Kurukshetra University, Kurukshetra

(Established by the State Legislature Act-XII of 1956)
("A++" Grade, NAAC Accredited)

Syllabus
for
Post Graduate Programme

Post Graduate Diploma in Health, Safety and Environment

as per NEP 2020
Curriculum and Credit Framework for Postgraduate Programme

With Internship and CBCS-LOCF
With effect from the session 2025-26

INSTITUTE OF ENVIRONMENTAL STUDIES
FACULTY OF LIFE SCIENCE

KURUKSHETRA UNIVERSITY, KURUKSHETRA -136119

HARYANA, INDIA

Session: 2025-26			
Part A - Introduction			
Name of Programme	Post Graduate Diploma in Health, Safety and Environment		
Semester	Ist semester		
Name of the Course	Introduction to Health, Safety and Environment		
Course Code	P25-HST-101		
Course Type	CC-1		
Level of the course	400-499		
Pre-requisite for the course (if any)	Nil		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Have knowledge of the different safety equipments and their uses, and safety measures in different facilities. CLO 2: Acquire knowledge of the accidents, types and their preventive measures. CLO 3: Understand the health and welfare facilities required and available in different facilities. CLO 4: Have knowledge of Principles and Practices used for Prevention & Control of Environment Protection at different facilities.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	Introduction to safety equipments and their uses. Introduction of first aid, Road safety. Knowledge of General Safety, Occupational health and hygiene.	15
II	**Health:** Cleanness, Disposal of Waste, Ventilation and Temperatures, Dust & Fumes, Drinking Water, Lighting, Latrines & Urinals. **Safety:** Fencing of machineries, Work on or near machinery in motion, Hoists and lifts, Pressure plants, Floors, Stairs and means of escape, Protection against fumes & gases, Safety offers.	15
III	**Accident:** Definition of Accidents, Classification of Accidents, Need for the Analysis of Accidents, Methods Adopted for Reducing Accidents, Investigation of Accidents, Safety Slogans. **Welfare:** Washing facilities in Dry clothing, Storing, Sitting, First Aid Appliances, Canteen, Shelters for rest & lunch, Crèches.	15
IV	**Environment Protection:** Safety and Protection of existing environment.	15

	Principles & Practices used for Prevention & Control of Pollution: Water, Air, Soil and Noise. Introduction to Hazardous Waste Management.	
	Total Contact Hours	60

Suggested Evaluation Methods			
Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Simon Watson Pain. (2018). Safety, Health and Environmental Auditing - A Practical Guide. CRC Press.
2. K.T. Narayanan. (2017). Safety, Health and Environment Handbook. McGraw Hill Education.

Session: 2025-26			
Part A - Introduction			
Name of Programme	Post Graduate Diploma in Health, Safety and Environment		
Semester	Ist semester		
Name of the Course	Industrial Hygiene and Occupational Health		
Course Code	P25-HST-102		
Course Type	CC-2		
Level of the course	400-499		
Pre-requisite for the course (if any)	Nil		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Recognize effective industrial hygiene practices and aspects of chemical hazards that ensure a safer and healthier workplace for workers. CLO 2: Equips students with the training to use personal protection devices required for the protection of individuals from health injuries during specific types of industrial work. CLO 3: Acquire knowledge and practical skills related to identifying and addressing common health issues specific to various occupations. CLO 4: Have knowledge about periodic medical examinations of workers and understanding of the application of Ergonomics for Industrial Safety.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	**Industrial Hygiene**: Definition, control methods, substitution, changing the process, isolation, wet method, local exhaust ventilation, personal hygiene, housekeeping and maintenance, waste disposal, special control measures. **Chemical hazards**: Introduction, dangerous properties of chemicals, dust, gases, fumes, mist, vapors, smoke, and aerosols; Route of entry to the human system, recognition, evaluation, and control of basic hazards. Concept of dose-response relationship, biochemical action of toxic substances; Concept of threshold, limit values, personnel exposure monitoring; work environment monitoring, biological sampling and analysis.	15
II	**Personal Protective Equipment:** Need, selection, applicable standards, supply, use, care, and maintenance of respiratory and non-respiratory personal	15

	protective equipments. **Respiratory personal protective devices:** Classification of respiratory personal protective devices. Selection of respiratory personal protective devices. **Non-respiratory personal protective devices:** Head protection, ear protection, face and eye protection, hand protection, foot protection, body protection. Instructions and training in the use, maintenance and care of self-containing breathing apparatus. Testing Procedures and Standards.	
III	**Occupational Health:** Definition, Aims and Scope. **Common Occupational Disease:** Occupations involving risk of contacting diseases (mode of causation of the diseases and its effects, and diagnostic methods), Biological monitoring (method of prevention, compensation for occupational diseases), Evaluation of injuries, Occupational Health Management Services at the workplace, List of notifiable diseases in Schedule III of Factories Act - 1948. **Occupational Health Hazards:** Adverse health effects of noise, vibration, cold, heat stress, improper illumination, thermal radiation, ionizing and non-ionising radiations. Permissible threshold exposure limits: short-term and long-term effects of exposures, preventive and control measures.	15
IV	**Diagnostic Measures:** Pre-employment and periodic medical examination of workers. Medical surveillance for control of occupational diseases and health records. Fundamentals of First-Aid-Burns, Fractures, Suffocation, Toxic Ingestion - Bleeding Wounds and Bandaging, Artificial Respiratory Techniques. **Ergonomics:** Introduction, Aims and Scope, Man-machine (Job), Environment System, Constituents of Ergonomics, Application of Ergonomics in Industry for Safety, Health and Environment. **Industrial Hygiene:** Definition, control methods, substitution, changing the process, isolation, wet method, local exhaust ventilation, personal hygiene, housekeeping and maintenance, waste disposal, special control measures.	15
	Total Contact Hours	60

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Reed, S., Pisaniello, D., & Benke, G. (Eds.). (2020). Principles of Occupational Health and Hygiene: An Introduction. Routledge.

2. Cavallari, J., Zwack, L., & Roelofs, C. (2024). Industrial hygiene and the physical work environment. In: L. E. Tetrick, G. G. Fisher, M. T. Ford, & J. C. Quick (Eds.), Handbook of occupational health psychology. Third Ed., American Psychological Association.

3.Yamamoto, D. P. (2020). Industrial Hygiene: A Foundational Role in Total Exposure Health. In Total Exposure Health. CRC Press.

4.Cohrssen, B. (Ed.). (2021). Patty's Industrial Hygiene, Volume 1: Hazard Recognition. John Wiley & Sons.

5. Friend, M. A., Kohn, J. P. (2007). Fundamentals of occupational safety and health. Eiht Ed., Rowman & Littlefield Publishing.

6. Spellman, F. R. (2017). Industrial hygiene simplified: A guide to anticipation, recognition, evaluation, and control of workplace hazards. Bernan Press.

Session: 2025-26			
Part A - Introduction			
Name of Programme	Post Graduate Diploma in Health, Safety and Environment		
Semester	Ist semester		
Name of the Course	Environmental Pollution and Control		
Course Code	P25-HST-103		
Course Type	CC-3		
Level of the course	400-499		
Pre-requisite for the course (if any)	Nil		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Develop an understanding of the sources, parameters, standards and treatment for water quality. CLO 2: Learn the standards and fate of different Air pollutants along with their impacts and emission control devices. CLO 3: Provide insight in to the sources, types, parameters, standards of noise pollution and its control measures. CLO 4: Provide insight in to the sources, types, parameters, effects of soil pollution and its prevention and control measures.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	**Water Pollution and Water Quality Control:** Water Resources, Sources and types of water pollutants, Water Quality Parameters, Standards, Treatment of Water (Domestic and Industrial): Primary (Screening, Grit Chamber, Equalization Basins, Primary Settling, Sedimentation with Coagulation and Flocculation) and Secondary Treatment Systems (Activated Sludge Process, Trickling Filter, RBC, Oxidation Ponds, Nitrogen and Phosphorous Removal).	15
II	**Air Pollution and air Quality Control:** Type of Pollutants, Chemical Composition. Sources and Effects of Major Air Pollutants- CO, SOx, NOx, Hydrocarbons, Ozone, Photochemical Oxidants, Lead, Particulate Matter. Emission Controls: Control Devices for Particulate Pollutants - Gravity Settling Chambers, Centrifugal Separators, Wet Scrubber, Electrostatic precipitator, Fabric filters, Control devices for Gaseous Pollutants- Adsorption, Absorption, Condensation and Combustion. Introduction to Indoor Air Pollution.	15

III	**Noise Pollution and its Control:** Sources and types of noise pollution, Noise measuring instruments and measuring procedure, Noise standards and limits, auditory and non auditory effect of Noise Pollution on human health, prevention and control measures of noise.	15
IV	**Soil Pollution and its Control:** Sources and types of soil pollution, parameters of soil pollution, Techniques for monitoring of soil pollution, effect of Pollution on soil, effect of soil Pollution on ecosystem, Risk associated with soil pollution, Prevention and control of soil pollution.	15
	Total Contact Hours	60

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Mackenzie L. Davis and David A. Cornwell. (Eds.). (2008). Introduction to Environmental Engineering. Fourth Ed., McGraw-Hill Book.
2. Nemerow, N. L. (2009). Environmental Engineering: Water, Wastewater, Soil and Groundwater Treatment and Remediation. Sixth Ed., Hoboken: Wiley.
3. Pierzynski, G.M., Vance, G.F. and Sims, J.T. (2000). Soils and Environmental Quality. Second Ed., CRC press, New York.
4. Singh, J.S., Singh, S.P. and Gupta, S.R. (2015). Ecology, Environment and Resource Conservation, S. Chand Publishing, New Delhi.
5. Vallero, D. A. (2014). Fundamentals of air pollution. Academic press.

Session: 2025-26			
Part A - Introduction			
Name of Programme	Post Graduate Diploma in Health, Safety and Environment		
Semester	Ist semester		
Name of the Course	Environmental Management		
Course Code	P25-HST-104		
Course Type	CC-4		
Level of the course	400-499		
Pre-requisite for the course (if any)	Nil		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Assess the life cycle of industrial products and industrial waste management. CLO 2: Provide insight in to the pollution control methodologies in industries and protect the environment for sustainable growth of society. CLO 3: Apply the concepts and principles of environmental management systems, environmental impact assessment and environmental economics. CLO 4: Study the quality and EMS standards and the concept of ergonomics.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	Sustainable Development: Concept of Sustainable Development and its Role in Building of Environment, Background, Life Cycle Assessment, Source Reduction, Collection and Transfer Operations, Recycling and Composting, Discarded Materials, Waste to Energy Combustion, Landfills, Hazardous Waste Management.	15
II	Pollution Control in Process Industries - Pollution Control Methodologies: Pollution Control in Process Industries like Cement, Paper, Petroleum - Petroleum Products, Textile, Tanneries, Thermal Plants. Hazardous Waste Treatment Technologies, Physical Treatment - Sedimentation, Adsorption, Aeration. Ion Exchange, Electro Dialysis. Chemical Treatment- Precipitation, Biological Remediation Techniques, Incineration and Land Disposal. Eco-Friendly Energy and Environment.	15
III	Environmental Management System: EIA - Introduction, Need and Scope, Process and Methodologies, EMP and DMP needs with HAZAN and HAZOP Studies, Environmental Economics: Rules of Taxation, Cess, Water Charges, Biodiversity Damage Assessment and Price Evaluation.	15

IV	OHSAS Standard, ISO 14000 Series, ISO 9001.Applied Ergonomics: Load Carrying, Hand tools and their use, Machine Controls and Displays, Heat, Noise, Emergencies, General upkeep, welfare.	15
	Total Contact Hours	60

Suggested Evaluation Methods			
Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Mackenzie L. Davis and David A. Cornwell. (Eds.). (2008). Introduction to Environmental Engineering. Fourth Ed., McGraw-Hill Book.
2. Nemerow, N. L. (2009). Environmental Engineering: Water, Wastewater, Soil and Groundwater Treatment and Remediation. Sixth Ed., Hoboken: Wiley.
3. Whitelaw, K. (2012). ISO 14001 environmental systems handbook. Routledge.
4. Harris, J.M., Wise, T.A., Gallagher, K.P. and Goodwin, N.R. (2001). A Survey of Sustainable Development: Social and Economic Dimensions. Island Press, Washington, D.C.

Session: 2025-26			
Part A– Introduction			
Name of the Programme	Post Graduate Diploma in Health, Safety and Environment		
Semester	Ist semester		
Name of the Course	Practical-I		
Course Code	P25-HST-105		
Course Type	PC-1		
Level of the course	400-499		
Pre-requisite for the course (if any)	NA		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Have knowledge of the different safety measures to be applied in different situations/facilities. CLO 2: Understand the health and welfare facilities required and available and Practices used for Prevention & Control of Environment Protection in different facilities. CLO 3: Have knowledge of effective industrial hygiene control and occupational health hazards measures. CLO 4: Equip students to use personal protection devices and techniques used to protect from health injuries at workplace.		
Credits	**Theory**	**Practical**	**Total**
	0	**4**	**4**
Teaching Hours per week	0	**8**	**8**
Internal Assessment Marks	0	**30**	**30**
End-Term Exam Marks	0	**70**	**70**
Max. Marks	0	**100**	**100**
Examination Time	4 hours		
Part B-Contents of the Course			
Practicals			**Contact Hours**

1. To understand about the safety measures for prevention of road accidents. 2. To make a list of possible risk in working laboratory and suggest safety measures for its prevention. 3. To study about the safety measures for protection against fumes and gases. 4. To calculate the air quality index of a given area. 5. To understand about First Aid appliances. 6. Study of respiratory personal and non-respiratory protective devices and their usage in industry. 7. Study of industrial hygiene control methods. 8. Study of preventive and control measures of occupational health hazards. 9. Occupational health management services at the workplace - A case study. 10. Evaluation of Environmental Stress (Heat) and Physical Fitness Test (PFI Test).	120

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Practicum**	**30**	➢ **Practicum**	**70**
• Class Participation:	5	Lab record, Viva-Voce, write-up and execution of the practical	
• Seminar/Demonstration/Viva-voce/Lab records etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Safety, Health and Environmental Auditing - A Practical Guide. (2018). Simon Watson Pain, CRC Press.

2. Spellman, F. R. (2017). Industrial hygiene simplified: A guide to anticipation, recognition, evaluation, and control of workplace hazards. Bernan Press.

Session: 2025-26			
Part A–Introduction			
Name of the Programme	Post Graduate Diploma in Health, Safety and Environment		
Semester	Ist semester		
Name of the Course	Practical-II		
Course Code	P25-HST-106		
Course Type	PC-2		
Level of the course	400-499		
Pre-requisite for the course (if any)	NA		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Assess the water and air quality in environment. CLO 2: Measure the noise and soil quality in environment. CLO 3: Assess the pollution control in different industries. CLO 4: Assess the EMS implementation in industries.		
Credits	**Theory**	**Practical**	**Total**
	0	**4**	**4**
Teaching Hours per week	0	**8**	**8**
Internal Assessment Marks	0	**30**	**30**
End-Term Exam Marks	0	**70**	**70**
Max. Marks	0	**100**	**100**
Examination Time	4 hours		
Part B-Contents of the Course			
Practicals			**Contact Hours**

1. Monitor the criterion pollutants of air quality parameters ($PM_{2.5}$, SO_x, NO_x) at different locations and compare it with NAAQS. 2. Analyze the water quality parameters such as pH, EC, TDS, turbidity, and DO (Dissolved Oxygen) and Compare the results with water quality standards (WHO or regional standards). 3. Assessment of heavy metal toxicity in given water sample 4. Analyse the soil quality parameters such as pH, EC, TDS, salinity and nutrient availability in soil samples. 5. To calculate the noise using sound level meter. 6. Assessment of pollution control in Industries. 7. Life Cycle assessment case study of an industrial product. 8. EMS implementation in an industry - a case study. 9. Study of pollution related taxation and penalties. 10. Visit a process industry and analyze their pollution control measures and working.	120

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Practicum**	**30**	➢ **Practicum**	**70**
• Class Participation:	5	Lab record, Viva-Voce, write-up and execution of the practical	
• Seminar/Demonstration/Viva-voce/Lab records etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Rice, E. W., Bridgewater, L. and American Public Health Association (Eds.). (2012). Standard methods for the examination of water and wastewater (Vol. 10). Washington, DC: American Public Health Association.

2. Bartram, J. and Ballance, R. (1996). Water quality monitoring: a practical guide to the design and implementation of freshwater quality studies and monitoring programmes. CRC Press.

3. Jones, J. (2018). Soil analysis handbook of reference methods. CRC press.

4. Harris, J.M., Wise, T.A., Gallagher, K.P. and Goodwin, N.R. (2001). A Survey of Sustainable Development: Social and Economic Dimensions. Island Press, Washington, D.C.

Session: 2025-26	
Name of the Programme	Post Graduate Diploma in Health, Safety and Environment
Semester	Ist Semester
Name of the Course	SEMINAR
Course Code	P25-HST-107
Course Type: (CC/DEC/PC/Seminar/CHM/OEC/EEC)	SEMINAR
Level of the course	400-499
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Demonstrate a sound technical knowledge of the seminar topic. CLO 2: Improves his/her presentation skills and develop confidence.
Credits	Seminar
	2
Teaching Hours per week	2
Max. Marks	50
Internal Assessment Marks	0
End Term Exam Marks	50
Examination Time	1 hour
Instructions for Examiner: Evaluation of the seminar will be done by the internal examiner(s) on the parameters as decided by staff council of the department. There will be no external examination/viva-voce examination.	

Session: 2025-26			
Part A - Introduction			
Name of Programme	Post Graduate Diploma in Health, Safety and Environment		
Semester	II[nd] semester		
Name of the Course	Safety at Workplace		
Course Code	P25-HST-201		
Course Type	CC-5		
Level of the course	400-499		
Pre-requisite for the course (if any)	Nil		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Articulate the importance of workplace safety, identify potential hazards, and formulate and implement effective safety policies tailored to specific industries. CLO 2: Assess and manage safety risks associated with the formation of dust, gases, and vapour clouds in industrial processes. CLO 3: Identify various causes of fire incident and their prevention measures. CLO 4: Formulate comprehensive fire emergency action plans, considering various components and stakeholders.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	Introduction to Workplace Safety, Safety Management, Safety Policy, Safety Committee, Safety Review, Responsibility of Management, Safety Officers, Duties & Responsibilities, Safety Targets; Motivation & Communication as part of Safety Programme. Safety in Boilers; Engineering Industry, Textile Industry, Electrical Safety: Electrical Hazard, Static Electricity. Safety precautions in use of Boilers. Preservations of boilers when not in use. Steam pressure. Pressure gauge, Treatment of feed water. Safety in the use of Machines, Safety precautions while using Hand Tools & Power Tools, Selection, Maintenance & Care of Hand and power tool.	15
II	Chemicals & Colour Codes: UN &other classification of chemicals & colour coding, Safety in chemical industry; Safety in case of Emissions and Dispersion, Liquid Discharge, Gas Discharge and leakage; Safety related to Excavation. Precautions in processes and operations involving Explosive, Toxic	15

	Substances, Dusts, Gases, Vapour Clouds Formation and Combating, Workplace Exposure Limits, Control Measures.	
III	Chemistry, classification and causes of fire, factors contributing towards fire. Determination of fire load. Prevention of fire: Design of building plant, exits, fire resistant building materials; Fire extinguisher types and usage; Emergency exits and evacuation routes; emergency lighting and alarm systems, fire suppression systems, BLEVE (Boiling liquids expanding vapour explosion).	15
IV	Components of fire emergency action plan. Deflagration and detonation. Assessment of fire explosion and toxicity index, Dow & Mond, dispersion, Probability analysis, modelling. Pressure vessels fired and unfired, codes of practices governing their safety. Assessment of reliability of vessels, test checks. Inspection techniques for plants, reaction vessels, check list for routine inspection, checklist for specific maintenance and break down. Corrosion and erosion, location, causes, inspection and prevention; Emergency evacuation procedures; communication protocols during a fire emergency.	15
	Total Contact Hours	60

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Industrial Safety Management: Hazard Identification and Risk Control. L. M. Deshmukh. McGraw Hill, ISBN: 9780070617681

2. Chemical Process Industry Safety. K. S. N. Raju. McGraw Hill, ISBN: 9789332902787

3. Industrial Accident Prevention: A Safety Management Approach. H. W. Heinrich, D. Petersen, N. R. Roos. McGraw-Hill, ISBN: 9780070280618

4. Safety, Health and Environment Handbook. (2017). K.T. Narayanan. McGraw Hill Education.

Session: 2025-26			
Part A - Introduction			
Name of Programme	Post Graduate Diploma in Health, Safety and Environment		
Semester	II[nd] semester		
Name of the Course	Legal and Socio-economic Aspects of Health, Safety and Environment - Part I		
Course Code	P25-HST-202		
Course Type	CC-6		
Level of the course	400-499		
Pre-requisite for the course (if any)	Nil		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Acquire values and attitude towards various constitutional framework governing worker's safety and security in India. CLO 2: Acquire values and attitude towards various constitutional framework governing security of worker's employment and insurance issues. CLO 3: Have in-depth knowledge of various legislations related to handle explosions and accidents in India. CLO 4: Acquire knowledge about the Occupational Health & Safety measures followed for workers in India as per International standards.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	Provisions under the Act and Rules made there-under with Amendments from time-to-time: The Factories Act, 1948; Dock Workers (Safety, Health and Welfare) Act, 1986; Workmen's Compensation Act, 1923; Public Liability Insurance Act, 1991.	15
II	The Building and other Construction Worker's Welfare Cess Act 1996 & Cess Rules 1998; The Building and other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998; Employees State Insurance Act, 1948; Employees State Insurance Central Rules, 1950; Employees State Insurance General Regulations, 1950; Contract Labour (Abolition and Regulation) Act, 1970.	15
III	Indian Boilers Act, 1923 with allied Regulations, 1961, Indian Electricity Act, 2003 and Rules, 1956; Indian Explosives Act, 1884 and Rules, 2008; Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996.	15

IV	Socio-economic Aspects: Social Accountability 8000 Standard. ILO - Introduction, Convention and Recommendation concerning Occupational Health & Safety. Welfare offers, Right & Obligation of workers.	15
	Total Contact Hours	60

Suggested Evaluation Methods			
Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**
• Class Participation:	5	Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. R.K. Jain and Sunil S. Rao, Industrial Safety , Health and Environment Management Systems, Khanna publishers , New Delhi (2006).
2. K.T. Narayanan, Safety, Health and Environment Handbook, McGraw Hill Education (2017).
3. P. Leelakrishnan, Environmental Law in India, Lexis Knowledge (2021).

Session: 2025-26			
Part A - Introduction			
Name of Programme	Post Graduate Diploma in Health, Safety and Environment		
Semester	II[nd] semester		
Name of the Course	**Legal and Socio-economic Aspects of Health, Safety and Environment - Part II**		
Course Code	P25-HST-203		
Course Type	CC-7		
Level of the course	400-499		
Pre-requisite for the course (if any)	Nil		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Acquire values and attitude towards various policies and constitutional framework governing environmental Protection in India. CLO 2: Understand management rules of different types of waste in India. CLO 3: Have in-depth knowledge of various legislations related to manage hazardous materials in India. CLO 4: Understand social welfare efforts in India.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	The Insecticides Act, 1968 and Rules, 1971; Atomic Energy (Radiation Protection) Rules, 2004; Static and Mobile Pressure Vessel (Unfired) Rules, 2016; The Environment (Protection) Act, 1986; EIA Notification, 2006.	15
II	The Water (Prevention and Control) Act, 1974; The Air (Prevention and Control of Pollution) Act, 1981; The Noise Pollution (Regulation and Control) Rules, 2000; Solid Waste (Management) Rules, 2016; e-waste (Management) Rules, 2022; Biomedical Waste (Management) Rules, 2016.	15
III	The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989; Gas Cylinders Rules, 2016; Calcium Carbide Rules, 1987; Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016.	15
IV	Welfare & Training: General Provision, Drinking Water, Sanitary & Washing, Cloakrooms, Facilities for Food & Drink, Shelters & Living Accommodation.	15
	Total Contact Hours	60

Suggested Evaluation Methods			
Internal Assessment: 30		**End Term Examination: 70**	
➢ **Theory**	**30**	➢ **Theory:**	**70**

• Class Participation:	5	Written Examination
• Seminar/presentation/assignment/quiz/class test etc.:	10	
• Mid-Term Exam:	15	

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. R.K. Jain and Sunil S. Rao, Industrial Safety , Health and Environment Management Systems, Khanna publishers , New Delhi (2006).
2. K.T. Narayanan, Safety, Health and Environment Handbook, McGraw Hill Education (2017).
3. P. Leelakrishnan, Environmental Law in India, Lexis Knowledge (2021).

Session: 2025-26			
Part A - Introduction			
Name of Programme	Post Graduate Diploma in Health, Safety and Environment		
Semester	II[nd] semester		
Name of the Course	Industrial and Occupational Hazard and Risk - Analysis and Management		
Course Code	P25-HST-204		
Course Type	CC-8		
Level of the course	400-499		
Pre-requisite for the course (if any)	Nil		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Identify, analyse and control hazard at workplace using various techniques. CLO 2: Identify, analyse and control risk at workplace and use of various risk analysis techniques. CLO 3: Review and learn from historical industrial and occupational accidents through various techniques. CLO 4: Identify and analyse various types of hazardous chemicals/substances during the transportation and study their safety precautions.		
Credits	Theory	Practical	Total
	4	0	4
Teaching Hours per week	4	0	4
Internal Assessment Marks	30	0	30
End Term Exam Marks	70	0	70
Max. Marks	100	0	100
Examination Time	3 hours		

Part B-Contents of the Course

Instructions for Paper- Setter: The examiner will set 9 questions asking two questions from each unit and one compulsory question by taking course learning outcomes (CLOs) into consideration. The compulsory question (Question No. 1) will consist at least 4 parts covering entire syllabus. The examinee will be required to attempt 5 questions, selecting one question from each unit and the compulsory question. All questions will carry equal marks.

Unit	Topics	Contact Hours
I	HAZARD and HAZOP: Introduction to Hazard, Causes, Identification, Evaluation & Control of Hazard. HAZOP Analysis, Sources for Information on Hazard Evaluation. Hazards in process of melting (furnaces), casing, and forging with example cases. Major chemical and radioactive disasters.	15
II	Study of Risk at work site and preparation and initiation of reports: Definition of Risk, Risk analysis. Introduction to Failure, Mode and Effect Analysis (FMEA) and Maximum Credible Accident Analysis (MCAA), Fault Tree Analysis (FTA), Event Tree Analysis (ETA) with example of each analysis technique.	15
III	Techniques for reviewing and learning major accidents: Management Oversight and Risk Tree (MORT), Incident Recall Technique (IRT), Critical Incident Review Technique (CIRT), Root cause analysis Technique (RCAT) with example of each technique.	15
IV	Risk Analysis Exercise: Chemical-Compatibility and Transportation: chemicals compatibility considerations, transportation of chemicals, toxic / flammable / explosive / radioactive substances by all modes – safety precautions. Use of	15

	material Safety Data Sheets.			
			Total Contact Hours	60
Suggested Evaluation Methods				
Internal Assessment: 30			**End Term Examination: 70**	
➢ **Theory**	**30**		➢ **Theory:**	**70**
• Class Participation:	5		Written Examination	
• Seminar/presentation/assignment/quiz/class test etc.:	10			
• Mid-Term Exam:	15			

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. Industrial Safety Management: Hazard Identification and Risk Control. L. M. Deshmukh. McGraw Hill.
2. Chemical Process Industry Safety. K. S. N. Raju. McGraw Hill.
3. Industrial Accident Prevention: A Safety Management Approach. H. W. Heinrich, D. Petersen, N. R. Roos. McGraw-Hill.

Session: 2025-26			
Part A–Introduction			
Name of the Programme	Post Graduate Diploma in Health, Safety and Environment		
Semester	IInd semester		
Name of the Course	Practical-III		
Course Code	P25-HST-205		
Course Type	PC-3		
Level of the course	400-499		
Pre-requisite for the course (if any)	NA		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Have knowledge of safety audit and emergency plan and accident control system in industries. CLO 2: Implement precautionary measures in industries using explosive materials in their operation. CLO 3: Equip students about the occupational health and safety (OHS) legislation. CLO 4: Have knowledge of the Government acts and rules meant to protect the employment and conditions of service and welfare of the workers.		
Credits	**Theory**	**Practical**	**Total**
	0	**4**	**4**
Teaching Hours per week	0	**8**	**8**
Internal Assessment Marks	0	**30**	**30**
End-Term Exam Marks	0	**70**	**70**
Max. Marks	0	**100**	**100**
Examination Time	4 hours		
Part B-Contents of the Course			
Practicals			**Contact Hours**

1. Carry out a plant safety inspection with the help of check list and prepare a safety audit report. 2. Study of fire risk management including fire emergency action plan in an industry. 3. Study of precautions in processes and operations of different explosives. 4. Study of BLEVE (Boiling liquids expanding vapour explosion) scenario- A case study. 5. Study of accident control system. 6. A National case study on a chemical accident. 7. Study of present state of occupational health and safety (OHS) legislation in India. 8. Study of a case to protect the employment and conditions of service of the building and other construction workers as per The Building and other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998 Act. 9. Study of a case for the welfare of the building and other construction workers as per The Building and other Construction Worker's Welfare Cess Act 1996 & Cess Rules 1998. 10. Compensation - fixation and payment to workers by industry as per Workmen's Compensation Act - A case study.	120

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Practicum**	**30**	➢ **Practicum**	**70**
• Class Participation:	5	Lab record, Viva-Voce, write-up and execution of the practical	
• Seminar/Demonstration/Viva-voce/Lab records etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. R.K. Jain and Sunil S. Rao, Industrial Safety, Health and Environment Management Systems, Khanna publishers , New Delhi (2006).

2. Industrial Safety Management: Hazard Identification and Risk Control. L. M. Deshmukh. McGraw Hill.

3. Industrial Accident Prevention: A Safety Management Approach. H. W. Heinrich, D. Petersen, N. R. Roos. McGraw-Hill.

Session: 2025-26			
Part A– Introduction			
Name of the Programme	Post Graduate Diploma in Health, Safety and Environment		
Semester	II[nd] semester		
Name of the Course	Practical-IV		
Course Code	P25-HST-206		
Course Type	PC-4		
Level of the course	400-499		
Pre-requisite for the course (if any)	NA		
Course Learning Outcomes (CLO) After completing this course, the learner will be able to:	CLO 1: Have knowledge about the different legislative Acts and Rules to prevent and control environmental pollution and waste management. CLO 2: Have knowledge about the different legislative Acts and Rules to prevent and control radiation and chemical hazard. CLO 3: Equip the students to conduct hazard analysis and modelling. CLO 4: Equip the students with different risk analysis methods.		
Credits	**Theory**	**Practical**	**Total**
	0	**4**	**4**
Teaching Hours per week	0	**8**	**8**
Internal Assessment Marks	0	**30**	**30**
End-Term Exam Marks	0	**70**	**70**
Max. Marks	0	**100**	**100**
Examination Time	4 hours		
Part B-Contents of the Course			
Practicals			**Contact Hours**

1. Study of a violation case of EIA Notification, 2006. 2. Study of stages of GRAP in Delhi-NCR. 3. Study of hazardous waste management in an industry. 4. Study of a case for the facilities for shelters & living accommodation for workers in an industry. 5. Study of biomedical waste management in a hospital. 6. Computer-aided hazard analysis and modelling. 7. Conduct a general risk assessment of a work place using matrix and prepare a report. 8. Implementing practical usages of safety equipments and accessories. 9. To prepare material safety data sheet for any particular hazardous substance. 10. To study potential errors or faults using FMEA.	120

Suggested Evaluation Methods

Internal Assessment: 30		**End Term Examination: 70**	
➢ **Practicum**	**30**	➢ **Practicum**	**70**
• Class Participation:	5	Lab record, Viva-Voce, write-up and execution of the practical	
• Seminar/Demonstration/Viva-voce/Lab records etc.:	10		
• Mid-Term Exam:	15		

Part C-Learning Resources

Recommended Books/e-resources/LMS:

1. P. Leelakrishnan. (2021). Environmental Law in India, Lexis Knowledge.

2. L. M. Deshmukh. (2014). Industrial Safety Management: Hazard Identification and Risk Control. McGraw Hill.

3. H. W. Heinrich, D. Petersen, N. R. Roos. (1980). Industrial Accident Prevention: A Safety Management Approach. McGraw-Hill.

Session: 2025-26	
Name of the Programme	Post Graduate Diploma in Health, Safety and Environment
Semester	II[nd] semester
Name of the Course	Internship
Course Code	P25-INT-200
Course Type: (CC/DEC/PC/Seminar/CHM/OEC/EEC)	Internship
Level of the course	400-499
Course Learning Outcomes (CLO). After completing this course, the learner will be able to:	CLO 1: Demonstrate a sound technical knowledge and research aptitude in the concerned subject/discipline. CLO 2: Improves his/her technical skills and enhances employability skills.
Credits	Internship
	4
Teaching Hours per week	
Max. Marks	100
Internal Assessment Marks	50
End Term Exam Marks	50
Examination Time	
Instructions for Examiner: Evaluation of the Internship will be done by the internal and external examiner on the parameters as decided by staff council of the department. There will be internal and external examination/viva-voce examination.	