

**Ministry of External Affairs
DPA II Division**

ITEC COURSE PROPOSAL SUMMARY
(duly filled form to be scanned and sent as scanned pdf by email)

1. Administrative details

Course Title	Solid Waste Management (SWM)		
Stream	Environment and Climate Change		
ITEC Coordinator/ Course Director	Dr. J. Rajeswar , Training Coordinator, EPTRI		
Course Duration:	from <u>20th August – 02nd September, 2024</u> ; <u>2</u> weeks		
No. of days of training	<u>14</u> days =	<u>90</u> learning hrs (approximate)	
Accommodation	Type: <u>Hostel</u>	Distance from Campus	<u>within campus</u>
	Name of Hostel: <u>EPTRI Executive Hostel</u>		
Airport (nearest)	Location:	Hyderabad	Distance from campus/ accommodation 33 kms
Batch Size	Minimum participation =	30	Maximum participation = 35
Study tour	Type of visit	Places to visit (with location)	No. of days
	Educational	1. Hyderabad Integrated Municipal Solid Waste Management 2. Treatment Storage and Disposal Facility (TSDf)/ Municipal Corporation: Siddipet	2
	Cultural/ Heritage	Salarjung Museum, Charminar, Chowmallah Palace, Seven Tombs, Hussain Sagar	2

2. Financial proposal

S. No.	Fee component	Unit	Per participant cost	Total Cost for all participants
1	Course Fee	per week per participant	6000	420000
2	Study tour charges	per participant	8500	297500
3	Other charges (for Project, lab analysis etc.)	per participant	35000	1225000
4	Accommodation charges (inclusive of taxes) – Hostel	per day/night per participant	1500	735000
5	Airport pick-up and drop charges (inclusive of taxes) – for both ways	per participant	3000	105000
6	Living allowance	per day per participant	1500	735000
7	Book allowance	per participant	5000	175000
8	Valedictory/ inaugural allowance	per participant	300	10500
Course Duration (in weeks)		2 weeks	Total estimated expenditure	3703000
Participants (maximum)		35		

Rate of Living Allowance if fixed under guidelines (@ Rs. 1,500/- per day for up to 12-week long course and @ Rs. 1,200/- per day for courses of longer duration). Ceiling on Book Allowance and Valedictory/ inaugural allowance is also fixed @ Rs. 5,000/- per participant and @ Rs. 300/- per participant respectively.

'Lump-sum' fees for online component if any, along with number of learning hours	N/A
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3. Training Schedule: A simple thematic/ day-wise schedule (topics covered) may be attached.

Schedule will be prepared subsequently

Submitted by:
(sign and stamp of appropriate authority of the Institution)

COURSE DETAILS

A. Name of the Institute	Environment Protection Training and Research Institute (EPTRI), Hyderabad, Telangana, India
B. Name/Title of the Course	Solid Waste Management (SWM)
C. Course Dates with Duration in Weeks	From 20 th August – 02 nd September, 2024 In weeks: Two (2) weeks
D. Eligibility Criteria for Participants 1. Educational Qualifications 2. Work Experience required, if any 3. Age Limit 4. Target Group	Bachelor's / Master Degree in Social Science/Science, Diploma or Bachelor's Degree in Engineering Minimum 2 years in relevant area 25-45 years Junior, Middle, SeniorLevel- Environment Ministry, Municipal Bodies, Rural/Urban Local Bodies, Industry Department, Academicians, Environment Regulatory Authorities.
E. Aims & Objectives of the Course	This course provides an overview of the Solid Waste Management situation in developing countries. It covers key elements of waste management systems, with their technical, environmental, social, financial and institutional aspects while covering strategic planning and policy issues.
F. Course Contents / Syllabus	Course content overleaf
G. Mode of Evaluation of performance of the participants	<ol style="list-style-type: none">1. During the course, questions will be posed to the participants.2. Participants will be requested to recap the previous day program.3. Participants will make presentation on existing and future of action in their respective organizations. This exercise will provide a chance to the participants to think through what they have learnt, new things they can adopt.

Solid Waste Management – Course Content

About the course:

This course covers key elements of the waste management system, with its technical, environmental, social, financial and institutional aspects. Besides understanding the challenges, the participants will study about appropriate and already applied solutions through selected case studies. This course also covers strategic planning and policy issues discussing the future visions for waste management and aspects of circular¹ and green² economy. Considering the importance of organic waste, the course also covers several aspects of organic waste treatment technology options such as composting, anaerobic digestion and some other innovative approaches and technologies.

This course is designed keeping in line with the framework as suggested by the World Bank Institute.

Course Contents

Module – I Overview of Solid Waste Management

1. Introduction
2. Understanding SWM
 - a. What is Solid Waste?
 - b. Solid Waste Management
 - c. Sustainable source separation of Waste: Panaji, India
 - d. MSW
 - e. Types of MSW
3. Some Core Concepts
 - a. 3Rs of WM
 - b. Waste hierarchy
 - c. Feasibility of the 3Rs
 - d. ISWM
 - e. Circular Economy
4. Waste Quantities, types and projections
 - a. Importance of MSW data
 - b. Perspective for reviewing MSW data
 - c. MSW data generation
 - d. MSW composition
 - e. MSW collection
 - f. Global MSW treatment and disposal
 - g. Waste generation, GDP, and urbanization
 - h. Decoupling Waste generation and GDP
5. Impacts of SW on Environment and Climate Change
 - a. Effects of SWM
 - b. Positive effects of proper SWM
 - c. How SW contributes to Climate Change
 - d. Impacts of Climate change on SWM
 - e. GHG emissions and reductions along the SWM chain
 - f. Sustainable Development Goals (SDG's)

¹ Circular economy is a generic term for an industrial economy that is, by design or intention, restorative and in which material flows are of two types, biological nutrients, designed to re-enter the biosphere safely, and technical nutrients, which are designed to circulate at high quality without entering the biosphere.

² Economy that generates increasing prosperity while maintaining the natural systems that sustain us. European Environment Agency

6. Solid Waste in the World's Oceans
 - a. SW in the World's Oceans
 - b. Microplastics
 - c. What's your take?
 - d. Example of Singapore's MSW system

Module – II Solid Waste Management Chain – Part-1

1. Introduction
 - a. A way in Waste
2. The SWM chain
 - a. The SWM chain
 - b. Costs along the SWM chain
 - c. Singapore's MSW system
3. Source segregating Waste
 - a. Waste segregation
 - b. Sources of MSW
 - c. Properties of MSW
 - d. Important considerations to keep in mind
 - e. Waste reduction strategies
 - f. Source segregation
 - g. Challenges in Waste segregation
4. Collecting MSW
 - a. What's your take?
 - b. Basic principles of Waste collection
 - c. Types of Waste collection
 - d. Pneumatic Waste collection
5. Transporting collected Waste
 - a. Transportation is dependent of Waste collection
 - b. What's your take?
6. Use of Transfer stations
 - a. What's your take?
 - b. Location of transfer stations
 - c. Materials recovery facilities (MRFs)
 - d. Benefits of Transfer stations

Module – III Solid Waste Management Chain – Part-2

1. Introduction
2. Recycling
 - a. Changing trends of consumption in developing countries
 - b. Countries recycling waste
 - c. Some statistics and pointers about recycling
 - d. Benefits of recycling
 - e. Recycling plastic in developing countries
 - f. Recycling materials
 - g. Recycling Process: Plastics
 - h. Recycling process: Aluminum
 - i. Recycling process: Glass
 - j. Recycling process: Paper
 - k. Challenges in Recycling

3. Treating Organic waste
 - a. Methods to treat organic waste
 - b. Composting
 - c. Composting process
 - d. Composting using insects
 - e. Anaerobic digestion
 - f. Mechanical Biological Treatment (MBT) facilities
4. Thermal Treatment of Waste
 - a. Using Waste to generate Energy
 - b. Waste-to-Energy (WTE) or incineration (Mass burn)
 - c. WTE and the Environment
 - d. Refuse derived Fuel (RDF)
 - e. Solid recovered fuel (SRF)
 - f. Advanced thermal treatment
5. Disposal
 - a. Disposal options
 - b. Comparison of disposal options
 - c. Siting landfills
 - d. EIA – Site selection
 - e. Landfill gas (LFG) capture and use
 - f. Landfill closure and monitoring

Module – IV Financial Aspects of SWM

1. Introduction
2. Costs of SWM
 - a. Basic principles of SWM financing
 - b. Market and policy drivers along SWM chain
 - c. Determining cost of a SW service
 - d. Obtaining Investment funding
 - e. Investments in SWM
 - f. Investments in SWM: challenges
 - g. Operation and Maintenance (O&M) costs
 - h. Obtaining O&M funding
 - i. Capital, operating and maintenance costs of SWM
 - j. Costs of Inaction: What's your take?
 - k. Important cost considerations
3. Cost recovery
 - a. Financial sustainability of SWM systems
 - b. Ways to improve financial sustainability of SWM: Cost recovery
 - c. Cost recovery mechanisms explained
 - d. Success of volume-based waste fees in the Republic of Korea
 - e. Ways to improve financial sustainability of SWM: Economic instruments
 - f. Economic instruments: product take back – Extended Producer Responsibility(EPR)
 - g. Economic instruments: product take back – Deposit refund system
 - h. Types of Economic instruments: Taxes
 - i. Economic instruments: incentives-feed-in tariffs
4. Private sector involvement
 - a. Involvement of private sector in SWM
 - b. Public-private partnerships (PPP)
 - c. PPP worldwide

- d. Examples of PPP in MSW treatment: WENZHOU, CHINA

Module – V Policies, Institutions and the Informal Sector

1. Introduction
2. SWM policies
 - a. Governance and SWM policies
 - b. Policies, Institutions, Stakeholders and the SWM sector
 - c. Policy Instruments
 - d. SW policies and laws
 - e. International SW policies and laws
 - f. Regional SW policies and laws
 - g. EU Landfill Directive, 1999
 - h. Role of National and Local Governments
 - i. Importance of SW planning
3. SWM Institutions
 - a. Institutional roles
 - b. Who are the Stakeholders?
 - c. Institutions
 - d. Inter-municipal Government cooperation
 - e. Poor institutional capacity
 - f. Challenges in developing countries
4. Upgrading the SWM sector
 - a. Overview of a Roadmap for reform
 - b. The Roadmap for reform
5. The Informal sector
 - a. What is informal sector?
 - b. Recycling by the informal sector
 - c. Where are waste pickers found?
 - d. Waste recovery by the informal sector
 - e. Pricing of recyclables collected by waste pickers
 - f. Importance of the informal sector
 - g. Why do local governments hesitate to work with the informal sector?
 - h. Why should the informal sector be recognized?
 - i. How to integrate the informal waste sector?

Module – VI Circular Economy and Innovations in the SWM sector

1. Introduction
2. Circular economy
 - a. Definition of circular economy
 - b. What is circular economy?
 - c. Principles of circular economy
 - d. Circular economy schools of thought
 - e. Use of circular economy
 - f. How is circular economy used in different economies?
3. Innovations in the SWM sector
 - a. Introduction to Design Thinking
 - b. Innovation in the SWM sector
 - c. Innovative ideas: 3R's
 - d. Recycling ideas: 3R's

- e. Innovative ideas: collection and transport
- f. Innovative ideas: treatment and disposal
- g. Innovations: using alternate materials
- h. Innovations: citizen engagement and education
- i. Use of Apps in SWM
- j. Augmented reality in SWM
- k. Innovations: Clean city awards
- l. Other innovations
- m. Preparation for the Face-to-face technical exchange on SWM in Seoul, Korea

Module - VII

- 1. Introduction to Bio-Medical Waste Management
- 2. Introduction to Plastic Waste Management
- 3. Introduction to Construction & Demolition Waste Management

Module – VIII – Sustainable Development Goals (SDG's)

Module - IX – Design Thinking for Social Innovation