Gulf countries (UAE, Saudi Arabia, Qatar, Oman, etc.).

CURRICULUM SALIENT'S

Parameter	Details
Entry Level	**06- Months Course (Basic + Advance)**: Matriculation preferably with science background **03- Months Course (Advance Level)**: Direct Entry in Last 3 Months of this course for DAE graduates
Name of Course	Advance Health, Safety, Environment & Fire Safety Officer
Duration of Course	06 Months (20 Weeks delivery)
Total Training Hours	800 Hours
Training Hours per Day	7 Hours per Day, 5 Hours on Friday
Training Methodology	• Practical: 70% • Theory: 30% • Site Visits / Industrial Attachments included in 6th month
Medium of Instruction	Urdu / English
Mode of Assessment	• Written Tests • Practical Demonstrations • Assignments & Projects • Final Viva / Presentation Also following QAB Rules
Certification	Certificate in Advance Health, Safety, Environment & Fire Safety Officer (National Level, but contents aligned with International HSE Standards)
Target Industry Sectors	• Oil & Gas • Construction & Infrastructure • Manufacturing (Cement, Textile, Steel, Fertilizer, Sugar, etc.) • Healthcare & Hospitals • Power & Utilities • Logistics & Warehousing

SKILL COMPETENCY DETAILS

Upon successful completion of the course, the trainee should be able to: -

Sr. No.	Skill Competency
1	Identify workplace hazards (physical, chemical, biological, ergonomic, psychological) and recommend appropriate control measures.
2	Carry out detailed risk assessments (HIRA, JSA, TRA, HAZOP) and implement the control hierarchy.
3	Apply and enforce the use of personal protective equipment (PPE) and train workers on proper usage.
4	Conduct site inspections and safety audits to identify non-conformities and recommend corrective actions.
5	Lead accident and incident investigations using RCA, FTA, and Bow-Tie analysis, and prepare formal reports.
6	Demonstrate competence in fire safety, including fire prevention, fire extinguisher handling, and firefighting drills.
7	Provide first aid and basic life support (CPR, bleeding control, burns, trauma management) at the workplace.
8	Implement construction safety practices for excavation, scaffolding, confined spaces, hot work, cranes, and lifting operations.
9	Apply process safety principles for handling chemicals, petroleum products, pressurized systems, and hazardous materials.
10	Ensure electrical and mechanical safety (LOTO procedures, tools inspection, machine guarding, vehicle/machinery safety).
11	Develop, implement, and monitor Emergency Response Plans (ERP) including evacuation drills, disaster management, and crisis communication.
12	Apply international standards (ISO 45001, OSHA, ILO conventions, NFPA codes) in safety management systems.
13	Prepare safety documentation, reports, KPIs, and compliance records as per organizational and legal requirements.
14	Conduct safety training sessions and toolbox talks for workers and supervisors.
15	Demonstrate professional workplace ethics, leadership, and communication skills to influence positive safety culture.

KNOWLEDGE PROFICIENCY DETAILS

Upon successful completion of the course, the trainee should be able to

Sr. No.	Knowledge Proficiency
1	Know the principles of Occupational Health & Safety (OHS), including accident causation theories and prevention strategies.
2	Explain different types of hazards (physical, chemical, biological, ergonomic, psychological) and their impacts on health, safety, and productivity.
3	Describe the risk management process (hazard identification, risk evaluation, control measures) and its application across industries.
4	Elaborate knowledge of international safety standards (ISO 45001, OSHA 29 CFR, ILO C155, NFPA codes) and their relevance to workplace safety.
5	Explain the use, selection, limitations, and maintenance of Personal Protective Equipment (PPE) and respiratory protective devices.
6	Interpret fire science and firefighting systems, including detection, suppression, and emergency evacuation procedures.
7	Explain the knowledge of construction and industrial safety practices including scaffolding, excavation, welding, lifting, confined spaces, and hot work.
8	Illuminate the basics of chemical safety, process safety, and hazardous substances handling, including MSDS/GHS standards.
9	Elucidate electrical and mechanical safety requirements (LOTO, guarding, inspections, permit-to-work systems).
10	Describe the principles of emergency preparedness and disaster management, including response structures and drills.
11	Explain the steps and methods of incident investigation and reporting (Root Cause Analysis, FTA, Bow-Tie).
12	Understand the principles of safety auditing, inspection techniques, and safety performance measurement (KPIs, lagging & leading indicators).
13	Describe the fundamentals of occupational health and industrial hygiene, including noise, ergonomics, stress, heat, cold, and radiation hazards.
14	Elaborate understanding of environmental sustainability within HSE, including waste management, spill response, ESG integration, and Green Energy concepts (solar, wind, hydro, biomass, geothermal) with focus on carbon emission reduction.
15	Understand workplace ethics, communication strategies, leadership, and behavior-based safety for building positive safety culture.

SCHEME OF STUDIES

This (800 Hours / 6 Months) course is divided into 7 structured Main Topics/ modules. Each module progressively develops theoretical knowledge and practical competency through lectures, workshops, field exercises, simulations, industrial visits, and some project work.

Module/ Main Topics Overview (Divide in 2 separate portions)

Basic Safety concepts (Month 1– 3)

Advance Safety topics (Month 4 – 6)

Basic part of course (10 Weeks) (400 Hours)			
Sr. No.	**Title of Module/ Main Topic**	**Duration (Weeks)**	**Total Hours**
1	Foundations of OHS	Weeks 1–4	133
2	Core Safety Practices	Weeks 4–8	167
3	Safety Management & Compliance (I)	Weeks 8–10	100
Advance part of course (10 Weeks) (400 Hours)			
4	Safety Management & Compliance (II)	Weeks 11-13	100
5	Worksite & Construction Safety	Weeks 13–16	132
6	Professional Development	Weeks 16-18	82
7	Enrichment / Advanced Modules	Weeks 18-20	86

Weekly Distribution Overview:

Sr. No.	Module / Topics	Main Coverage	Theory	Practical	Total	Mode of Training	Assessment Method
Foundations of OHS							
1	Module 1 – Introduction to OHS	Role of Safety Officer, definitions, accident causation theories	10	23	**33**	Classroom lectures, workshops	Written Test
2	Module 1 – OHS Foundations	Cost of accidents, OHS statistics, orientation, safety culture	10	23	**33**	Lectures, case studies	Written Test
3	Module 1 – Hazard Identification	Hazard types, spotting, risk matrix, control hierarchy	10	23	**33**	Workshops, group exercises	Practical Demo
4	Module 1 – Accident Investigation	RCA tools, FTA, Bow-Tie, reporting	10	24	**34**	Case studies, simulations	Practical Report
Total : Module 1			**40**	**93**	**133**		
Core Safety Practices							
5	Module 2 – PPE	Types, standards, SCBA drills	7	16	**23**	Practical drills, lab	Practical Demo
6	Module 2 – Fire Safety I	Fire triangle, classes, ignition sources	7	16	**23**	Simulations, safety drills	Practical Demo
7	Module 2 – PTW intro	Permit system, LOTO	10	23	**33**	Site simulations	Practical Test
8	Module 2 – First Aid I	DR-ABC, CPR, bleeding, burns	10	23	**33**	Hands-on drills, manikins	Practical Test

Sr. No.	Module / Topics	Main Coverage	Theory	Practical	Total	Mode of Training	Assessment Method
9	Module 2 – First Aid II	Fractures, shock, casualty transport	7	17	**24**	Practical sessions, demos	Practical Test
10	Module 2 – Occupational Health	Noise, vibration, ergonomics, heat/cold stress	8	23	**31**	Lab exercises, demo	Assignment
Total : Module 2			**49**	**118**	**167**		
Safety Management & Compliance (I)							
11	Module 3 – Housekeeping & Material Handling	5S, site layout, welfare, manual handling	10	23	**33**	Workshops, field demo	Practical Test
12	Module 3 – Emergency Preparedness	ERP, evacuation drills	10	23	**33**	Drills, workshops	Mock Drill Eval.
13	Module 3 – Disaster Management	Crisis communication, table-top drills	10	24	**34**	Role play, group work	Table-top Eval.
Total : Module 3			**30**	**70**	**100**		
Safety Management & Compliance (II)							
14	Module 4 – Safety Audits & ISO 45001	Audit planning, checklists, mock audit	10	23	**33**	Group projects	Audit Report
15	Module 4 – Safety Legislation	Factories Act, OSHA, ILO, NFPA, PEPA 1997, Fire Code 2016	10	23	**33**	Classroom lectures	Written Test
16	Module 4 – Environmental Safety, Green Energy & ESG	Waste management, spill response, sustainability, Introduction to Green Energy, Storage, labeling	10	24	**34**	Group projects, demos	Assignment
Total : Module 4			**30**	**70**	**100**		
Worksite & Construction Safety							
17	Module 5 – Fire Safety II	Fire alarms, extinguishers, evacuation drills	8	18	**26**	Fire drills, exercises	Fire Drill Eval.
18	Module 5 – Construction Safety I	Excavation, trenching, scaffolds	8	18	**26**	Field demo, group exercise	Practical Demo
19	Module 5 – Construction Safety II	Fall protection, cranes, rigging	8	18	**26**	Site-based drills	Practical Test
20	Module 5 – Mechanical & Electrical Safety	Machine guarding, forklifts, electrical hazards	8	18	**26**	Practical demo, labs	Practical Test
21	Module 5 – Chemical & Process Safety	MSDS, GHS, petroleum, spill response	8	20	**28**	Lab demos, simulations	Written & Practical
22	Module 5 – Assessment Week	Mid-term review + Written & Practical Exams	–	–	–	Exam	Exam
Total : Module 5			**40**	**92**	**132**		
Professional Development							
23	Module 6 – Training & Communication	Induction, toolbox talks, BBS intro	7	17	**24**	Role plays, presentations	Practical Demo

Sr. No.	Module / Topics	Main Coverage	Theory	Practical	Total	Mode of Training	Assessment Method
24	Module 6 – Leadership & CSR	Ethics, teamwork, CSR initiatives	7	17	**24**	Workshops, presentations	Group Project
25	Module 6 – Industrial Visits	Construction, factory, oil/gas, hospital visits	10	24	**34**	Industrial visits	Visit Report
Total : Module 6			24	**58**	**82**		
Enrichment / Advanced Modules							
26	Module 7 – Enrichment + Final Project	BBS, Contractor Safety, Digital HSE Tools, International Exam Preparation (IOSH, OSHA, NEBOSH) Final Project & Viva	26	60	**86**	Case studies, Lectures, projects	Project + Viva, Mock tests, Group Activities
Total : Module 7			**26**	**60**	**86**		
Grand Total			**240**	**560**	**800**		

DETAIL OF COURSE CONTENTS

S#	Main Topic	Detailed Sub-Topics	Theory	Practical	Total
Module 1 – Foundations of OHS (133 hrs.) (Basic)					
1	Introduction to OHS & Role of Safety Officer	• Importance of OHS in industry • Roles & responsibilities of Safety Officer • Definitions (hazard, risk, incident, accident, near miss) • Accident causation theories (Domino, Swiss Cheese, Human Factor, Bird's Model) • Cost of accidents (direct, indirect) • International & local OHS statistics (ILO, OSHA, GCC, Pakistan) • Safety culture basics & BBS introduction	10	23	**33**
2	OHS Foundations	• Accident statistics interpretation • Proactive reporting systems • Elements of a strong safety culture • Orientation for employees & contractors • Safety leadership fundamentals	10	23	**33**
3	Hazard Identification & Risk Assessment	• Hazard types (physical, chemical, biological, ergonomic, psychosocial) • Hazard spotting techniques (checklists, tours, observations, near miss reporting) • Risk matrix (Likelihood × Severity) • Control hierarchy (Elimination → PPE) • Job Safety Analysis (JSA) workshop • HAZOP introduction • Case studies (construction, oil & gas, manufacturing)	10	23	**33**
4	Accident Investigation & Reporting	• Accident/incident/near miss classifications • Legal & organizational requirements • Evidence collection (photos, witness	10	24	**34**

S#	Main Topic	Detailed Sub-Topics	Theory	Practical	Total
		statements, samples) • RCA tools (5 Whys, Fishbone, Barrier Analysis) • Fault Tree Analysis (FTA) • Bow-Tie method • Report writing methodology • CAPA implementation • Case study simulations			
Module 2 – Core Safety Practices (167 hrs.)					
5	PPE & Breathing Apparatus	• Categories of PPE (head, eyes, face, hearing, respiratory, hand, foot, body, fall protection) • Respiratory protection (APR, SCBA, airline systems) • PPE standards (ANSI, EN, ISO) • PPE selection criteria • Limitations of PPE • Inspection & maintenance of PPE • BA set donning & doffing drills • Case study: PPE failures	7	16	**23**
6	Fire Science & Fire Safety I	• Fire chemistry and spread • Fire classes (A, B, C, D, K) with examples • Common ignition sources • Passive vs active fire prevention methods • Fire detection and alarm systems basics	7	16	**23**
7	Work Permit System & Site Safety	• PTW importance & objectives • Types of permits (Hot Work, Confined Space, Excavation, Electrical, Radiography) • Roles of issuer & receiver • Permit forms & documentation • Isolation & LOTO procedures • Site access control, signage & barricading • Permit issue & closure practice	10	23	**33**
8	First Aid-I (CPR, Bleeding, Burns)	• DR-ABC primary survey • CPR (adult/child) with manikins • Wound & bleeding control • Burn management (thermal, chemical, electrical) • Fracture immobilization & splints • Shock recognition & treatment • Poisoning & choking response • Heat stress & hypothermia management • Stretcher & casualty transport	10	23	**33**
9	First Aid II (Fractures, Shock, Transport)	• Fracture care • Immobilization • Casualty transport	7	17	**24**
10	Occupational Health & Industrial Hygiene	• Occupational diseases (silicosis, asbestosis, hearing loss, dermatitis)	8	23	**31**

S#	Main Topic	Detailed Sub-Topics	Theory	Practical	Total
		• Noise hazards & hearing protection • Vibration risks & controls • Lighting requirements & lux measurement • Ionizing & non-ionizing radiation hazards • Ergonomics & workstation design • Chemical exposure monitoring • Biological hazards (HIV, TB, COVID-19) • Stress & mental health management			
Module 3 – Safety Management & Compliance (100 hrs.)					
11	Housekeeping & Material Handling	• 5S principles (Sort, set in order, Shine, Standardize, Sustain) • Waste disposal methods (general, hazardous, recyclable) • Safe layout & traffic management on worksites • Material stacking & racking safety (height limits, stability, spacing) • Aisle clearance & access requirements • Use of mechanical handling equipment (trolleys, hoists) • Manual handling techniques & ergonomics • Storage of flammable/chemical materials • Case studies of poor housekeeping accidents	10	23	**33**
12	Emergency Preparedness	• Elements of an Emergency Response Plan (ERP) • Roles & responsibilities of ERT members (fire wardens, first aiders, evacuation leaders) • Evacuation planning (routes, assembly points, signage) • Communication protocols during emergencies • Mock drills (fire, earthquake, chemical spill) • Table-top vs full-scale drills • Integration with local authorities (fire brigade, hospitals) • Post-drill evaluation and improvement planning	10	23	**33**
13	Disaster Management	• Classification of disasters (natural, technological, man-made) • Risk assessment for disaster-prone activities • Crisis communication strategies • Media handling during disasters	10	24	**34**

S#	Main Topic	Detailed Sub-Topics	Theory	Practical	Total
		• Business continuity elements (backup power, relocation plans) • Incident Command System (ICS) overview • Coordination with government disaster agencies • **Case studies of major disasters** • Mangaf Building Fire Case 2024(Kuwait) • Rana Plaza (Major Fire and structure collapse) 2013 (Bangladesh) • Chernobyl Nuclear Power Plant 1986 (Ukrainian)			
Module 4 – Safety Management & Compliance (100 hrs) (Advance)					
14	Safety Audits & ISO 45001	• ISO 45001 framework & clauses (context, leadership, support, operations, evaluation, improvement) • Key safety KPIs (TRIR, LTIFR, Near Miss Frequency Rate) • Types of audits (internal, external, compliance, behavioral) • Audit planning (scope, objectives, criteria) • Safety inspection methods (checklists, walkdowns, interviews) • Mock audit simulation exercise • Reporting non-conformities (NCs, OFIs) • CAPA process follow-up & closure	10	23	**33**
15	Safety Legislation & Standards	• Pakistan Factories Act, OSH requirements • OSHA 29 CFR overview (general industry & construction parts) • ILO conventions (C155, C161, C187) • NFPA fire codes (NFPA 10 – extinguishers, NFPA 30 – flammables, NFPA 72 – alarms) • HCIS standards (Saudi Arabia) • Roles of employer & employee under law • Legal compliance inspections & enforcement • Penalties and liabilities for non-compliance	10	23	**33**
16	Environmental Safety, Green Energy & ESG	• Environmental aspects & impacts identification • Waste management hierarchy (reduce, reuse, recycle, dispose) • Hazardous waste handling & disposal • Spill prevention & containment techniques	10	24	**34**

S#	Main Topic	Detailed Sub-Topics	Theory	Practical	Total
		• Pollution prevention methods (air, water, soil) • Introduction to Green Energy (Meaning, importance, and link with sustainability goals,) • Sustainability in the workplace (energy conservation, green buildings) • ESG (Environmental, Social, Governance) compliance & reporting • Global ESG frameworks (GRI, SASB, UN SDGs introduction) • Case study: Successful ESG and Green Energy integration in industry, highlighting renewable initiatives such as Quaid-e-Azam Solar Park (Pakistan) and Masdar City (UAE).			
Module 5 – Worksite & Construction Safety (132 hrs)					
17	Fire Safety II (Alarms, Extinguishers, Evacuation)	• Fire extinguishers: types, suitability, limitations • Sprinkler & hydrant systems overview • Evacuation planning & drills • Role of fire wardens	8	18	**26**
18	Construction Safety I	• Excavation & trenching hazards (collapse, engulfment, water ingress) • Protective systems (benching, sloping, shoring, shielding) • Safe access/egress (ladders, ramps, stairs) • Scaffold erection standards (frame, tube & coupler, system scaffolds) • Scaffold inspection checklist & tagging system (green/yellow/red tags) • Working platform safety (toe boards, guardrails, decking) • Ladder selection criteria (step ladders, extension ladders) • Safe ladder use (4:1 ratio, three-point contact) • Portable vs fixed ladders – inspection & maintenance	8	18	**26**
19	Construction Safety II	• Fall protection hierarchy (elimination, guardrails, nets, PPE) • Full body harness inspection, donning/doffing drills • Anchor points & lifeline systems (horizontal/vertical) • Crane types (tower, mobile, crawler, overhead) & their hazards • Lifting plan preparation & pre-lift meeting requirements	8	18	**26**

S#	Main Topic	Detailed Sub-Topics	Theory	Practical	Total
		• Rigging hardware (slings, shackles, hooks, eyebolts, spreader beams) • Safe rigging practices (load charts, sling angles, hitch types) • Communication during lifting operations (hand signals, radios) • Common crane/rigging accidents and case studies			
20	Mechanical & Electrical Safety	• Machine guarding systems (fixed, interlocked, adjustable, self-adjusting) • Types of mechanical hazards (entanglement, crushing, shearing, drawing-in) • Forklift operations (load stability, safe driving, reversing, parking) • Forklift inspection & daily checklist • Mobile elevated work platforms (MEWPs) safe practices • Hand & power tools (grinders, drills, saws) – selection, use, and inspection • Lockout/Tagout (LOTO) devices & procedures • Arc flash hazards (boundaries, PPE, labels) • Temporary electrical installations on sites (cables, panels, RCDs) • Electrical emergency response (shock rescue, CPR)	8	18	**26**
21	Chemical & Process Safety	• GHS hazard classification & labeling system • Safety Data Sheets (SDS) sections and practical use • Chemical storage requirements (compatibility, segregation, ventilation) • Flammable liquids/gases safe handling & transfer procedures • Compressed gas cylinder safety (storage, handling, color coding) • Petroleum & LPG handling precautions • Process vessels & pressure relief systems • Chemical spill response drills (neutralization, absorbents, disposal) • Corrosive substance handling (acids, alkalis, PPE requirements) • Case studies: Bhopal disaster, Flixborough explosion	8	20	**28**
22	Mid-Term Exams	• Written exam covering Modules 1–3 (MCQs, short notes, case study analysis)	–	–	–

S#	Main Topic	Detailed Sub-Topics	Theory	Practical	Total
		• Practical exam (fire drill, PPE use, first aid, scaffold inspection, rigging demo, risk assessment exercise) • Group presentation on accident investigation or hazard identification			
Module 6 – Professional Development (82 hrs)					
23	Safety Training & Communication	• Designing induction training for workers & contractors • Conducting toolbox talks (planning, delivery, follow-up) • Safety awareness campaigns (themes, posters, competitions) • Introduction to Behavior-Based Safety (BBS – observation & feedback) • Training needs analysis (TNA) & competency mapping • Communication skills for safety professionals (presentations, briefings) • Use of visual aids & digital tools in safety training • Role-play and interactive training methods	7	17	**24**
24	Workplace Ethics & Leadership	• Leadership styles (autocratic, democratic, transformational, situational) • Ethical responsibilities of HSE professionals • Building and sustaining a positive safety culture • Team building & conflict resolution techniques • Motivating workers for safe behavior • Case studies on ethical issues in safety • Role of leadership in crisis situations	7	17	**24**
25	Industrial Visits	• Visit to a construction site (scaffold safety, excavation control, lifting procedure) • Visit to an oil & gas facility (process safety, confined space entry) • Visit to a factory (steel, textile, cement, fertilizer industries) • Visit to a hospital (healthcare safety, infection control, waste management) • Observation & data collection during site visits • Report writing & presentation skills • Linking industrial observations to classroom learning	10	24	**34**
Module 7 – Enrichment & Advanced Modules (86 hrs)					

S#	Main Topic	Detailed Sub-Topics	Theory	Practical	Total
26	Enrichment + Final Project (BBS Advanced, CSM, Digital HSE Tools, International Exam Preparation guidelines (IOSH, OSHA, NEBOSH), Final Viva	• Advanced Behavior-Based Safety (BBS): principles, advanced observation techniques, feedback & reinforcement, linking BBS to safety KPIs • Contractor Safety Management (CSM): prequalification, induction & onboarding, PTW integration, performance monitoring, contractor safety audits, case studies of contractor-related incidents • Digital HSE Tools: safety dashboards in Excel/Power BI, mobile inspection apps, digital PTW systems, IoT-enabled safety monitoring, cloud-based safety data management. • Review of official past papers (NEBOSH IGC, IOSH MS, OSHA 30hr). • Capstone Project: conduct a high-level risk assessment or safety improvement plan on a live site, prepare a safety audit report, and present solutions • Final Viva & Presentation: oral examination before an expert panel, defense of capstone project, industrial visit reports, and evaluation of overall competence	26	60	86

LIST OF PRACTICAL

Sr. No.	Detail of Exercises
1	Introduction & HSE 1.1 Demonstrate workplace safety orientation 1.2 Identify and classify workplace hazards 1.3 Conduct hazard spotting exercise
2	Risk Assessment (HIRA, JSA, TRA) 2.1 Perform hazard identification on site 2.2 Complete a Job Safety Analysis form 2.3 Develop a risk matrix (Likelihood × Severity) 2.4 Apply control hierarchy on identified risks
3	Accident Investigation 3.1 Conduct accident/near-miss role play 3.2 Apply Root Cause Analysis (RCA) 3.3 Prepare an investigation report 3.4 Present corrective & preventive actions
4	Personal Protective Equipment (PPE) 4.1 Inspect helmets, gloves, goggles, and safety shoes 4.2 Demonstrate donning & doffing of harness 4.3 Use of SCBA and cartridge respirator 4.4 PPE maintenance and storage
5	Fire Safety & Firefighting 5.1 Identify fire classes and extinguishers 5.2 Demonstrate extinguisher use (CO_2, DCP, Foam, Water) 5.3 Fire hose operation 5.4 Conduct live firefighting drill & evacuation
6	First Aid & CPR 6.1 Demonstrate CPR on manikins (adult/child) 6.2 Manage bleeding, burns, fractures, and shock 6.3 Perform casualty transport and stretcher handling 6.4 Demonstrate AED use (if available)
7	Occupational Health & Hygiene 7.1 Noise monitoring with dosimeter/sound meter 7.2 Light level measurement (lux meter) 7.3 Gas detection (O_2, CO, H_2S) 7.4 Ergonomic workstation assessment
8	Permit-to-Work (PTW) & LOTO 8.1 Prepare and issue Hot Work Permit 8.2 Confined space entry permit practical 8.3 Apply Lockout/Tagout on electrical panel 8.4 Excavation permit and site marking
9	Construction Safety 9.1 Scaffold inspection and tagging 9.2 Ladder inspection and safe use 9.3 Working at height with harness & lifeline 9.4 Crane & rigging inspection 9.5 Lifting gear checks (slings, shackles)

Sr. No.	Detail of Exercises
10	Mechanical & Electrical Safety 10.1 Machine guarding inspection 10.2 Forklift safety inspection & driving demo 10.3 Hand tool & power tool inspection 10.4 Electrical panel safety check
11	Chemical & Process Safety 11.1 Read and interpret MSDS 11.2 GHS labeling identification 11.3 Demonstrate safe storage of chemicals 11.4 Spill response exercise with spill kit
12	Housekeeping & Material Handling 12.1 Conduct a housekeeping audit 12.2 Perform manual handling with proper ergonomics 12.3 Demonstrate safe stacking and storage 12.4 Prepare a site housekeeping checklist
13	Emergency Preparedness & Disaster Management 13.1 Conduct evacuation drill with muster point assembly 13.2 Perform chemical spill response drill 13.3 Mock drill for earthquake/fire scenario 13.4 Role-play of emergency team functions
14	Safety Audits & Inspections 14.1 Conduct workplace inspection with checklist 14.2 Prepare an audit report 14.3 Identify non-conformities 14.4 Suggest corrective & preventive actions
15	Environmental, Green Energy & ESG Safety 15.1 Waste segregation practical (solid, liquid, hazardous) 15.2 Demonstrate spill containment and disposal 15.3 Environmental impact identification exercise 15.4 Energy Audit & Conservation Exercise.
16	Safety Training & Communication 16.1 Deliver toolbox talk to workers 16.2 Conduct induction training role-play 16.3 Develop a safety poster/awareness campaign
17	Workplace Ethics, Leadership & CSR 17.1 Role-play on safety leadership 17.2 Conflict resolution in safety scenarios 17.3 Conduct a mock community awareness session (road/fire safety)
18	Industrial Visits & Projects 18.1 Visit to construction site (safety observation) 18.2 Visit to factory/refinery (audit exercise) 18.3 Visit to hospital (safety walkaround) 18.4 Prepare and present industrial visit report
19	Final Project & Viva 19.1 Group project on risk assessment 19.2 Accident investigation case study 19.3 Conduct mock international exam sessions (NEBOSH, IOSH, OSHA) including written papers, multiple-choice tests, and answer-writing practices.

Sr. No.	Detail of Exercises
	19.4 Final safety audit simulation 19.5 Viva before examination panel

TENTATIVELY PROPOSED ASSESSMENT & GRADING CRITERIA

To ensure balanced evaluation, student performance will be assessed through a combination of theory knowledge, practical skills, and project-based learning.

Assessment Component	Weightage (%)	Details
Theory / Written Tests	30%	Multiple-choice questions, short notes, case study analysis covering modules taught.
Practical Demonstrations & Lab Work	50%	Firefighting drills, first aid, PPE use, PTW, scaffold inspections, risk assessments, audits, and field exercises.
Assignments & Projects	10%	Risk assessment report, accident investigation report, safety audit presentation, safety awareness campaign design.
Final Viva & Presentation	5%	Oral examination before a panel on course modules, project defense, industrial visit reports.
Attendance & Class Participation	5%	Punctuality, discipline, participation in drills, toolbox talks, and discussions.

Minimum Pass Criteria

As per prevailing criteria of PBTE / TTB

LIST OF TOOLS, EQUIPMENT & TRAINING AIDS

Sr. No.	Tools / Equipment / Training Aids	Quantity (for 25 Trainees)	Rationalized Qty
1	Fire Extinguishers (CO_2, DCP, Foam, Water types)	8 (2 of each type)	4 (1 of each type)
2	Fire Hose, Nozzles & Hydrant Model	1 set	1 set
3	Self-Contained Breathing Apparatus (SCBA)	1 set	1 set
4	Full Face Respirators with Cartridges	2	1 set
5	Safety Helmets (different types, colors)	25	25
6	Safety Shoes (different sizes)	25	25
7	Safety Goggles & Face Shields	25	15
8	Safety Gloves (Cotton, Chemical, Heat Resistant)	25 pairs	25 pairs
9	Hearing Protection (Ear Muffs & Plugs)	25	10
10	Safety Harnesses with Lanyards	2	1
11	Confined Space Entry Tripod & Harness	1 set	1 set
12	Chemical Protective Suits (reusable)	2	1
13	Disposable Coveralls	10	5
14	First Aid Kits (complete sets)	5	2
15	CPR Training Manikins (Adult & Child)	2	1
16	AED Trainer Unit (Automated External Defibrillator)	2	1
17	Spill Response Kits (oil & chemical)	3	1
18	Gas Detectors (O_2, CO, H_2S, Combustible gases)	1	1
19	Noise Dosimeter / Sound Level Meter	1	1
20	Lux Meter (Light Measurement)	1	1
21	Portable Electrical LOTO Kits	2 sets	1 set
22	Scaffold Model (with joints & planks)	1	1
23	Ladders (different types) step ladder, extension ladder	2	1
24	Rigging Equipment (slings, shackles, eyebolts, hooks)	1 set	1 set

Sr. No.	Tools / Equipment / Training Aids	Quantity (for 25 Trainees)	Rationalized Qty
25	Portable Welding & Cutting Set (for hot work demo)	1	1 set
26	Portable Power Tools (Grinder, Drill, Cutter – for inspection demo)	1 set	1 set
27	Training Projector & Multimedia System	1	1
28	Whiteboard / Flip Charts	2	1
29	Safety Posters, Signage & PTW Forms	Multiple sets	Few sets
30	Computer with MS Office Suite	As required	As required
31	Reflective Jackets	25	25
32	Fire Suit (Proximity / Aluminized)	2	1
33	Fire Alarm / Detection System (basic demo unit)	2 set	1 set
34	Emergency Exit Signage with Lighting	2 set	1 set

LIST OF CONSUMABLE ITEMS

Sr. No.	Consumable Materials	Quantity (for 25 Trainees), 6 months
1	Fire extinguisher refilling materials (DCP powder, CO_2 cartridges, foam liquid)	5 refills
2	First aid consumables (bandages, gauze, antiseptics, splints, cotton, gloves)	5 full kits
3	Disposable nitrile/latex gloves	200 pairs
4	Disposable face masks & N95 respirators	200 pieces
5	Safety posters, leaflets, awareness materials	50 sets
6	Chart papers, markers, flip-chart sheets for safety training	50 sheets each
7	Batteries (for gas detectors, sound level meter, flashlights)	6
8	Spill absorbent materials (pads, granules, neutralizing powder)	25 kg
9	Disposable chemical coveralls	25
10	Ear plugs (foam type)	50 pairs
11	Sample PPE tags, inspection checklists, PTW forms	100 sets
12	Training report sheets, logbooks, registers	25 each
13	Drinking water bottles (for heat stress training)	50
14	Sand, kerosene/diesel for controlled fire training	50 cubic feet sand + 10 L kerosene
15	Rope, tapes, cones, and safety tags for drills	1 set

MINIMUM QUALIFICATION OF TEACHER / INSTRUCTOR

To ensure quality delivery, trainers for this course should possess a blend of technical knowledge, practical industrial experience, and teaching skills. while additional trainers or Visiting instructors may fulfill the optional/preferred qualifications.

- B.Sc. Engineering (any discipline) with internationally recognized certifications (IOSH or OSHA) and at least 1 year of HSE field experience in general industry. Foreign experience preferred.

Or

- Bachelor's degree (14 years of education) with a Post Graduate Diploma in OHS, along with international certifications (IOSH or OSHA) and at least 1 years of HSE field experience in general industry. Foreign experience preferred.

Or

- DAE / Intermediate qualification with an HSE certificate (3 or 6 months), supported by international certifications (IOSH or OSHA) and at least 5 years of HSE field experience in general industry. Foreign experience preferred.

Or

OPTIONAL / PREFERRED: ADDITIONAL CONDITION FOR TEVTA PERMANENT FACULTY

- Permanent TEVTA Teachers (B.Sc. Engineering or BS Technology or DAE) are also eligible to deliver this course.
- They must complete one-month specialized training related to topics of Advance HSE & Fire Safety Officer course before taking teaching responsibility.

EMPLOYABILITY OF PASS OUTS

Graduates of this course will be equipped with the knowledge and practical skills to take up employment in a wide range of industries, both in Pakistan and internationally (particularly the GCC countries where HSE demand is high). They will be able to work as entry-level Safety Officers, Supervisors, and HSE Coordinators, or provide specialized services such as fire safety, first aid, and environmental management.

The course also prepares trainees for self-employment opportunities, including consultancy, training, and community-based safety initiatives. Graduates may also progress towards supervisory roles (Safety Supervisor, HSE Coordinator) with 2–3 years field experience.

Employment Sector	Job Roles / Positions	Context / Opportunities
Construction & Infrastructure	Safety Officer, HSE Supervisor, Site Safety Coordinator	High demand in building, roads, bridges, housing projects, and mega infrastructure works (CPEC, Gulf construction).
Oil & Gas, Refineries & Petrochemical Plants	Fire & Safety Technician, HSE Assistant, PTW Coordinator	Strict international HSE requirements make this one of the largest employers for Safety Officers.
Manufacturing & Industry (Cement, Textile, Steel, Fertilizer, Sugar, Food Processing)	Industrial Safety Officer, Process Safety Assistant	Factories require compliance with Factories Act, ISO 45001, and environmental regulations.
Healthcare & Hospitals	Hospital Safety Officer, Infection Control Assistant, Fire Safety Technician	Safety roles in healthcare facilities, especially in fire safety, patient safety, and biological hazard management.
Power Plants & Utilities	HSE Coordinator, Fire & Safety Technician	Power generation and transmission companies employ HSE staff for safe operations.
Transport, Logistics & Warehousing	Fleet Safety Officer, Warehouse Safety Coordinator	Safety roles in handling transport fleets, container yards, and warehouses.

Employment Sector	Job Roles / Positions	Context / Opportunities
Government / Regulatory Bodies	Safety Inspector, Environmental Safety Assistant	OSH inspectorates, environment agencies, and municipal corporations need trained HSE staff.
Consultancy & Training Firms	Safety Auditor, Safety Trainer, Safety Consultant	Graduates may work with private consultancy companies or training institutes.
Self-Employment / Entrepreneurship	HSE Consultancy, Fire Equipment Supply, Safety Training Provider	Graduates can establish their own businesses in safety consultancy, PPE sales, or training services.

PATHWAYS FOR FURTHER PROFESSIONAL GROWTH:

In addition to direct employment opportunities, graduates of this course will also have the option to pursue advanced studies and professional certifications that will strengthen their career profile both nationally and internationally.

- **International Certifications:**
  OSHA 30-Hour (Construction/General Industry), IOSH Managing Safely, NEBOSH International General Certificate (IGC), ISO 45001 Lead Auditor, NVQ Level 6, OTHM Level 6, and Qualifi Level 6 Diplomas in Occupational Health & Safety (UK),
- **Higher Studies:**
  Bachelor's degrees in occupational health & safety, Environmental Sciences, or related fields.
- **Advanced Diplomas:**
  Postgraduate Diplomas offered by reputed universities in Pakistan, such as the PGD in Occupational Health & Safety, PGD in Environmental Health & Safety, and PG Diploma in Health Emergency & Disaster Management.

These pathways ensure that graduates remain competitive, adaptable, and aligned with global HSE standards, enabling them to work in Pakistan and abroad (particularly the GCC region).

REFERENCE & RECOMMENDED READING

- **International Standards & Guidelines**
  - ISO 45001:2018 – Occupational Health & Safety Management Systems – Requirements with Guidance for Use (International Organization for Standardization).
  - ILO Convention C161 – Occupational Health Services Convention, 1985.
  - OSHA 29 CFR 1910 – General Industry Safety and Health Standards (Occupational Safety & Health Administration, USA).
  - OSHA 29 CFR 1926 – Construction Industry Safety Standards (OSHA, USA).
  - Abu Dhabi Occupational Safety and Health System Framework (OSHAD-SF) – Codes of Practice 2017.
  - Saudi Aramco Safety Handbook & General Instructions (GI 2.100 series).
  - Oman Ministry of Manpower HSE Guidelines (Construction & Industrial Safety).
  - Qatar Construction Specifications (QCS 2014, HSE Sections).
  - NFPA 10 – Standard for Portable Fire Extinguishers (National Fire Protection Association, USA).
  - NFPA 30 – Flammable and Combustible Liquids Code.
  - NFPA 72 – National Fire Alarm and Signaling Code.
- **Pakistani Acts, Rules & Regulations**
  - Factories Act, 1934 (Pakistan) – Occupational health, safety, and welfare provisions for factory workers.
  - Workmen's Compensation Act, 1923 – Employer liability for workplace injuries and compensation rights.
  - Punjab Occupational Safety & Health Act, 2019.
  - Punjab Community Safety Act, 2021.
  - Punjab Community Safety Buildings Regulations 2022.
  - Pakistan Environmental Protection Act, 1997 – Governs pollution control, hazardous waste, and environmental safety.
  - Building Code of Pakistan (Fire Safety Provisions), 2016 – National fire safety requirements for buildings.
  - Labour Policy of Pakistan – National framework on worker welfare and safety.

- **Books & Learning Resources**
  - Hughes, P. & Ferrett, E. (2016). Introduction to Health and Safety at Work (NEBOSH-accredited, 6th Edition).
  - Reese, C. D. (2015). Occupational Health and Safety Management: A Practical Approach. CRC Press.
  - Goetsch, D. L. (2019). Occupational Safety and Health for Technologists, Engineers, and Managers (9th Edition). Pearson.
  - Ridley, J. & Channing, J. (2017). Safety at Work (8th Edition). Routledge.
  - Bahr, N. J. (2018). System Safety Engineering and Risk Assessment: A Practical Approach. CRC Press.
  - Ferry, T. S. (2002). Modern Accident Investigation and Analysis. Wiley.

COMMON TRADE-RELATED JARGON & ABBREVIATIONS IN HSE

Abbreviation / Term	Full Form / Meaning
OHS / OSH	Occupational Health & Safety
HSE / EHS	Health, Safety & Environment / Environment, Health & Safety
QHSE	Quality, Health, Safety & Environment
IMS	Integrated Management System
PPE	Personal Protective Equipment
LOTO	Lock Out / Tag Out
PTW	Permit to Work
SOP	Standard Operating Procedure
JSA / JHA	Job Safety Analysis / Job Hazard Analysis
RA / HIRA	Risk Assessment / Hazard Identification & Risk Assessment
CAPA	Corrective Action / Preventive Action
LTI	Lost Time Injury
MTI	Medical Treatment Injury
FAC	First Aid Case
NM / NMI	Near Miss / Near Miss Incident
TRIR	Total Recordable Incident Rate
LTIFR	Lost Time Injury Frequency Rate
DART	Days Away, Restricted or Transferred (OSHA metric)
ERP	Emergency Response Plan
ERT	Emergency Response Team
BA / SCBA	Breathing Apparatus / Self-Contained Breathing Apparatus
CPR	Cardiopulmonary Resuscitation
AED	Automated External Defibrillator
MSDS / SDS	Material Safety Data Sheet / Safety Data Sheet
GHS	Globally Harmonized System of Classification & Labelling of Chemicals
IH	Industrial Hygiene
WMS	Work Method Statement

Abbreviation / Term	Full Form / Meaning
HWP	Hot Work Permit
CSE / CSEP	Confined Space Entry / Confined Space Entry Permit
SWL / WLL	Safe Working Load / Working Load Limit
TAG System	Green/Red/Yellow tags for scaffold safety
BBS	Behavior-Based Safety
CSM	Contractor Safety Management
ISO 45001	OHS Management System Standard
ISO 14001	Environmental Management System Standard
ISO 9001	Quality Management System Standard
ILO	International Labour Organization
OSHA	Occupational Safety & Health Administration (USA)
NFPA	National Fire Protection Association (USA)
NSC	National Safety Council (USA)
Factories Act, 1934	Pakistan law on worker health, safety & welfare
PEPA, 1997	Pakistan Environmental Protection Act
POSHA, 2019	Punjab Occupational Safety & Health Act
BFP 2016	Building Code of Pakistan (Fire Provisions)

CURRICULUM DEVELOPMENT COMMITTEE

Advance Health, Safety, Environment & Fire Safety Officer – 6 Months (800 Hours)

Adeel Anjum Shabbir
HSE- Fire Safety Consultant P-TEVTA
TEVTA Secretariat, 96-H Gulberg-II, Lahore. **Convener**

Engr. Naveed Iqbal **Member**
District Emergency Officer Rescue 1122
Sialkot, Punjab Emergency Service Department

Engr. Nabeel Ahmed **Member**
Asst, Professor (PGD in OHS)
Preston University Islamabad Campus.

Advance HSE & Fire Safety (6 & 3-M)

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