



DIPLOMA IN HOSPITAL WASTE MANAGEMENT

Course Name: Diploma in Hospital Waste Management

Duration: 1 Year

Eligibility: Class 10 or equivalent from a recognized board

DETAILED SYLLABUS

Semester I	Semester II
Fundamentals of Environment and Health Care Waste Management Regulation-I	Fundamentals of Environment and Health Care Waste Management Regulation-II
Health Care Waste Management Concepts, Technologies and Training-I	Health Care Waste Management Concepts, Technologies and Training-II

SEMESTER I

PAPER 1: FUNDAMENTAL OF ENVIRONMENT AND HEALTH CARE WASTE MANAGEMENT REGULATION-I

CONTENT:

Unit 1: Introduction to Environment: What is Environment, You and Your Environment, Is there an Environmental Crisis?, Features of Our Environment, Our Unique Earth, The Biosphere, Ecosystem, Components of the Ecosystem, Production and Consumption, Food and Energy Flow, Trophic Level, Energy Flow, Food Chain, Food Web, Bio-magnification, Matter Cycles, Population and Community, Energy, The Sun and its Energy, Isolation Reaches Earth, Radiation from the Ground, Greenhouse Effect and Global Warming, Pollution and Pollutants.

Unit 2: Environmental Pollutants: Historical Development, Air Pollution, Types of Air Pollutants, Major Air Pollutants, Noise Pollution, Water Pollution, Types of Water Pollutants, Radiation Pollution, Anthropogenic Sources of Radiation, UV-Radiation, Global Issues, Greenhouse Effect, Global Warming, Ozone Hole, Acid Rain, Deforestation, Food Security.

Unit 3: Interrelationship of Environment and Health: Concept and Definition of Health, Dynamics of Development of Disease, Determinants of Health, Causation of Disease, Natural History of Disease, Environment and its Effect on Health, Environmental Health Hazards, Sources of Environmental Hazards, Effects of Hazards on Health, Prevention and Control of Hazards.

Unit 4: Waste Management: Waste Around Us, Definition and Identification, Classification of Wastes, Characterization of Wastes and its Importance, Principles of Waste Management, Collection and Segregation, Recycle, Recovery and Reuse, Transportation and Disposal, Waste Disposal versus Waste Management.

Unit 5: Definitions, Types and Categories of Waste: Definition of Waste, Municipal Waste, Health Care Waste, Sources of Health Care Waste, Types of Health Care Waste, Infectious and Non-infectious Waste, Hazardous Health Care Waste, Solid Health Care Waste and its Sources, Liquid Health Care Waste and its Sources, Biodegradable and Non-biodegradable Waste, Categories of Health Care Waste, Categories as Per World Health Organization, Categories as Per Gazette Notification of India, Categories as Per Thailand Authorities, Categories as Per Indonesian Authorities, Emerging Concepts of Categorization in South East Asian Countries.

Suggested Readings

1. http://www.who.int/water_sanitation_health/medicalwaste/en/guidancemanual1.pdf
2. <http://geolibrary.org/library/default.aspx?CategoryID=266>

PAPER 2: HEALTH CARE WASTE MANAGEMENT CONCEPTS, TECHNOLOGIES AND TRAINING-I

CONTENT:

- Unit 1:** Managerial and Administrative Aspects: Management Tools, Systems Approach, Sources of Health Care Waste, Importance of Training, Evaluating the System, Administrative Aspects, Infection Control Committee, Health Care Waste Management Committee, Conjoint Action, Key Persons in Health Care Waste Management, Waste Handlers: An Important Group, Waste Audit.
- Unit 2:** Integrated Infection Control Management: Infection in Hospitals, Sources of Infection, Types of Microbial Agents in Hospital, Hospital Acquired Infection, Susceptible Groups, Principles of Infection Control, Hospital Infection Control Guidance Care for Patients with Probable SARS, Infection Control Precautions in Different Areas within the Health Care Facility, Operation Theatre, Wards, Laboratories, Blood Banks, Precautions while Handling Sharps, Precautions in Transportation, Precautions while Handling Spillage and Gas Waste, Accident Reporting, Post Exposure Prophylaxis, Safety Measures for Waste Handlers, Principles, Safety Clothing and Protective Gear.
- Unit 3:** Disinfection and Transportation: Disinfection and Mutilation, Disinfection and Mutilation, Principles of Disinfection, Types of Disinfection Agents, Mechanical Processes: Shredding and Mutilation, Storage and Transportation, Storage: Time and Principles, and Climatic Effects, Transportation of the Waste, Specificity of Transport Vehicles, Exclusive Transports, Hazardous Signposting, Record Keeping and Reporting, Accident Reporting System.
- Unit 4:** Capacity Building, Training and Monitoring: Improving Awareness, Health Care Waste Management as a Subject, Training, Training Tools, Training Different Health Care Providers, Accreditation of Health Care Establishments, Role of International Agencies, WHO, Other UN Agencies, Role of Non-Government Organizations, Funding and Budgeting of Health Care Waste Management System, Monitoring, System Monitoring, Day-to-Day Monitoring, Periodic Monitoring, Waste Performance, Sign Posting, Record Keeping, Tracking Policies.
- Unit 5:** Systems Options: Sub-system (Objectives and Components) of a Waste Management System, Objectives of a Waste Management System, Components of a Waste Management System, Planning a Waste Management System, On-site Management, Off-site Management, Options Available for a Waste Management System, Single Option versus Multi Option Approach, Waste Management as a Systems Option.
- Unit 6:** Treatment and Disposal of Health Care Waste Burn Technology: Open Burning, Principles of Incineration, Waste Characteristics for Incineration, Types of Incinerators, Small Scale Incineration, Emission Standards for Small Scale Incinerators, Single Chamber Incinerators, Double Chamber Incinerators, Pyrolytic Incinerators/Controlled Air Incinerators, Rotary Kiln Incinerators, Air Pollution

Control Unit, Flue Gases, Scrubbers, Formation of Dioxins: Burning of Plastics, Emission of Other Gases from Incinerators., Cost of Treatment, Plasma , Pyrolysis, Workers Safety.

Suggested Readings

1. Hospital Waste Management and Its Monitoring Sanskriti Sharma, Jaypee Brothers Publishers, 2002
2. http://www.iswa.org/uploads/tx_iswaknowledgebase/Townend.pdf

SEMESTER II

PAPER 1: FUNDAMENTAL OF ENVIRONMENT AND HEALTH CARE WASTE MANAGEMENT REGULATION-II

CONTENT:

- Unit 1:** Principles of Health Care Waste Management: General Principles of Waste Management, Do No Harm, Disposables versus Durables (Non-disposables), Reduce, Recycle, Reuse and Recover, Flow of Bio-medical Waste (Life Cycle Approach), Principles of Managing Different Categories of Waste, Principles of Managing Sharps, Chemical Disinfectants, Waste from Dental Clinics, Waste from Laboratories and Blood Banks, Waste from Other Patient Care Areas, Radioactive Waste, Expired Pharmaceuticals, Attenuated Vaccines, Principles of Accident Reporting, Occupational Hazards Due to Health Care Waste, Principles of Segregation, Collection, Transportation and Disposal of Health Care and Waste.
- Unit 2:** Handling Health Care: WASTE- Source Identification, Segregation, Collection, Transportation and Disposal, Segregated Collection, Storage, Transportation Chain, Final Treatment and Disposal Including Secured Landfill, Management of Metallic Waste, Management of Chemical Waste, Management of Certain Specialized Waste, Pharmaceutical Waste, Cytotoxic Waste, Radioactive Waste and Pressurized Containers.
- Unit 3:** Impact of Health Care Waste On Our Environment: Chemicals in Health Care Waste, Case Study, Mercury, Lead, Cadmium, Chromium, Disinfectants, Gaseous Pollutants, Impact on Environment, Effect on Atmosphere, Impact on Food and Livestock, Impact on Water and Aquifer and Impact on Marine Ecosystem.
- Unit 4:** Impact of Health Care Waste on Human Health: Effects of Physical Pollutants, Environmental and Health Risk Associated with Medical Waste, Effects of Chemical Pollutants, Effects of Biological Pollutants, Effects of Radiological Pollutants, Sources of Infectious Agents in Health Care Waste, Infectious Waste Categories, Various Organisms in Health Care Waste, Proliferation and Desiccation, Hospital Acquired Infection, High-risk Areas and Risk Groups, Health Care Waste, Susceptibility, Risk and Impact of Health Care Waste on Health Providers, Risk Susceptibility from Hospital Waste, Categories of the Persons Exposed to Risk of Infections, Risks Associated with Infectious Wastes.
- Unit 5:** Survey Methodology Worker Safety and Precautions: Survey Methodology, Principles of Survey, Component Analysis, Survey Reports—India and Other Countries of South East Asia, Survey Periods, Safety and Precautions, Principles of Safe Handling, Occupational Safety, Safety Precautions for Doctors, Nurses, Paramedical and Waste Handlers.

Suggested Readings

1. http://www.who.int/water_sanitation_health/medicalwaste/en/guidancemanual1.pdf
2. <http://geolibrary.org/library/default.aspx?CategoryID=266>

PAPER 2: HEALTH CARE WASTE MANAGEMENT CONCEPTS, TECHNOLOGIES AND TRAINING-II

CONTENT:

- Unit 1:** Treatment and Disposal of Health Care Waste- Non- Burn Technologies: The Need for Non-Incineration Health Care Waste Technologies, Non-Burn Technologies, Microwave, Wet Thermal Treatment, Dry Thermal Treatment, Chemical Based Technologies, Other Technologies, Select an Appropriate Technology.
- Unit 2:** Innovate Concepts and Possibilities: Solar Energy and Waste Management, Stored Chemical Energy in the Waste, other Emerging Concepts for Health Care Waste Management, Mobile Hospital Waste Management System, Sustainable Hospitals, Waste to Energy Concept.
- Unit 3:** Managing Waste Water from Health Care Facilities: Characteristics and Hazards of Waste Water from Health Care Facilities, Waste Water Management, Connection to a Municipal Sewage Treatment Plant, On-site Treatment of Waste Water, Minimal Waste Water Treatment Systems, Lagooning, Minimal Safety Requirements, Sanitation, Introduction, Hospital Water Consumption Pattern, Establishing of Effluent Treatment.
- Unit 4:** Management of Wastes From Immunization: Managing Waste from Immunizations, Magnitude of the Problem, Need for Managing Waste from Immunizations, Indian Regulations Regarding Waste Disposal Treatment, Technology Options for Safe Management of Waste, Technologies Used at the Point of Generation, Portable Steam Treatment Unit and Traditional Grinder, Technologies Used for Final Disposal, Centralized Bio-medical Waste Treatment Systems, Comparison of Various Methods for Processing/Disposal of Immunization Waste, Case Studies of Successful Non-burn immunization Waste Management Systems, Himalayan Institute Hospital Trust, Dehradun, Uttaranchal, India, Program for Appropriate Technology in Health (PATH): Partnership Project with, Government of Andhra Pradesh, India, Philippines Measles Elimination campaign.
- Unit 5:** Occupation and Patient Safety: Occupational Risks to Waste Workers, General Risks of Health Care Waste, Risk of Incineration of Health Care Waste, Risks Beyond the Health Care Settings or "Downstream" Risks, Health and Injury Issues, Environmental Health and Injury Issues, Steps for Improving Occupational Safety, Developing Hospital Safety and Health Programmes, Guidance and Policy, General Guidance and Policy, Specific Guidance and Policy, Patient Safety, World Alliance for Patient Safety, Model Injection Centre (MIC).
- Unit 6:** Training Manual for Waste Handler on Health Care Waste Management: Training Objectives and Methodology, Lessons, Attitudinal Change a concept of Clean and Unclean Practices, Waste and its Kinds, Hazards of Waste, Preventing Infections, Hand Washing, Use of Gloves, Segregation, Infectious Waste Management,

Collection and Storage, Transportation within the Health Care Setting, Management of Sharps, Management of Metal Sharps, Management of Glass Sharps, Management of Plastics, Management of Liquid Waste, Use of Disinfectants, Management of Soiled Linens, House Keeping, Record Keeping, Duties of Employees.

Suggested Readings

1. Hospital Waste Management and Its Monitoring Sanskriti Sharma, Jaypee Brothers Publishers, 2002
2. http://www.iswa.org/uploads/tx_iswaknowledgebase/Townend.pdf