

MAHARASHTRA STATE BOARD OF SKILL DEVELOPMENT EXAMINATION, MUMBAI

1	Name of Course	Advance Diploma in Safety Management																																																				
2	Course Code	(411218)																																																				
3	Max. No. of Students	25 Students																																																				
4	Duration	1 year (Fresher)	1 year (fresher / working professional)	6 months (fast –track for working professional)																																																		
5	Type	Part Time	Part time	Part-time																																																		
6	No. Of Days / Week	5 days	Classroom/ Online / Blended learning	Daily evening lectures Online Blended learning																																																		
7	No. Of Hours /Days	3 hours	14 hrs –Sat - Sun	3 hrs /day 4 days/week- Online – Live faculty 7 hrs – Sunday/ Classroom																																																		
8	Space Required	Theory = 250 sq feet Practical = as per requirement stated																																																				
9	Minimum Entry Qualification	For 1 year - Fresher Any Graduate – B.A., B-Com, Dip-Degree Eng. Etc. For 6 months – Working professional with 3 year of Industry experience Factory, sites, Infrastructure, Oil & Gas or Construction sites																																																				
10	Objective Of Course	To create high awareness for safety across all sectors across Industries To encourage people for all fields to embrace safe way of working as a way of Life Providing skilled manpower in Safety to the Industry Reducing the number of accidents in the Industry and adding \$ Bn to GDP (50% reduction in accidents and add to almost 3-5% to the GDP) Re-skilling existing man-power in the Industry for adopting safe working practices.																																																				
11	Employment Opportunity	Employment opportunity:- Safety Supervisor, Warden, Officer and Safety Manager																																																				
12	Teacher’s Qualification	Degree/ Diploma in Any branch of Engineering & Diploma in Industrial Safety. and 5 Years’ Experience of Industry experience related to Safety management																																																				
13	Training System	<div>Training System Per Week</div> <table><tr><td>Theory</td><td>Practical</td><td>Total</td></tr><tr><td>10 hrs</td><td>10 hrs</td><td>20 hrs</td></tr></table>				Theory	Practical	Total	10 hrs	10 hrs	20 hrs																																											
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14	Exam. System	<table><tr><th>Sr. No.</th><th>Paper Code</th><th>Name of Subject</th><th>TH/PR</th><th>Hours</th><th>Max. Marks / Grade</th><th>Min. Mark/ Grade</th></tr><tr><td>1</td><td>41121811</td><td>Industrial Safety</td><td>TH-1</td><td>3hrs.</td><td>100</td><td>50</td></tr><tr><td>2</td><td>41121812</td><td>Health Safety & Environment Management & Industrial Hygiene</td><td>TH-1</td><td>3hrs.</td><td>100</td><td>50</td></tr><tr><td>3</td><td>41121813</td><td>Safety, Health and Environmental Legislation</td><td>TH-3</td><td>3hrs.</td><td>100</td><td>50</td></tr><tr><td>4</td><td>41121821</td><td>Practical – I- / Case study based submission</td><td></td><td></td><td>A</td><td>D</td></tr><tr><td>5</td><td>41121822</td><td>Continuous Learning –Monthly assessment – Online (Grade)</td><td></td><td></td><td>A</td><td>D</td></tr><tr><td></td><td></td><td>Total</td><td></td><td></td><td>300</td><td>150</td></tr></table>				Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks / Grade	Min. Mark/ Grade	1	41121811	Industrial Safety	TH-1	3hrs.	100	50	2	41121812	Health Safety & Environment Management & Industrial Hygiene	TH-1	3hrs.	100	50	3	41121813	Safety, Health and Environmental Legislation	TH-3	3hrs.	100	50	4	41121821	Practical – I- / Case study based submission			A	D	5	41121822	Continuous Learning –Monthly assessment – Online (Grade)			A	D			Total			300	150
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Subject- 1 – Industrial Safety

Unit	Contents
1	Industrial Safety- Importance of Safety, Terminology, Where Do Accidents Happen?, How Do Accidents Occur? Why Do Accidents Occur? 5 E's engineering, types of Hazards, Machine accidents: Non-Machine accidents:
2	DIFFERENT TYPES OF PHYSICAL HAZARDS- Industrial Noise and its Measurement Sources of Noise Noise Control Measures Legal Provisions involving High Noise Levels Permissible Exposure in case of continuous noise Permissible Exposure level of impulsive Industrial Lightening & Ventilation Legal Requirements Methods of Achieving Good Illumination Heat and Ventilation Purpose of Ventilation Advantage of Ventilation Classification of Ventilation Control of Heat Exposure Forcible Entry Controlling Fires with Ventilation Salvaging with Use of Water
3	Practical's HIRA Exercise with case studies HIRA of actual sites – building, Mall, factory, site Hazard identification and reporting
4	Assessment
5	Workbook
6	Industrial Visit
7	Visit Report Writing

Subject- 2 - Health Safety and Environment Management

Unit	Contents
1	ECOLOGY & ENVIRONMENT Definitions , What is "Sustainability" , Ecology and The Future of Biology Levels of Staying Ecology , Ecology, Ecosystem and Habitants , The Individual Level Interactions , Ecosystem , Habitat , Biotic and Abiotic Environment , Biosphere Food Chains Biomes , Biomes , Atmosphere ,Structure of Atmosphere ,Greenhouse Effect ,Cryosphere , Cycling of Materials in The Ecosystem , Carbon Cycle ,Reservoir of Carbon in Nature ,Cycling/Pathways ,Nitrogen Cycle ,Sulphur Cycle ,Phosphorus, Calcium Cycles ,Acid Rains , Eutrophication ,Global Warming
2	MANAGEMENT OF HAZARDS AND RISKS Definitions, management commitment, performance measurement, health and safety committee, behavioural factors, health and safety training,
3	CONTROL OF WORKPLACE HAZARDS Introduction, objectives, workplace hazards, chemical hazards, physical hazards, biological hazards, ergonomic hazards, hazards due to heavy metal contamination,
4	ENVIRONMENTAL POLLUTIONS- Causes of Environmental Pollution, Effects of Environmental Pollution ,Air Pollution ,Water Pollution ,Soil Pollution , Noise Pollution , Odour Pollution , Thermal Pollution ,Wastes and Hazardous Wastes
5	ENVIRONMENT MANAGEMENT Human Quality of Life ,Human Environment , Natural Resources and the Concept of Goods, Services and Hazards , Environmental Management Systems ,Implementation of EMS ,Stages of an EMS ,Benefits of EMS , Strategic Benefits ,Basic Elements of EMS , Environmental Policy , Environment Management Plan (Planning) , Implementation (Doing) ,Checking and Corrective Action ,Management Review (Act) ,Environmental Impact Assessment, Environmental Impact Mitigation ,Environmental Monitoring ,Strategic Environmental Assessment (SEA) , Environmental Audit (EA) ,LEED Certification
6	ENVIRONMENTAL LAWS & LEGISLATIONS- Environment Protection Act, 1986, Types of National Environmental Law , Biodiversity Conservation Legislation Water Related Legislation in India , Forest-Related and Wildlife-Related Laws in India ,Waste-related and Pollution-related Laws in India ,Environmental Regulations, Guidelines and Standards
7	HEALTH AND SAFETY MANAGEMENT- Introduction objectives, introduction to OHS & MS , ISO-45001,management health and

	safety, health and safety policy, organizing, planning and implementation, evaluation, concept of safety culture,
8	ERGONOMICS INTRODUCTION Scope and Applications Ergonomics: Man, Machine & Environment Application of Ergonomics for Safety and Health Ergonomics of Rehabilitation (RTW) Basic Components for Ergonomic Plan Development , Understanding Ergonomics , How to Build a Return to Work Program , Ergonomics of Automation , Ergonomics of Visual Fatigue
9	Practical Industrial Hygiene audit Reporting Exposure to EMS /OH&S MS
10	Assessment
11	Workbook
12	Industrial Visit
13	Visit Report Writing

Subject –3 - Industrial Hygiene

Unit	Contents
1	OCCUPATIONAL HEALTH:- Working near Excavations, Common Site Injuries and their Prevention, Fractures and Dislocations , Heat Stroke and Heat Exhaustion , Treatment of Illness , Precautions in Paint & Solvent Handling , Tools , First aid , Cardio Pulmonary Resuscitation ,First aid for many injuries
2	INDUSTRIAL HYGIENE- Industrial Hygiene, Worksite Analysis, Recognizing And Controlling Hazards , Anticipation , Recognition, Evaluation , Prevention , Recognizing & Controlling Hazards , Examples of Job Hazards Control
3	DOSE RESPONSE RELATIONSHIP IN TOXICOLOGY-

	Measure of Exposure, Dose-Effect Relationships, Toxicity Rating Scale and Labelling, Requirements for Pesticides
4	PERSONAL EXPOSURE MONITORING- Indoor Pollution Monitoring, Common Locations & Applications , Conduction of Exposure Monitoring
5	COMMON OCCUPATIONAL DISEASE- Prevention of Occupational Diseases, Most Common Occupational Diseases & Work Related Accidents and Diseases, Toxic Effects , Preventing Occupational Diseases or Aggravation of Existing Diseases , Recognizing Risks/Hazards or Health & Safety Problems , Preventing Occupational Health Diseases , Key Criteria for Diagnosing an Occupational Disease in an Individual COMPENSATION FOR OCCUPATIONAL DISEASES- Deciding Amount of Compensation, Calculating the Amount of Compensation, How Much Should is Paid?
6	LIST OF NOTIFIABLE DISEASES- List of Notifiable Diseases in India, List of Occupational Diseases
7	Practical HIRA Industrial Hygiene audit Reporting Audit and reporting
8	Assessment
9	Workbook
10	Industrial Visit
11	Visit Report Writing

Subject – 4- Safety, Health and Environmental Legislation

Unit	Contents
1	THE FACTORIES ACT, 1948 (AMENDED) AND RULES : Factories Act. Provisions under the Act and Rules made there-under with Amendments Case Laws under the Factories Act.

2	SOCIAL SECURITY – LEGISLATIONS : Workmen's Compensation Act and Rules. ESI Act and Rules. Contract Labour (Abolition and Regulation) Act. Public Liability Insurance Act. Social Accountability 8000 SA-8000.
3	SAFETY, HEALTH AND ENVIRONMENT (SHE), RELATED IMPORTANT LEGISLATION : Sections pertaining to SHE. Indian Boilers Act, 1923 with allied Regulations, 1961. Indian Electricity Act, 2003 and Rules, Indian Explosives Act, 1984 and Rules. Petroleum Act and Rules. Gas Cylinders Rules. Calcium Carbide Rules. The Insecticides Act and Rules. Radiation Protection Rules. Hazardous Material Transportation Rules.
4	Static and Mobile (Unfired) Pressure Vessel Rules, 1981 as amended in 2000. The Dock Workers (Safety, Health & Welfare) Act 1996 and Rules and Regulations. The Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996. The Building and other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998. The Building and other Construction Worker's Welfare Cess Act, 1996 Cess Rules, 1998.
5	ENVIRONMENT PROTECTION LEGISLATIONS : Water (Prevention & Control of Pollution) Act 1974 and Rules. Air (Prevention and Control of Pollution) Act 1981 and 1982 and Rules. Motor Vehicles Act, 1988 as amended in 2000, The Central Motor Vehicles Rules, 1989 as amended in 2000, The Maharashtra Motor Vehicles Rules, 1989 and Transport of Hazardous Goods Rules. Environment Protection Act 1986 (<i>Amended</i>) and Rules. MSIHC Rules. Noise Pollution Act, 1998, Bio-Medical Waste, Hazardous Waste Management Rules. Chemical accidents (Emergency preparedness, planning and response) Rule 1986. The batteries management handling rules 2001.
6	Practical HIRA Audit & reporting
7	Assessment
8	Workbook
9	Industrial Visit
10	Visit Report Writing

Subject – 5 – Safety In Engineering Industry

Unit	Contents
1	INTRODUCTION : Introduction to various hot and cold processes in Engineering industry including manufacture of various grades of steel.
2	PRINCIPLES OF MACHINE GUARDING Guarding during maintenance, Zero Mechanical State (ZMS), Definition, Policy for ZMS – guarding of hazards - point of operation protective devices, machine guarding, types, fixed guard, interlock guard, automatic guard, trip guard, electron eye, positional control guard, fixed guard fencing- guard construction- guard opening. Selection and suitability: lathe-drilling-boring- milling-grinding-shaping-sawing-shearing-presses-forge hammer-flywheels- shafts-couplings-gears-sprockets wheels and chains-pulleys and belts-authorized entry to hazardous installations-benefits of good guarding systems.
3	HOT WORKING FOUNDRY OPERATION : Flow sheet for foundry operation including use of different types of furnaces in each of the operation. Health hazards and safe methods of operation. Die casting. Fettling operations, Short blasting, sand blasting etc. FORGING OPERATION : Hazards in forging operations. Preventive maintenance of forging machines. Safework practices in forging operations. Safety in the use, handling and storage of dies. Safety on die changing. HOT ROLLING MILLS OPERATION : Hazards in hot rolling operations and their control measures, safety in hot rolling mills
4	COLD WORKING : Safety in the use of 1) power presses (all types) 2) shearing, 3) bending, 4) rolling, 5) drawing, 6) turning, 7) drilling, 8) boring, 9) milling, shaping 10) planning broaching, 11) grinding, 12) Computerized Numerically Controlled Systems. Need for selection and care of cutting tools. Preventive maintenance, periodic checks for safe operation. Associated hazards and their prevention. Safety in the machine tools.
5	OTHER OPERATIONS : Safety precaution in 1) Welding 2) Cutting 3) Brazing, 4) Soldering and Metalising and Chiseling, Blasting Operations. Safety in selection, care and maintenance of the associated equipment and instruments. Safety in finishing operation like a) cleaning b) polishing and c) buffing and their c) related hazards. Safety in maintenance and use of these machines.
6	HEAT TREATMENT : Hazards in various heat treatment operations. Control and Prevention.
7	SAFETY IN FINISHING, INSPECTION AND TESTING Heat treatment operations, electro plating, paint shops, sand and shot blasting, safety in inspection and testing, dynamic balancing, hydro testing, valves, boiler drums and headers, pressure vessels, air leak test, steam testing, safety in radiography,
8	personal monitoring devices, radiation hazards, engineering and administrative controls, Indian Boilers Regulation. Health and welfare measures in engineering industry-pollution control in engineering industry industrial waste disposal.
9	Practical HIRA Audit

	Machine Guarding
	Safety guard types and selection
10	Assessment
11	Workbook
12	Industrial Visit
13	Visit Report Writing

Subject-6 – Safety Construction Industry

Unit	Contents
1	MEANING AND SCOPE OF SAFETY IN CONSTRUCTION : Basic philosophy peculiarities and parameters governing the safety in construction such as site planning and layout, safe access, good housekeeping. Safety in the use of construction machinery. Seismic structural soundness. Structural safety, accident and hazards their causes and effects.
2	SAFETY IN CONSTRUCTION OPERATIONS : (a) Underground Works : Excavation, drilling and blasting pre-matic, trenching, shorting porklain type of shoring, strutting, tunnelling, piling and Safety in using and operating machinery and equipment relating to the above works. Foundations : Plant & Machinery and Structure (b) Above Ground Works : Scaffolding, shuttering / form work, ladders, concrete, cofferdams and special operation connected with irrigation work. Safety in use and portion of related machinery and equipment. Safety on working on fragile roof. Working at Heights. (c) Underwater portions : Well sinking, caissons underwater concreting, cofferdams and special operations connected with irrigation work. Safety in use of machinery and equipment related to underwater portions. (d) Movement of Construction Machinery : Heavy/Long Items. Earth Movers equipment Railway wagons, motor trucks, Materials Vehicles etc., Hazardous Materials, Material handling equipment. (e) Special Works : High rise buildings, bridges and tunnels, roads, railways, asphalting, pneumatic caissons, electrical installations and lifts. (f) Safety in Prevention and Protection at Work Site including the collapsing of the structure. g) Safety in use of explosives : Open cost machinery, quarrying. Project Management and Constructions in Safety : Introduction, Manpower utilisation, utilization of material, equipment and tools. Temporary installation and structures.
3	Safety in Demolition Operations : Planning and Permit. Planning the sequence of demolition. Safety Precautions to be taken for and during demolition carrying out repairs, additions and alterations.

4	SAFETY WITH REGARD TO STORAGE, STOCKING AND HANDLING OF MATERIALS OF CONSTRUCTION: Health hazards while handling construction material and chemicals; safety measures with respect to handling of materials such as cement, limes, aggregates, flash, timber, steel, glass, paints, varnishes, petroleum products chemicals used in construction, plastics & PVC material etc.
5	ACCIDENT PREVENTION : Occupational Health Hazards, Occupational diseases relating to construction work. Safety in the use and maintenance of personal protective equipment specific to construction industry, health and welfare measures, emergency medical treatment of injuries and rehabilitation at construction site.
6	STATUTORY OBLIGATIONS : Regulation of employment and condition of work in construction. Construction Safety Laws, IS AND NB Codes, Local Building and Development Laws, Accident Investigation and reporting, structure stability and precautions to be taken. The Building and other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998. 7.1 The Building and other Construction Worker's Welfare Cess Act, 1996 Cess Rules, 1998.
7	Special precautions for works of Engineering construction like distilling / fractionating columns, chimney, silos-oil and gas installations, transmission/ communication lines, cable car installations, air fields.
8	Practical Hazard Identification & Reporting HIRA Audit PPE 45001 OHS & MS
9	Assessment
10	Workbook
11	Industrial Visit
12	Visit Report Writing

Assessment methodology

1. Continuous assessment using workbooks
2. MCQ based assessment at topic level
3. Descriptive test
4. Project work based on Site visit/implant/internship/site project/process
5. Test paper is based on 50% theory and 50% practical case-studies

Materials List

- Aspirator Hygrometer (1 No)
- Kata-Thermometer (1 No)
- Globe-Thermometer (1 No)
- Sound Level Meter (1 No)
- Road safety signals and symbols. (1 No)
- Glass Impinger tubes. (1 No)
- Aspirator Bottle. (1 No)
- Fire Extinguisher. (1 No)
- First Aid Box (1 No)
- Anthropometer (1 No)
- Skin Fold Calliper (1 No)

Reading Material & Links

Industrial Hygiene

https://www.osha.gov/dte/library/industrial_hygiene/industrial_hygiene.pdf
<http://ocw.jhsph.edu/courses/PrinciplesIndustrialHygiene/PDFs/Lecture1.pdf>

Quality control

<http://portal.ciop.pl/CIOPPortalWAR/file/72424/2013121133150%26R1997-V3-N1-2-str3-14.pdf>
<https://www.hse.gov.uk/involvement/inspections.htm>

https://www.osha.gov/sites/default/files/2018-12/fy11_sh-22318-11_Mod_3_ParticipantManual.pdf
https://www.westernsydney.edu.au/__data/assets/pdf_file/0020/12917/12917_Hazard_Identification,_Risk_Assessment_and_control_Procedure.pdf

Eng-II

http://www.in.kpmg.com/pdf/indian_sugar_industry.pdf
<http://164.100.47.193/intranet/sugar.pdf>

Legislation

https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@webdev/documents/publication/wcms_082361.pdf
https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---declaration/documents/publication/wcms_095895.pdf
<https://www.ilo.org/public/english/download/glance.pdf>

HSE

https://hr.un.org/sites/hr.un.org/files/4.5.1.6_Strategic%20Planning%20Guide_0.pdf
<http://www.nmac.org/wp-content/uploads/2015/04/Strategic-Planning.pdf>

Chemical Safety

<https://etshare.pbworks.com/f/Chapter%2017.pdf>
https://www.hsa.ie/eng/Publications_and_Forms/Publications/General_Application_Regulations/General_Application_Amendment_Regulations_Pressure_Systems.pdf

INDUSTRIAL SAFETY

https://www.researchgate.net/publication/265099084_Industrial_Noise_Pollution_and_its_Impacts_on_Workers_in_the_Textile-Based_Cottage_Industries_An_Empirical_Study

https://ehs.oregonstate.edu/sites/ehs.oregonstate.edu/files/pdf/incident_investigation_report.pdf

OIL & GAS

<https://personal.ems.psu.edu/~radovic/Chapter8.pdf>

<https://personal.ems.psu.edu/~radovic/Chapter8.pdf>

CONSTRUCTION SAFETY

https://www.iwh.on.ca/sites/iwh/files/iwh/tools/ohs_vulnerability_measure_questionnaire_2016.pdf

https://www.ihsa.ca/pdfs/magazine/volume_16_Issue_2/top-10-construction-hazards.pdf

ENVIRONMENT

<http://ccc.chem.pitt.edu/wipf/Web/HCH.pdf>

Books List

1. National Safety Council publications
2. Industrial Act 1948
3. Industrial Safety & Environment – A. K. Gupta
4. Fundamental Industrial Safety & Health – K. U. Mistry
5. Other private publications
6. Trainer Notes

