Training course on Resilient Water Supply and Sanitation Systems

Professional Development Training Course Outline

Category	Civil Engineering and Infrastructure Management	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Access to safe and reliable water supply and sanitation (WSS) systems is fundamental to public health, economic development, and social well-being. However, these critical urban and rural services are increasingly exposed to a multitude of shocks and stresses, including climate change impacts (e.g., droughts, floods, extreme weather), population growth, aging infrastructure, and contamination risks. Disruptions to WSS can have cascading effects, leading to public health crises, economic losses, and social instability. Traditional WSS planning often focuses on efficiency and expansion, but the escalating frequency and intensity of these challenges necessitate a paradigm shift towards building inherent resilience within these systems. This involves not only withstanding adverse events but also adapting to changing conditions and recovering rapidly from disruptions. Training Course on Resilient Water Supply and Sanitation Systems is meticulously designed to equip civil engineering, public health, urban planning, and utility management professionals with the specialized knowledge and practical skills required to assess vulnerabilities and implement robust resilience strategies for water supply and sanitation infrastructure. Participants in this course will gain a comprehensive understanding of the various threats to WSS systems and learn to apply methodologies for conducting resilience assessments specific to water and sanitation infrastructure. The curriculum will delve into cutting-edge adaptation strategies, including diversified water sources, decentralized treatment, smart monitoring technologies, nature-based solutions, and adaptive governance frameworks. Through a blend of theoretical instruction, hands-on planning exercises, and in-depth case studies of successful resilience-building initiatives in WSS sectors globally, attendees will develop the expertise to identify critical vulnerabilities, formulate resilience plans, evaluate the economic benefits of resilience investments, and navigate the complex policy and financing landscapes associated with resilient WSS development. This course is indispensable for professionals committed to safeguarding public health and ensuring continuous access to essential services. By mastering the principles and practices of resilient water supply and sanitation systems, participants can lead efforts to minimize service disruptions, enhance community well-being, and contribute directly to global sustainability and climate adaptation goals.

Programme Curriculum

Training Course on Resilient Water Supply and Sanitation Systems

Introduction

Access to safe and reliable water supply and sanitation (WSS) systems is fundamental to public health, economic development, and social well-being. However, these critical urban and rural services are increasingly exposed to a multitude of shocks and stresses, including climate change impacts (e.g., droughts, floods, extreme weather), population growth, aging infrastructure, and contamination risks. Disruptions to WSS can have cascading effects, leading to public health crises, economic losses, and social instability. Traditional WSS planning often focuses on efficiency and expansion, but the escalating frequency and intensity of these challenges necessitate a paradigm shift towards building inherent resilience within these systems. This involves not only withstanding adverse events but also adapting to changing conditions and recovering rapidly from disruptions. **Training Course on Resilient Water Supply and Sanitation Systems** is meticulously designed to equip civil engineering, public health, urban planning, and utility management professionals with the specialized knowledge and practical skills required to assess vulnerabilities and implement robust resilience strategies for water supply and sanitation infrastructure.

Participants in this course will gain a comprehensive understanding of the various threats to WSS systems and learn to apply methodologies for conducting resilience assessments specific to water and sanitation infrastructure. The curriculum will delve into cutting-edge adaptation strategies, including diversified water sources, decentralized treatment, smart monitoring technologies, nature-based solutions, and adaptive governance frameworks. Through a blend of theoretical instruction, hands-on planning exercises, and in-depth case studies of successful resilience-building initiatives in WSS sectors globally, attendees will develop the expertise to identify critical vulnerabilities, formulate resilience plans, evaluate the economic benefits of resilience investments, and navigate the complex policy and financing landscapes associated with resilient WSS development. This course is indispensable for professionals committed to safeguarding public health and ensuring continuous access to essential services. By mastering the principles and practices of resilient water supply and sanitation systems, participants can lead efforts to minimize service disruptions, enhance community well-being, and contribute directly to global sustainability and climate adaptation goals.

Course Objectives

Upon completion of this course, participants will be able to:

1. Understand the major threats and vulnerabilities to water supply and sanitation (WSS) systems.
2. Apply methodologies for conducting resilience assessments for WSS infrastructure.
3. Identify critical components and interdependencies within WSS networks.
4. Develop strategies for diversifying water sources and enhancing water security.
5. Explore decentralized and modular WSS solutions for increased robustness.
6. Implement resilient design principles for water and wastewater treatment facilities.
7. Understand the role of smart technologies and real-time monitoring in WSS resilience.
8. Formulate emergency preparedness and response plans for WSS disruptions.
9. Navigate policy, regulatory, and institutional frameworks supporting WSS resilience.
10. Evaluate the economic benefits and costs of investing in resilient WSS infrastructure.
11. Communicate WSS risks and resilience strategies effectively to stakeholders and communities.
12. Analyze case studies of successful resilience-building in WSS systems globally.

13. Drive the integration of resilience principles into WSS planning, operation, and investment

Target Audience

This course is essential for professionals seeking to enhance the resilience of water supply and sanitation systems:

1. Civil Engineers: Specializing in water and wastewater infrastructure design and management.
2. Water Utility Managers: Responsible for operation, maintenance, and planning of WSS services.
3. Public Health Professionals: Concerned with water quality, sanitation, and disease prevention.
4. Urban Planners: Integrating WSS resilience into urban development strategies.
5. Environmental Scientists: Focusing on water resource management and pollution control.
6. Disaster Risk Reduction Specialists: Working on critical infrastructure protection.
7. Government Officials: From water, sanitation, and environmental agencies.
8. Development Practitioners: From NGOs and international organizations focused on WASH (Water, Sanitation, and Hygiene).

Course Duration

5 Days

Course Modules

Module 1: Understanding Vulnerabilities of Water Supply and Sanitation Systems

- Define water supply and sanitation (WSS) systems and their critical role.
- Identify major threats to WSS: climate change (droughts, floods), contamination, infrastructure failure, cyberattacks.
- Discuss the concept of WSS system vulnerability, exposure, and interdependencies.
- Explore cascading impacts of WSS disruptions on public health, economy, and society.
- Overview of global challenges and trends in WSS resilience.

Module 2: Resilience Assessment for WSS Infrastructure

- Learn methodologies for conducting resilience assessments specific to WSS systems.
- Identify critical WSS assets and their exposure to various hazards.
- Discuss data collection and analysis techniques for assessing physical and operational vulnerabilities.
- Explore the use of risk mapping and modeling tools for WSS.
- Apply resilience assessment frameworks to a hypothetical WSS network.

Module 3: Diversified Water Sources and Water Security

- Understand strategies for diversifying water supply sources (e.g., rainwater harvesting, greywater recycling).
- Explore desalination and advanced water treatment technologies for non-conventional sources.
- Discuss aquifer recharge and groundwater management for drought resilience.
- Learn about inter-basin transfers and regional water sharing agreements.
- Analyze the role of water conservation and demand management in enhancing security.

Module 4: Resilient Water and Wastewater Treatment

- Design for flood-resilient water and wastewater treatment plants.

- Implement strategies for power supply resilience in treatment facilities (e.g., renewable energy, backup generators).
- Discuss modular and decentralized treatment solutions for increased robustness.
- Explore advanced treatment technologies for emerging contaminants and extreme events.
- Understand the importance of operational flexibility and redundancy in treatment processes.

Module 5: Resilient Water Distribution and Collection Networks

- Develop strategies for resilient water distribution networks (e.g., pressure management, leak detection).
- Discuss adaptive design for wastewater collection systems to manage extreme rainfall.
- Explore smart network monitoring systems and real-time data analytics for anomaly detection.
- Understand the use of non-revenue water reduction techniques for resource efficiency.
- Implement asset management strategies for aging WSS infrastructure.

Module 6: Nature-Based Solutions (NbS) for WSS Resilience

- Explore the application of NbS for water quality improvement and flood mitigation (e.g., constructed wetlands, riparian buffers).
- Discuss green infrastructure for stormwater management and groundwater recharge.
- Understand the role of watershed protection and ecological restoration in water security.
- Learn about the co-benefits of NbS: biodiversity, recreation, carbon sequestration.
- Analyze case studies of NbS integrated into WSS planning.

Module 7: Emergency Preparedness and Response for WSS Disruptions

- Formulate emergency preparedness plans for WSS utilities (e.g., contamination, pipe breaks, power outages).
- Discuss rapid response protocols for restoring WSS services post-disaster.
- Learn about emergency water supply and sanitation provisions (e.g., mobile treatment units, emergency latrines).
- Understand communication strategies for public advisories during WSS disruptions.
- Explore the role of drills and exercises in enhancing WSS emergency readiness.

Module 8: Policy, Governance, and Financing for WSS Resilience

- Review national and local policies supporting WSS resilience and climate adaptation.
- Discuss institutional coordination and cross-sectoral collaboration for integrated WSS management.
- Explore innovative financing mechanisms for WSS resilience investments (e.g., green bonds, climate funds).
- Understand the role of regulations, standards, and performance-based contracts.
- Analyze the challenges of governance and capacity building in WSS resilience.

Training Methodology

- **Interactive Workshops:** Facilitated discussions, group exercises, and problem-solving activities.
- **Case Studies:** Real-world examples to illustrate successful community-based surveillance practices.
- **Role-Playing and Simulations:** Practice engaging communities in surveillance activities.
- **Expert Presentations:** Insights from experienced public health professionals and community leaders.
- **Group Projects:** Collaborative development of community surveillance plans.

- **Action Planning:** Development of personalized action plans for implementing community-based surveillance.
- **Digital Tools and Resources:** Utilization of online platforms for collaboration and learning.
- **Peer-to-Peer Learning:** Sharing experiences and insights on community engagement.
- **Post-Training Support:** Access to online forums, mentorship, and continued learning resources

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call +254769199797

Certification

Upon successful completion of this training, participants will be issued with a globally recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

- Participants must be conversant in English.
- Upon completion of training, participants will receive an Authorized Training Certificate.
- The course duration is flexible and can be modified to fit any number of days.
- Course fee includes facilitation, training materials, 2 coffee breaks, buffet lunch, and a Certificate upon successful completion.
- One-year post-training support, consultation, and coaching provided after the course.
- Payment should be made at least a week before the training commencement to Fineskill Training Center account, as indicated in the invoice, to enable better preparation.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com