

Digital Learning Content on Non-Sewered Sanitation

OCTOBER 2021

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INTRODUCTION

The Swachh Bharat Mission (SBM) was launched in 2014 to eradicate open defecation across India, by increasing access to toilets. This has led to many towns and cities being certified Open Defecation Free (ODF) with many going beyond ODF status in recent times. However, with a majority of the population lacking access to a sewerage network, the remaining links in the sanitation service chain, including conveyance, and treatment and reuse of treated waste, remained to be addressed, and are the focus of the extended SBM 2.0 starting from 2021.

The National Policy on Faecal Sludge and Septage Management (FSSM), 2017, combined with the government's priorities through SBM 2.0, has led to an increased acceptance and adoption of Non-Sewered Sanitation systems including faecal sludge and septage management (FSSM) and decentralized wastewater management across India. However, to achieve stated goals under SBM 2.0, capacity building of officials is vital as there exists a large capacity gap across various levels of government officials in the sanitation sector.

The Sanitation Capacity Building Platform (SCBP) at the National Institute of Urban Affairs (NIUA) was formed in 2016, supported by a grant from the Bill and Melinda Gates Foundation (BMGF), to fill this gap through the development and delivery of capacity building programs in Non-Sewered Sanitation, with a focus on FSSM. Since its inception, SCBP has developed a range of training modules aimed at different target audiences, drawing from the learnings from different state and city approaches, to further the goals of the Government of India, in line with the Sustainable Development Goals 2030 (SDGs).

SCBP at NIUA is entrusted with the responsibility for anchoring the capacity development activities for FSSM under the National Faecal Sludge and Septage Management Alliance's Training Module Review Committee (TMRC), under which eight modules covering various aspects of NSS have been covered. Further, a strategy for digital dissemination of these modules was conceived, based on the SCBP's Normative Framework on Capacity Building, learnings from pilot training held in the development of the above modules, combined with experiences from training programs held online by Alliance partners. The e-courses will be made available on the National Urban Learning Platform (NULP), and also uploaded on the Integrated Government Online Platform (iGOT), set up under Mission Karmayogi of the Government of India.

SCBP developed the following modules, seven of them are currently in the process of being digitised and converted to e-courses (details in the latter section of the document):

1. Orientation on FSSM
2. Technology and Financing Options for FSSM
3. Integrated Wastewater and Septage Management – Planning
4. Integrated Wastewater and Septage Management – Design
5. Planning for FSSM
6. Designing of Faecal Sludge Treatment Systems
7. Co-treatment of Faecal Sludge and Septage with Sewage in Sewage Treatment Plant
8. Financing and Contracting Options for FSSM

Modules under TMRC	Target Audience as per Normative Framework	Digital Content	Channels of Delivery and Platforms
<p>Orientation:</p> <ul style="list-style-type: none"> FSSM <p>Specialized:</p> <ul style="list-style-type: none"> Technology and Financing Options IWSM - Planning <p>Advanced:</p> <ul style="list-style-type: none"> FSSM - Planning IWSM - Design FSTP Design Co-treatment Financing and Contract Management 	<p>ULB officials Decision-makers at ULB-level Mid- and senior-level state officials Faculties from Nodal Training Institutes Consultants working with TSU/PMU/sector partners Academia: Faculty and students</p>	<p>Orientation: Training series Short e-courses</p> <p>Specialized:</p> <ul style="list-style-type: none"> Blended training/ training series Short e-courses Gamification <p>Advanced:</p> <ul style="list-style-type: none"> Training series Longer duration advanced ToT E-courses (upto 10hrs) Self-learning courses (upto 3hrs) 	<p>Channels:</p> <ul style="list-style-type: none"> Academia Alliance Partners Nodal Training Institutes <p>Delivery Platforms:</p> <ul style="list-style-type: none"> Partner LMS and other delivery platforms NULP by MoHUA iGoT by Gol

These modules have been classified into three levels - Orientation, Specialized and Advanced. Each can be delivered in various modes, including training of trainers (ToT), training series, e-courses (upto 10hrs), self-learning courses (upto 3hrs), and gamification methods. Each mode caters to a specific set of audiences, based on which the content and structure of the course have been updated. All these e-courses are based on the modules developed by SCBP under TMRC which are available on the NIUA website <https://www.niua.org/scbp/>

The E-courses under development follow the content framework under iGOT, which includes a WTDET cycle, each testing the participants' knowledge and skill on the course content. All SCBP courses will include all five components, each designed specifically for the content of the course. This will help understand the change incompetency of the participants after the training is complete, thus achieving the aims of Mission Karamyogi.

Components of iGOT Content Framework



Source: iGOT Content Framework, Department for Personnel and Training, Gol



Faecal Sludge and Septage Management

FSSM TECHNOLOGY AND FINANCING MODULE

The course comprises content developed by NIUA, New Delhi, in partnership with Ecosan Services Foundation, Pune, All India Institute of Local Self Government, Mumbai and CWAS, CEPT University, Ahmedabad with the support from the Training Modules Review Committee (TMRC) of the National Faecal Sludge and Septage Management Alliance (NFSSMA). The course is based on the module endorsed by the Ministry of Housing and Urban Affairs (MoHUA).

The module is split into the following parts: [Presentation slides](#) and [Learning notes](#).

Title	Faecal Sludge and Septage Management (FSSM) Technology and Financing Module
Purpose	<p>Through the course, participants will understand city-level sanitation and prepare an action plan for implementing safe and effective Faecal Sludge and Septage Management (FSSM). Participants will be introduced to gender challenges in sanitation, including the impact of inadequate sanitation on women and girls.</p> <p>With the extension of AMRUT, the announcement of SBM-U 2.0 and the recommendations of the 15th Finance Commission, this course provides a foundation for the target audience group to gain an understanding of FSSM, which is a key component in these national missions.</p>
Learning Objectives	<ul style="list-style-type: none">• Understand the FSSM service chain and its challenges• Learn about underlying principles of wastewater and septage generation, treatment, a snapshot of technological interventions under each component of the FSSM service chain• Prepare a city-level action plan for FSSM, including quantification of septage generation and the financial viability of regular desludging, applicability and viability of technologies
Target Audience	The program is curated for state-level officials and officials from Urban Local Bodies, including executive officers, junior and mid-level engineers, sanitary inspectors, and SBM and AMRUT nodal officers.
Format	The course is divided into 5 sessions of 60 mins each in a self-paced format, consisting of an online session combined with reflection quiz and assessment exercises. The course also includes additional learning material and case study handouts/videos, apart from the session videos. This will help the participants to apply knowledge gained during the course in real world scenario(s).
Certification	Participants who complete all sessions & activities at the end of each session would be eligible for certification.

Structure of the E-course on Technology and Financing on FSSM

Session		Topic	Contents	Mode	Duration	
1	1	Urbanization and Sanitation	<ul style="list-style-type: none"> • Sanitation Infrastructure in Urban India • Emerging Recognition of Faecal Sludge and Septage Management • Sanitation Value Chain • Faecal Sludge and Septage • Need for Faecal Sludge and Septage Management • Septage Management and Sewerage Systems • Approach to Septage Management in Cities 	Presentation video	40 min	50 min
	Case Study Video			Video	10 min	
	Quiz			Online Quiz	Self-paced	
2	2a	Understanding the existing situation and challenges	Understanding Sanitation Systems	Presentation video	20 min	30 min
	2b		Shit Flow Diagram Illustration	Video	10 min	
	Quiz			Online Quiz	Self-paced	
3	3a	Role of Stakeholders in FSSM Planning Process	<ul style="list-style-type: none"> • Identification of stakeholders • Characterisation of stakeholders 	Presentation video	10 min	60 min
	3b	Planning for Emptying Services	<ul style="list-style-type: none"> • Current Status of Emptying Services • Need for Periodic Cleaning of Septic Tanks • Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013 • Technologies for Desludging • Parameters for Assessing Conveyance Options • Demand Based Desludging • Schedule Based Desludging • Private Sector Participation 	Presentation video	40 min	
	Case Study Video			Video	10 min	
	Quiz			Online Quiz	Self-paced	

4	4	Technology Options for Containment, Conveyance and Treatment of Septage	<ul style="list-style-type: none"> • Technology Options for Containment • Technology Options for Conveyance • Technology Options for Treatment • Selection Criteria for Technology • Treatment Technologies 	Presentation video	50 min	60 min
	Case Study Video			Video	10 min	
	Quiz			Online Quiz	Self-paced	
5	5a	Financing and Contracting Options	<ul style="list-style-type: none"> • Identification of Potential Sources • Potential Revenue Structure • Financing Models 	Presentation Video	40 min	50 min
	5b		Calculation of O&M for conveyance and treatment	Presentation Video	10 min	
	Quiz			Online Quiz	Self-paced	

DESIGNING OF FAECAL SLUDGE TREATMENT SYSTEMS

The course comprises content developed by NIUA, New Delhi, in partnership with Ecosan Services Foundation, Pune, with the support from the Training Modules Review Committee (TMRC) of the National Faecal Sludge and Septage Management Alliance (NFSSMA). The course is based on the module endorsed by the Ministry of Housing and Urban Affairs (MoHUA).

The module is split into the following parts: [Presentation slides](#), [Learning notes](#), and [Workbook](#).

A) E-course on Designing of Faecal Sludge Treatment Systems

Title	Faecal Sludge and Septage Treatment – Design Module
Purpose	<p>This course is designed to give the participants a detailed understanding of designing a Faecal Sludge and Septage (FSS) treatment system/plant, including conveyance and financial considerations.</p> <p>With the launch of SBM-U 2.0 and AMRUT 2.0 and the recommendations of the 15th Finance Commission, this course provides participants a detailed understanding of implementing FSSM, which is a key component in these national missions.</p>
Learning Objectives	<ul style="list-style-type: none"> • Understanding characteristics and methods of quantifying faecal sludge and septage (FSS) • Financial viability and planning of regular desludging of on-site sanitation systems such as septic tanks, at town level • Understand the FSS treatment principles, for mechanized and non-mechanized treatment technologies in different contexts/geographies. • Develop a know-how of different design aspects such as treatment technologies, siting and layout planning, and operation and maintenance of a treatment plant
Target Audience	Professionals, consultants and PMUs of missions, experts, practitioners and government officials having an engineering background and professional experience in wastewater and septage management
Format	The course is divided into 7 sessions of 45-60 mins each in a self-paced format, consisting of an online session combined with reflection quiz and assessment exercises. The course also includes additional learning material and case study handouts/videos, apart from the session videos. This will help the participants to apply knowledge gained during the course in real world scenario(s).
Certification	Participants who complete all sessions & activities at the end of each session would be eligible for certification.

B) Self-learning course on Designing of Faecal Sludge Treatment Systems

Title	Faecal Sludge and Septage Treatment – Design Module
Purpose	<p>This course is designed to give the participants a detailed understanding of pre-requisite for designing and operationalisation of Faecal Sludge and Septage (FSS) treatment system/plant, including conveyance and financial considerations.</p> <p>With the launch of SBM-U 2.0 and AMRUT 2.0 and the recommendations of the 15th Finance Commission, this course provides participants a detailed understanding of implementing FSTP (STP-cum-FSTP) which is a key component in these national missions.</p>

Learning Objectives	<ul style="list-style-type: none"> Understanding characteristics and methods of quantifying faecal sludge and septage (FSS) Financial viability and planning of regular desludging of on-site sanitation systems such as septic tanks, at town level Understand the FSS treatment principles, for mechanized and non-mechanized treatment technologies in different contexts/geographies. Develop a know-how of different design aspects such as treatment technologies, siting and layout planning, and operation and maintenance of a treatment plant
Target Audience	Professionals, consultants and PMUs of missions, experts, practitioners and government officials having an engineering background and professional experience in wastewater and septage management
Format	The course is divided into 5 sessions of 2.5-3 hours in a self-paced format, consisting of an online session combined with reflection quiz and assessment exercises. The course also includes additional learning material and case study handouts/videos, apart from the session videos. This will help the participants to apply knowledge gained during the course in real world scenario(s).
Certification	Participants who complete all sessions & activities at the end of each session would be eligible for certification.

Structure of E-course on Designing of Faecal Sludge Treatment Systems

Session	Topic	Contents	Mode	Duration	
1	1a	<ul style="list-style-type: none"> Sanitation System Approach Wet Sanitation Systems Sanitation Value Chain Challenges in Sanitation Service 	Presentation video	25 min	
	1b	<ul style="list-style-type: none"> Parameters for characterizing Categories of sludge Operational factors affecting the characteristics 	Presentation video	25 min	
	Quiz			Online Quiz	Self-paced
2	2a	<ul style="list-style-type: none"> Need of quantification of sludge Methods of quantification of sludge Operational factors to be considered while quantification 	Presentation video	30 min	
	2b	<ul style="list-style-type: none"> Types of desludging methodologies Technical options for emptying and conveyance Optimising emptying and conveyance 	Presentation video	20 min	
	Case Study Video			Video	10 min
	Quiz			Online Quiz	Self-paced

3	3a	Treatment of Faecal Sludge and Septage	<ul style="list-style-type: none"> • Treatment targets and specific objectives • Approaches for faecal sludge and septage management • Treatment mechanisms • Driving factors for selection of treatment mechanisms 	Presentation video	35 min	80 min
	3b	Septage Receiving Station	<ul style="list-style-type: none"> • Objectives and design of septage receiving station • Components of septage receiving station • Type of septage receiving station 	Presentation video	35 min	
	Case Study Video			Video	10 min	
	Quiz			Online Quiz	Self-paced	
4	4	Non-mechanized Treatment Units of Faecal Sludge and Septage & its Design	<ul style="list-style-type: none"> • Stages of treatment of faecal sludge and septage • Non-mechanized treatment units • Designing of Settling Thickening Tank, Anaerobic Digester and Unplanted Drying Beds 	Presentation video	45 min	55 min
	Case Study Video			Video	10 min	
	Quiz			Online Quiz	Self-paced	
5	5	Mechanized Treatment of Faecal Sludge and Septage	<ul style="list-style-type: none"> • Stages of treatment of faecal sludge and septage • Mechanized treatment units • Selection of Dewatering technology, Drying technology and Thermal treatment 	Presentation video	45 min	60 min
	Case Study Video			Video	15 min	
	Quiz			Online Quiz	Self-paced	
6	6a	Financial aspects of FSSM	<ul style="list-style-type: none"> • Financial components of FSSM • Financial and contracting models 	Presentation video	25 min	60 min
	6b	Siting and Layout Planning of Treatment Plant	<ul style="list-style-type: none"> • Site characterisation and evaluation • Site selection criteria • Safety planning at treatment plant • Importance of layout planning and examples 	Presentation video	25 min	
	Case Study Video			Video	10 min	
	Quiz			Online Quiz	Self-paced	
7	7a	Construction and commissioning of Treatment Plant	<ul style="list-style-type: none"> • Pre - construction activities • During construction activities • Stages in commissioning of plant • Handover process of the plant 	Presentation video	30 min	60 min
	7b	Operation and Maintenance of Treatment Plant	<ul style="list-style-type: none"> • Integration of O&M with design of treatment plant • Introduction to asset management - Content of O&M plan for treatment plant • Monitoring and record keeping at treatment plant 	Presentation video	30 min	
	Quiz			Online Quiz	Self-paced	

Structure of Self-learning course on Designing of Faecal Sludge Treatment Systems

Session		Topic	Contents	Mode	Duration	
1	1a	Introduction to operationalising faecal sludge and septage management	<ul style="list-style-type: none"> Sanitation System Approaches Faecal Sludge vs Septage and Sewage Sanitation Value Chain Challenges in Sanitation Service 	Presentation video	25 min	45 min
	1b	Characterization of Faecal Sludge and Septage	<ul style="list-style-type: none"> Characteristics of faecal sludge, septage and sewage Operational factors 	Presentation video	10 min	
	Case Study Video			Video	10 min	
	Quiz			Online Quiz	Self-paced	
2	2a	Quantification of Faecal Sludge and Septage	<ul style="list-style-type: none"> Need of quantification of sludge Methods of quantification of sludge Stakeholders and data collection 	Presentation video	15 min	35 min
	2b	Containment, Emptying and Conveyance of Faecal Sludge and Septage	<ul style="list-style-type: none"> Types of containment systems Septic tank system Types of desludging methodologies Technical options for emptying conveyance 	Presentation video	20 min	
	Quiz			Online Quiz	Self-paced	
3	3a	Treatment of Faecal Sludge and Septage	<ul style="list-style-type: none"> Treatment targets and specific objectives Approaches for FSSM Treatment mechanisms 	Presentation video	15 min	40 min
	3b	Mechanized and Non-mechanized Treatment Units of Faecal Sludge and Septage and liquid treatment	<ul style="list-style-type: none"> Stages of treatment of faecal sludge and septage Selection of treatment technologies Non-mechanized treatment units Mechanized treatment units 	Presentation video	15 min	
	Case Study Video			Video	10 min	
	Quiz			Online Quiz	Self-paced	
4a	Financial aspects of FSSM	<ul style="list-style-type: none"> Financial components of FSSM Financial and contracting models 	Presentation video	10 min		
4	4b	Siting and Layout Planning of Treatment Plant	<ul style="list-style-type: none"> Site evaluation Site selection criteria Safety planning at treatment plant Importance of layout planning and examples Commissioning plan Handover process of the plant 	Presentation video	10 min	30 min
	Case Study Video			Video	10 min	
	Quiz			Online Quiz	Self-paced	
5	5	Operation and Maintenance of Treatment Plant	<ul style="list-style-type: none"> Integration of O&M with design of treatment plant Introduction to asset management- Content of O&M plan for treatment plant Monitoring and record keeping at treatment plant 	Presentation Video	30 min	30 min
	Quiz			Online Quiz	Self-paced	

PLANNING FOR FSSM

The course comprises content developed by NIUA, New Delhi, in partnership with Ecosan Services Foundation, Pune, with the support from the Training Modules Review Committee (TMRC) of the National Faecal Sludge and Septage Management Alliance (NFSSMA).

The module is split into the following parts: Presentation slides, Learning notes, and Workbook.

A) E-course on Planning for FSSM

Title	Faecal Sludge and Septage Management - Planning Module
Purpose	To build the capacities of ULB and state officials on planning of faecal sludge and septage management. This course will introduce the target audience to components of FSSM planning starting with approach and methodology for state and city level FSSM planning, aspects of FSSM, stakeholder's engagement, treatment approaches, financial aspects and O&M mechanisms. This course is crucial for officials of cities to be able to achieve the objectives under SBM-U 2.0 and AMRUT 2.0.
Learning Objectives	<ul style="list-style-type: none"> • Understand the approaches and methodologies for preparing a state investment plan for FSSM. • Linking city level planning approaches with citywide inclusive sanitation • Understanding the steps involved in carrying out the situation or feasibility assessment • Leverage various funding avenues and understand business models for FSSM at city level • Comprehend the aspects of FSSM, stakeholder's engagement, treatment approaches and financial and sustainability aspects.
Target Audience	Decision makers from state and ULBs, experts/sector partners working as TSU/ PMUs, faculties from nodal training institutes with professional experience in Faecal Sludge and Septage Management
Format	The course is divided into 10 sessions of 30-45 mins each in a self-paced format, consisting of an online session combined with reflection quiz and assessment exercises. The course also includes additional learning material and case study handouts/videos, apart from the session videos. This will help the participants to apply knowledge gained during the course in real world scenario(s).
Certification	Participants who complete all sessions & activities at the end of each session would be eligible for certification.

B) Self-learning course on Planning for FSSM

Title	Faecal Sludge and Septage Management - Planning Module
Purpose	To build the capacities of ULB and state officials on planning of faecal sludge and septage management. This course will introduce the target audience to components of FSSM planning starting with approach and methodology for state and city level FSSM planning, aspects of FSSM, stakeholder's engagement, treatment approaches, financial aspects and O&M mechanisms. This course is crucial for officials of cities to be able to achieve the objectives under SBM-U 2.0 and AMRUT 2.0.
Learning Objectives	<ul style="list-style-type: none"> • Understand the approaches and methodologies for preparing a state investment plan for FSSM. • Leverage various funding avenues and understand business models for FSSM at city level. • Comprehend the aspects of FSSM, stakeholder's engagement, treatment approaches and financial and sustainability aspects.
Target Audience	Decision makers from state and ULBs, and faculties from nodal training institutes.

Format	The course is divided into 8 sessions in 1-1.5 hours in a self-paced format, consisting of an online session combined with reflection quiz and assessment exercises. The course also includes additional learning material and case study handouts/videos, apart from the session videos. This will help the participants to apply knowledge gained during the course in real world scenario(s).
Certification	Participants who complete all sessions & activities at the end of each session would be eligible for certification.

Structure of the E-course on Planning for FSSM

Session	Topic	Contents	Mode	Duration
1	National trends in Urban Sanitation and Policies and Programmes	<ul style="list-style-type: none"> Urban Sanitation – National trend; Issues and Challenges in urban sanitation sector in India; Urban Sanitation Policy and Programs in India; Funding opportunities for FSSM 	Presentation video	45 mins
	Quiz		Online Quiz	Self-paced
2	Approaches and Methodology of Planning	<ul style="list-style-type: none"> Approaches of Planning; Tools for Planning; Stages of Planning 	Presentation video	45 mins
	Quiz		Online Quiz	Self-paced
3	State level approaches for FSSM planning	<ul style="list-style-type: none"> State level implementation of planning approaches for FSSM; Developing a State Investment Plan; 	Presentation video	45 mins
		Case studies – State of Tamil Nadu, Maharashtra and Uttarakhand	Video	
	Quiz		Online Quiz	Self-paced
4	City level approaches for FSSM planning	<ul style="list-style-type: none"> City level Planning approaches for FSSM; Integrated Municipal Information System; City Wide Inclusive Sanitation aspects 	Presentation video	45 min
		<ul style="list-style-type: none"> Case study – Journey to ODF++, Wai (Maharashtra); Evidence based Planning, Nagda (MP) 	Video	
	Quiz		Online Quiz	Self-paced
5	FSSM- An overview of key concepts	<ul style="list-style-type: none"> Difference between waste products; Sanitation systems; FSSM value chain; Quantification of FSS; Demand and scheduled desludging; Technical specifications for quality assurance in FSSM 	Presentation video	45 min
	Quiz		Online Quiz	Self-paced
6	Stakeholder Engagement Tools and Programs	<ul style="list-style-type: none"> Stakeholders Analysis; Engagement with Stakeholders; IEC and BCC activities for FSSM 	Presentation video	30 mins
	Quiz		Online Quiz	Self-paced

7	7	Situation assessment - Introduction to feasibility assessment	<ul style="list-style-type: none"> Assessment of initial situation; Data to be collated; Tools and methods for data collection 	Presentation video	40 mins
	Quiz			Online Quiz	Self-paced
8	8	Treatment approaches in FSSM	<ul style="list-style-type: none"> Selection criteria for FSS treatment technologies; FSS treatment objectives and treatment chain; Approaches to FSS treatment 	Presentation video	45 mins
	Quiz			Online Quiz	Self-paced
9	9	Financing Aspects of FSSM	<ul style="list-style-type: none"> Financing FSSM; Capital expenditure, Operational expenditure; Income and revenue, Annualized cost; Financial flow models 	Presentation video	40 mins
	Quiz			Online Quiz	Self-paced
10	10	Operation & Maintenance aspects of FSSM	<ul style="list-style-type: none"> O&M planning; Monitoring; Recordkeeping; Occupational Health and Safety 	Presentation video	45 mins
			Case studies	Video	
	Quiz			Online Quiz	Self-paced

Structure of Self-learning course on Planning for FSSM

Session	Topic	Contents	Mode	Duration	
1	1	National trends in Urban Sanitation and Policies and Programmes	<ul style="list-style-type: none"> Urban Sanitation – National trend; Issues and Challenges in urban sanitation sector in India; Urban Sanitation Policy and Programs in India; Funding opportunities for FSSM 	Interactive videos	7 mins
	Quiz			Online Quiz	Self-paced
2	2	FSSM- An overview of key concepts	<ul style="list-style-type: none"> Difference between waste products; Sanitation systems; FSSM value chain and challenges; Quantification of FSS; Demand and scheduled desludging; Technical specifications for quality assurance in FSSM 	Interactive videos	10 mins
	Quiz			Online Quiz	Self-paced
3	3	Approaches and Methodology of Planning	<ul style="list-style-type: none"> Approaches of Planning; Tools for Planning; Stages of Planning 	Interactive videos	10 mins
	Quiz			Online Quiz	Self-paced

4	4	State level approaches for FSSM planning	<ul style="list-style-type: none"> State level implementation of planning approaches for FSSM; Developing a State Investment Plan; 	Interactive Video	10 mins
			Case studies – State of Tamil Nadu, Maharashtra and Uttarakhand		
Quiz				Online Quiz	Self-paced
5	5	Stakeholder Engagement Tools and Programs	<ul style="list-style-type: none"> Stakeholders Analysis; Engagement with Stakeholders; IEC and BCC activities for FSSM 	Interactive videos	5 mins
			Case studies		
Quiz				Online Quiz	Self-paced
6	6	Treatment approaches in FSSM	<ul style="list-style-type: none"> Selection criteria for FSS treatment technologies; FSS treatment objectives and treatment chain; Approaches to FSS treatment 	Interactive videos	7 mins
			Case studies		
			Quiz		
7	7	Financing Aspects of FSSM	<ul style="list-style-type: none"> Financing FSSM; Capital expenditure, Operational expenditure; Income and revenue, Annualized cost; Financial flow models 	Interactive videos	6-7 mins
			Case studies		
Quiz				Online Quiz	Self-paced
8	8	Operation & Maintenance aspects of FSSM	<ul style="list-style-type: none"> O&M planning; Monitoring; Recordkeeping; Occupational Health and Safety 	Interactive videos	10mins
			Case studies		
Quiz					



Integrated Wastewater and Septage Management

INTEGRATED WASTEWATER AND SEPTAGE MANAGEMENT (IWSM) PLANNING MODULE

The course comprises content developed by NIUA, New Delhi, in partnership with Ecosan Services Foundation, Pune, with the support from the Training Modules Review Committee (TMRC) of the National Faecal Sludge and Septage Management Alliance (NFSSMA).

The module is split into the following parts: [Presentation slides](#), [Learning notes](#) and [Workbook](#).

A) E-course on IWSM Planning

Title	Integrated Wastewater and Septage Management - Planning Module
Purpose	<p>The course introduces a city/town perspective of an integrated planning approach to managing wastewater and septage including methods and technological options for treatment.</p> <p>With the announcement of SBM-U 2.0 and AMRUT 2.0, the continuation of NMCG and the recommendations of the 15th Finance Commission, this course provides participants with a holistic understanding of wastewater and septage management approaches, which is a key component in these national missions.</p>
Learning Objectives	<ul style="list-style-type: none"> Gain in depth knowledge of wastewater and septage management principles and approaches Understanding of different sanitation systems and technologies with a focus on wastewater and septage conveyance technologies Gain knowledge about the different treatment principles and technologies available for wastewater and septage management
Target Audience	Decision-makers, technical and planning officials from state governments and ULBs basic understanding and professional experience in wastewater and septage management.
Format	The course is divided into 8 sessions of 45-60 mins each in a self-paced format, consisting of an online session combined with reflection quiz and assessment exercises. The course also includes additional learning material and case study handouts/videos, apart from the session videos. This will help the participants to apply knowledge gained during the course in real world scenario(s).
Certification	Participants who complete all sessions & activities at the end of each session would be eligible for certification.

B) Self-learning course on IWSM Planning

Title	Planning of Integrated Wastewater and Septage Management in Urban Areas
Purpose	<p>The course provides a holistic understanding of wastewater and septage management and introduces an integrated planning approach for managing wastewater and septage at the city/town level. The conceptual knowledge pertaining to public service approach i.e. City Wide Inclusive Sanitation (CWIS) would enable managers to make concrete/viable decisions about city level implementation for managing liquid waste, keeping inclusivity and sustainability at the centre.</p> <p>The course is designed to enable the participants to plan for integrated wastewater and septage management, through various national missions namely, Smart City Mission (SCM), SBM-U 2.0, AMRUT 2.0, NMCG and the recommendations of the 15th Finance Commission and thereby achieving the targets of SDG 6.2 and 6.3.</p> <p>Since WASH is one of the crucial sectors under SCM the course is crucial for officials from Smart Cities to plan for city wide inclusive sanitation services.</p>

Learning Objectives	<ul style="list-style-type: none"> Gain knowledge about urban sanitation scenario and the genesis of urban sanitation programme and policies of India Understand various sanitation systems and technologies existing in urban areas Comprehend city-level integrated planning approaches for wastewater and septage management Engage with the various stakeholders involved in the process Understand various methods of project delivery prevailing in the Indian market Learn about the concept of CWIS and its importance in wastewater and septage management
Target Audience	The course is curated for decision-makers, technical and planning officials from central, state govt, local governments and officials from other autonomous/parastatal agencies engaged in the urban sanitation sector.
Format	<p>The course is divided into 10 sessions, covering various aspects such as sustainable sanitation, national missions and programmes, sanitation systems and technologies, levels of wastewater and septage management, stakeholders management, project management and sustainability.</p> <p>This is a 1.5-2 hours course in a self-paced format, consisting of an online session combined with reflection quizzes and assessment exercises. The course also includes additional learning material and case study handouts/videos, apart from the session videos. This will help the participants to apply knowledge gained during the course in real-world scenario(s).</p>
Certification	Participants who complete all sessions & activities at the end of each session would be eligible for certification.

Structure of the E-course on IWSM- Planning Module

Session	Topic	Contents	Mode	Duration
1	1a	<ul style="list-style-type: none"> Natural and built environment Environmental sanitation EcoSan Concept Waste products Flow of waste products 	Presentation video	25 min
	1b	<ul style="list-style-type: none"> Sanitation systems - Wet & Dry systems Sewered systems, Non sewerred systems and Hybrid systems Functional groups - User Interface, Containment, Collection and conveyance, Treatment and Reuse or Disposal 	Presentation video	20 min
	Case Study Video		Video	5 min
	Quiz		Online Quiz	Self-paced
2	2a	<ul style="list-style-type: none"> User interface - Flush toilet, UDDT, Vacuum Toilet Containment systems - Twin Pit, Septic Tank Collection & Conveyance systems - Gravity sewers, solid free sewers, simplified sewers, vacuum trucks, vacutugs 	Presentation video	30 min
	2b	<ul style="list-style-type: none"> Offsite sanitation system Onsite sanitation system Hybrid sanitation system 	Video	10 min
	Case Study Video		Video	5 min
	Quiz		Online Quiz	Self-paced

3	3a	Liquid waste management	Centralized wastewater management and Decentralized wastewater management - key components and aspects	Presentation video	30 min	65 min
	3b	Aspects of Decentralized Wastewater Management	<ul style="list-style-type: none"> Enabling environment Economic aspects Technical aspects Legal aspects Regulatory aspects Social aspects 	Presentation video	30 min	
	Case Study Video			Video	5 min	
	Quiz			Online Quiz	Self-paced	
4	4	Decentralized Wastewater Management	<ul style="list-style-type: none"> Quantifying black and grey water for following scenarios - Domestic, Commercial, Public Utility Diurnal variation of wastewater generation Handouts on Septic Tank (IS 2470 Part I & II) Handout on Code of Basic Requirements for Water supply, Sanitation and Drainage (IS 1172) 	Presentation video	40 min	50 min
	Case Study Video			Video	10 min	
	Quiz			Online Quiz	Self-paced	
5	5	Wastewater Treatment Principles and Technologies	<ul style="list-style-type: none"> Objectives of wastewater treatment Treatment processes and stages Component of Sewage Treatment Plant Multi barrier approach Layout of STP Non mechanized treatment systems Mechanized treatment systems Selection criteria 	Presentation video	45 min	60 min
	Case Study Video			Video	15 min	
	Quiz			Online Quiz	Self-paced	
6	6a	Understanding Faecal Sludge and Septage Management	<ul style="list-style-type: none"> Need of FSSM Components of FSSM Planning for FSSM- Quantification of Septage, On demand vs Scheduled desludging Approaches for FSS Treatment - Co-Treatment at STP or MSW plant, FSTP, Deep Row Entrenchment 	Presentation video	45 min	60 min
	Case Study Video			Video	15 min	
	6b	FSSM Planning	The participants will be using the information provided in Session 6a to quantify the septage and faecal sludge. They will also be calculating the number of vacuum trucks required for providing collection service for the quantified sludge	Online Quiz followed by an explanation video	Self-paced	

7	7	Stakeholder Management	<ul style="list-style-type: none"> • Identification of stakeholders • Characterisation of stakeholders • IEC campaign 	Presentation video	35 min	40 min
	Case Study Video			Video	5 min	
	Quiz			Online Quiz	Self-paced	
8	8a	Faecal Sludge and Septage Treatment	<ul style="list-style-type: none"> • Treatment objectives • Treatment stages • Treatment units • FSTPs in India 	Presentation video	20 min	40 min
	8b	Financial Aspects of FSSM	<ul style="list-style-type: none"> • Financing FSSM • Financial transaction in FSSM • Financial models 	Presentation video	20 min	
	8c	O&M cost of FSSM	<ul style="list-style-type: none"> • Calculating the O&M cost for collection • Conveyance and treatment of faecal sludge and septage 	Online Quiz followed by an explanation video	Self-paced	

Structure of Self-learning course on IWSM Planning Module

Session	Topic	Contents	Mode	Duration	
1	1	Sustainable Sanitation & Water Management	<ul style="list-style-type: none"> • Environmental Health; • Waste products and EcoSan; • Urban sanitation challenges in India; • Need for a Paradigm Shift: CWIS and IWSM 	Interactive Video	10 mins
	Quiz			Online Quiz	Self-paced
2	2	National Missions, Programmes and Guidelines	<ul style="list-style-type: none"> • Growing recognition FSSM in India; • National missions and programs; • Advisories and guidelines related to sanitation in India; • Convergence and funding options 	Interactive Video	6 mins
	Quiz			Online Quiz	Self-paced
3	3	Sanitation Systems	<ul style="list-style-type: none"> • Sanitation systems- Definition & Objectives; • Role of CWIS in sanitation systems; • Types of sanitation systems; • Functional groups - Introduction; • Functional groups - Dry sanitation system 	Interactive Video	10 mins
	Quiz			Online Quiz	Self-paced
4	4	Sanitation Technologies	<ul style="list-style-type: none"> • Wet sanitation systems; • Functional groups - Wet sanitation system; • Adopting CWIS principles 	Interactive Video	8 mins
	Quiz			Online Quiz	Self-paced
5	5	Liquid Waste Management	<ul style="list-style-type: none"> • Levels of wastewater management; • Centralized wastewater management; • Decentralized wastewater management; • Other aspects of liquid waste management; • Planning of Sanitation systems 	Interactive Video	10 mins
	Quiz			Online Quiz	Self-paced

6	6	Aspects of Decentralised Wastewater Management	<ul style="list-style-type: none"> • Enabling environment + CWIS Approach; • Economic aspects; • Technical aspects; • Legal aspects; • Regulatory aspects; • Social aspects 	Interactive Video	10 mins
	Quiz			Online Quiz	Self-paced
7	7	Understanding Faecal Sludge and Septage Management	<ul style="list-style-type: none"> • Needs and challenges in FSSM; • Planning for FSSM; • Approaches to FSS treatment 	Interactive Video	12 mins
	Case study video				
	Quiz			Online Quiz	Self-paced
8	8	Stakeholder Management	<ul style="list-style-type: none"> • Stakeholder analysis; • Stakeholder engagement 	Interactive Video	7 mins
	Quiz			Online Quiz	Self-paced
9	9	Project Management	<ul style="list-style-type: none"> • Project Management; • Project delivery method 	Interactive Video	10 mins
	Quiz			Online Quiz	Self-paced
10	10	Operation & Maintenance and Sustainability	<ul style="list-style-type: none"> • Operation and Maintenance; • Occupational health and Safety; • Public Awareness and Participation (IEC/ BCC) 	Interactive Video	10 mins
Quiz			Online Quiz	Self-paced	

INTEGRATED WASTEWATER AND SEPTAGE MANAGEMENT (IWSM) DESIGN MODULE

The course comprises content developed by NIUA, New Delhi, in partnership with Ecosan Services Foundation, Pune, with the support from the Training Modules Review Committee (TMRC) of the National Faecal Sludge and Septage Management Alliance (NFSSMA).

The module is split into the following parts: [Presentation slides](#), [Learning notes](#) and [Workbook](#).

A) E-course on IWSM Design

Title	Integrated Wastewater and Septage Management - Design Module
Purpose	<p>The Government of India has made sanitation its priority through the launch of Swachh Bharat Mission. SBM-U 2.0 goes beyond eliminating open defecation in cities, to focus on planning sanitation systems at city-level, through integrated wastewater and septage management targeted at recycling and reuse.</p> <p>Further, the recently announced AMRUT 2.0 emphasizes on creating a circular economy of water by ensuring treatment and reuse of wastewater and faecal sludge. This course provides participants with a holistic understanding of designing wastewater and septage management solutions, to address the above mentioned priorities under these national missions.</p>
Learning Objectives	<ul style="list-style-type: none">• Understand priorities under various national urban missions for wastewater and septage management to address aspects of the circular economy.• Gain in-depth knowledge about sanitation systems and understand the concept and principles of citywide inclusive sanitation.• Get hands-on experience in designing wastewater and septage treatment solutions.• To leverage various funding avenues and understand contracting mechanisms at the city level.• Comprehend the aspects of IWSM, such as O&M and sustainability, occupational safety, public awareness and participation.
Target Audience	Officials with an engineering background and professional experience in wastewater and septage management such as technical faculties from nodal training institutes, technical officials/ engineers from state govt, parastatal bodies and ULBs; consultants from TSU/PMUs and sector partners.
Format	The course is divided into 10 sessions of 45-60 mins each in a self-paced format, consisting of an online session combined with reflection quiz and assessment exercises. The course also includes additional learning material and case study handouts/videos, apart from the session videos. This will help the participants to apply knowledge gained during the course in real world scenario(s).
Certification	Participants who complete all sessions & activities at the end of each session would be eligible for certification.

B) Self-learning course on IWSM Design

Title	Integrated Wastewater and Septage Management – Design
Purpose	<p>Swachh Bharat Mission Urban, Phase I met its objectives by increasing access to toilets and making the cities Open Defecation Free. In order to sustain the momentum and reduce the environmental impact of wastewater from the households, the Government of India plans to launch Phase II with a focus on the management of greywater and septage management.</p> <p>This course is an advanced version of the Integrated Wastewater and Septage Management – Planning course. It caters to various aspects of planning and decision making for wastewater and septage management at city scale.</p>
Learning Objectives	<p>To address priorities under SBM (U) 2.0, understand the design aspects of integrated wastewater and septage management</p> <p>To understand the components of wastewater and septage management and overview of technical options for sanitation systems.</p> <p>Gain knowledge about engaging stakeholders, managing project delivery, and sustainability</p>
Target Audience	Officials with an engineering background and professional experience in wastewater and septage management such as technical faculties from nodal training institutes, technical officials/ engineers from state govt, parastatal bodies and ULBs; consultants from TSU/PMUs and sector partners.
Format	The course is divided into 10 sessions of 1.5-2 hours in a self-paced format, consisting of an online session combined with reflection quiz and assessment exercises. The course also includes additional learning material and case study handouts/videos, apart from the session videos. This will help the participants to apply knowledge gained during the course in real world scenario(s).
Certification	Participants who complete all sessions & activities at the end of each session would be eligible for certification.

Structure of the E-course on IWSM- Design Module

Session	Topic	Contents	Mode	Duration
1	1	<p>Introduction to Integrated Wastewater and Septage Management (IWSM)</p> <ul style="list-style-type: none"> Natural and built environment; Environmental sanitation; Sources of Pollution - Point and Non-point Pollution; Waste products and its characteristics 	Presentation video	45 mins
	Quiz		Online Quiz	Self-paced
2	2	<p>Missions and Programs - Journey of Urban Sanitation in India</p> <ul style="list-style-type: none"> Growing recognition of FSSM; National missions and programs; Policies & Guidelines 	Presentation video	45 mins
	Quiz		Online Quiz	Self-paced

3	3	SBM-U 2.0	<ul style="list-style-type: none"> • SBM 2.0 objectives; • Components of funding; • City Wastewater Infrastructure Status 	Presentation video	40 mins
	Quiz			Online Quiz	Self-paced
4	4	Planning Approach	<ul style="list-style-type: none"> • City Wide Inclusive Sanitation; • City Wastewater Infrastructure Status; • Wastewater Management Approaches; • Sanitation Systems Approach; • Sewered Sanitation; • Stages in DPR preparation 	Presentation video	45 mins
	Quiz			Online Quiz	Self-paced
5	5	Baseline Surveys and Assessment	<ul style="list-style-type: none"> • Identification of Project area; • Application of Remote Sensing and Geographic Information System (GIS); • Access to Water and Sanitation; • Investigation and Pollution Monitoring 	Presentation video	40 mins
	Quiz			Online Quiz	Self-paced
6	6	Design Aspects	<ul style="list-style-type: none"> • Developing Options; • Water Consumption vs Water Supply; • Population Projection; • Design Periods; • Intermediate Solutions; • Reuse Options – Circular Economy 	Presentation video	45 mins
	Quiz			Online Quiz	Self-paced
7	7	Collection and Conveyance System	<ul style="list-style-type: none"> • Design Flows; • Computational Method; • Actual Measurement Method; • Interception and Diversion Components 	Presentation video	45 mins
	Quiz			Online Quiz	Self-paced
8	8	Wastewater Treatment Technologies	<ul style="list-style-type: none"> • Introduction to Wastewater Treatment; • Wastewater Treatment Technologies; • Selection of Treatment Technology; • Sewage Sludge Management 	Presentation video	45 mins
	Quiz			Online Quiz	Self-paced
9	9	Project Management	<ul style="list-style-type: none"> • DPR components and review; • Financial Modelling: Life Cycle Cost, Net Present Value and Equivalent Annual Cost; • Project Develivery Method 	Presentation video	45 mins
	Quiz			Online Quiz	Self-paced
10	10	Operation & Maintenance and Sustainability	<ul style="list-style-type: none"> • O&M of drains, I&D works, STPs; • Public awareness & participation; • Reducing combined sewer overflow 	Presentation video	45 min
	Quiz			Online Quiz	Self-paced

Structure of Self-learning course on IWSM Design Module

Session		Topic	Contents	Mode	Duration
1	1	Introduction to Integrated Wastewater and Septage Management (IWSM)	<ul style="list-style-type: none"> • Natural and built environment; • Environmental sanitation; • Sources of Pollution - Point and Non-point Pollution; • Waste products and its characteristics 	Interactive Video	6 mins
	Quiz			Online Quiz	Self-paced
2	2	Missions and Programs - Journey of Urban Sanitation in India	<ul style="list-style-type: none"> • Growing recognition of FSSM; • National missions and programs; • Policies & Guidelines 	Interactive Video	6 mins
	Quiz			Online Quiz	Self-paced
3	3	SBM-U 2.0	<ul style="list-style-type: none"> • SBM 2.0 objectives; • Components of funding; • City Wastewater Infrastructure Status 	Interactive Video	5 mins
	Quiz			Online Quiz	Self-paced
4	4	Planning Approach	<ul style="list-style-type: none"> • City Wide Inclusive Sanitation; • City Wastewater Infrastructure Status; • Wastewater Management Approaches; • Sanitation Systems Approach; • Sewered Sanitation; • Stages in DPR preparation 	Interactive Video	10 mins
	Quiz			Online Quiz	Self-paced
5	5	Baseline Surveys and Assessment	<ul style="list-style-type: none"> • Identification of Project area; • Application of Remote Sensing and Geographic Information System (GIS); • Access to Water and Sanitation; • Investigation and Pollution Monitoring 	Interactive Video	4 mins
	Quiz			Online Quiz	Self-paced
6	6	Design Aspects	<ul style="list-style-type: none"> • Developing Options; • Water Consumption vs Water Supply; • Population Projection; • Design Periods; • Intermediate Solutions; • Reuse Options – Circular Economy 	Interactive Video	7 mins
	Quiz			Online Quiz	Self-paced

7	7	Collection and Conveyance System	<ul style="list-style-type: none"> • Design Flows; • Computational Method; • Actual Measurement Method; • Interception and Diversion Components 	Interactive Video	8 mins
	Quiz			Online Quiz	Self-paced
8	8	Wastewater Treatment Technologies	<ul style="list-style-type: none"> • Introduction to Wastewater Treatment; • Wastewater Treatment Technologies; • Selection of Treatment Technology; • Sewage Sludge Management 	Interactive Video	10 mins
	Quiz			Online Quiz	Self-paced
9	9	Project Management	<ul style="list-style-type: none"> • DPR components and review; • Financial Modelling: Life Cycle Cost, Net Present Value and Equivalent Annual Cost; • Project Delivery Method 	Interactive Video	12 mins
	Quiz			Online Quiz	Self-paced
10	10	Operation & Maintenance and Sustainability	<ul style="list-style-type: none"> • O&M of drains, I&D works, STPs; • Public awareness & participation; • Reducing combined sewer overflow 	Interactive Video	11 mins
Quiz			Online Quiz	Self-paced	

CO-TREATMENT OF FAECAL SLUDGE AND SEPTAGE WITH SEWAGE IN SEWAGE TREATMENT PLANT

The course comprises content developed by NIUA, New Delhi, in partnership with Ecosan Services Foundation, Pune, with the support from the Training Modules Review Committee (TMRC) of the National Faecal Sludge and Septage Management Alliance (NFSSMA).

The module is split into the following parts: [Presentation slides](#), [Learning notes](#) and [Workbook](#).

A) E-course on Co-treatment of Faecal Sludge with Sewage in Sewage Treatment Plant

Title	Co-treatment of Faecal Sludge with Sewage in Sewage Treatment Plant
Purpose	<p>This course gives the participants hands-on knowledge about designing a co-treatment system including assessing existing STP capacities and available treatment technology options.</p> <p>With the launch of SBM-U 2.0 and AMRUT 2.0 and the recommendations of the 15th Finance Commission, this course provides participants a detailed understanding for adopting co-treatment, which is a key component under septage management in these national missions.</p>
Learning Objectives	<ul style="list-style-type: none"> • Understand the working principles of Sewage Treatment Plant • Understand how to conduct feasibility assessment of existing sewage treatment plants (STPs) to evaluate co-treatment potential and quantify the amount of FSS that can be co-treated • Know the approaches for adding faecal sludge in a STP for co-treatment along with the design of additional components such as septage receiving station • Gain insight into the operation and maintenance as well as mitigation measures for different treatment units in a STP
Target Audience	<p>Officials with an engineering background and professional experience in wastewater and septage management such as technical faculties from nodal training institutes, technical officials/ engineers from state govt, parastatal bodies and ULBs; consultants from TSU/ PMUs and sector partners.</p>
Format	<p>The course is divided into 11 sessions of 90 mins each in a self-paced format, consisting of an online session combined with reflection quiz and assessment exercises. The course also includes additional learning material and case study handouts/videos, apart from the session videos. This will help the participants to apply knowledge gained during the course in real world scenario(s).</p>
Certification	<p>Participants who complete all sessions & activities at the end of each session would be eligible for certification.</p>

B) Self-learning course on Co-treatment of Faecal Sludge with Sewage in Sewage Treatment Plant

Title	Co-treatment of Faecal Sludge with Sewage in Sewage Treatment Plant
Purpose	<p>This course is designed to introduce the basic concepts and planning approaches for adopting co-treatment of faecal sludge with sewage in existing sewage treatment plants.</p> <p>With the launch of SBM-U 2.0 and AMRUT 2.0 and the recommendations of the 15th Finance Commission, this course provides participants with an overview of adopting co-treatment, which is a key component under septage management in these national missions.</p>
Learning Objectives	<ul style="list-style-type: none"> • Understanding characteristics and methods of quantifying faecal sludge and septage (FSS) • Financial viability and planning of regular desludging of on-site sanitation systems such as septic tanks, at town level • Understand the FSS treatment principles, for mechanized and non-mechanized treatment technologies in different contexts/geographies. • Develop a know-how of different design aspects such as treatment technologies, siting and layout planning, and operation and maintenance of a treatment plant
Target Audience	Professionals, consultants and PMUs of missions, experts, practitioners and government officials having an engineering background and professional experience in wastewater and septage management
Format	The course is divided into 5 sessions of 2.5-3 hours in a self-paced format, consisting of an online session combined with reflection quiz and assessment exercises. The course also includes additional learning material and case study handouts/videos, apart from the session videos. This will help the participants to apply knowledge gained during the course in real world scenario(s).
Certification	Participants who complete all sessions & activities at the end of each session would be eligible for certification.

Structure of the E-course on Co-treatment of Faecal Sludge and Septage with Sewage in Sewage Treatment Plant

Session	Topic	Contents	Mode	Duration	
1	1	<ul style="list-style-type: none"> • Urbanization and urban sanitation in India; • Relation between co-treatment and CWIS; • Achieving SDGs through co-treatment; • Growing recognition of FSSM in India; • National missions and programs focusing on co-treatment; • Advisories and guidelines related to sanitation in India; • Convergence and funding for co-treatment 	Presentation video	45 min	45 min
	Quiz		Online Quiz	Self-paced	
2	2	<ul style="list-style-type: none"> • Stages of FSSM • Approaches for treatment • Objective of treatment • Treatment mechanisms • Stages of treatment • Standards for treatment • Rationale for co - treatment 	Presentation video	50 min	50 min
	Quiz		Online Quiz	Self-paced	

3	3a	Characterization of Liquid Waste: Faecal Sludge, Septage and Sewage	<ul style="list-style-type: none"> Parameters for characterization Characteristics of sewage Types of sludge and its characteristics 	Presentation video	30 min	80 min
	3b	Sewage Treatment Plant & Co-treatment	<ul style="list-style-type: none"> Objectives of treatment Treatment mechanisms Treatment chain - Multi Barrier Approach Addition of sludge for co-treatment Impact of unscientific co-treatment of sludge 	Presentation video	50 min	
	Quiz			Online Quiz	Self-paced	
4	4	Planning of Co-Treatment of Sludge and Sewage	<ul style="list-style-type: none"> Identifying co-treatment opportunities Precautions for adding sludge in sewerage system Stages of planning Checklist for collection of data, Administrative controls for conducting co-treatment of septage with sewage 	Presentation video	50 min	60 min
	Case Study Video			Video	10 min	
	Quiz			Online Quiz	Self-paced	
5	5	Septage Receiving Station	<ul style="list-style-type: none"> Importance of septage receiving station Components of septage receiving station Types of septage receiving station Solid Liquid Separation Standard Operating Procedure at receiving station 	Presentation video	35 min	50 min
	Case Study Video			Video	15 min	
	Quiz			Online Quiz	Self-paced	
6	6	Co-treatment in Liquid Stream at STP	<ul style="list-style-type: none"> Treatment units in liquid stream Design criteria Precautions and checks for co-treatment Mitigating the impact of co-treatment through O&M 	Presentation video	50 min	50 min
	Quiz			Online Quiz	Self-paced	
7	7	Co-treatment in Sludge Stream at STP	<ul style="list-style-type: none"> Treatment units in sludge stream Design criteria Precautions and checks for co-treatment Mitigating the impact of co-treatment through O&M 	Presentation video	50 min	50 min
	Quiz			Online Quiz	Self-paced	

8	8	Disinfection of Sludge	<ul style="list-style-type: none"> • Treatment objectives • Co-composting • Solar Drying House • Thermal Drying • Thermal treatment of biosolids 	Presentation video	30 min	40 min
	Case Study Video			Video	10 min	
	Quiz			Online Quiz	Self-paced	

Structure of Self-learning course on Co-treatment of Faecal Sludge with Sewage in Sewage Treatment Plant

Session		Topic	Contents	Mode	Duration
1	1	Urbanisation and need for adopting co-treatment	<ul style="list-style-type: none"> • Urbanization in India; • Sanitation challenges in India; • Relevance of co-treatment in India; • Relation between co-treatment and CWIS; • Achieving SDGs through co-treatment 	Interactive Video	7-8 min
	Quiz			Online Quiz	Self-paced
2	2	National programs and missions	<ul style="list-style-type: none"> • Growing recognition of FSSM in India; • List of national missions and programs focusing on co-treatment; • Advisories and guidelines related to sanitation in India; • Convergence and funding for co-treatment 	Interactive Video	10 min
	Quiz				
3	3	Introduction to co-treatment	<ul style="list-style-type: none"> • Parameters for characterization • Characteristics of sewage • Types of sludge and its characteristics 	Interactive Video	10 min
	Quiz				
			<ul style="list-style-type: none"> • Objectives of treatment • Treatment mechanisms • Treatment chain - Multi Barrier Approach • Addition of sludge for co-treatment • Impact of unscientific co-treatment of sludge 		

4	4	Planning for co-treatment of FSS with sewage at STP	<ul style="list-style-type: none"> • Important activities before adopting co-treatment; • Decision-making framework for co-treatment 	Interactive Video	8 min
	Quiz		I	Online Quiz	Self-paced
5	5	Co-treatment at STP	<ul style="list-style-type: none"> • Block flow diagram of an STP; • Addition of FSS in an STP; • Impact of FSS addition; • Best practices for FSS addition in an STP 	Interactive Video	10 min
	Quiz			Online Quiz	Self-paced
6	6	O&M and sustainability of co-treatment	<ul style="list-style-type: none"> • Checklist of actions during implementation of co-treatment; • Existing FSS collection and transportation system; • Setting up contractual mechanism and financial model; • O&M works at STP to handle FSS; • Treatment standards and regulations to be followed 	Interactive Video	10 min
	Quiz			Online Quiz	Self-paced



National Institute of Urban Affairs

National Institute of Urban Affairs

1st Floor, Core 4B, India Habitat Centre, Lodhi Road, New Delhi - 110003

Phone: 011-24617517, 24617543, 24617595, Fax: 011-24617513

E-mail: niua@niua.org • Website: www.niua.org, scbp.niua.org