Advanced Industrial Waste Management and Pollution Control Training Course



21 - 25 Dec 2026

Düsseldorf

5900 € (Per Person)

Ref: #SUS6373_141366

Course Introduction / Overview:

This comprehensive training course provides an in-depth exploration of the principles and practices of modern industrial waste management and pollution control. In an era of increasing environmental regulations and a global push towards sustainability, mastering these concepts is no longer optional but essential for industrial viability and corporate responsibility. The curriculum is designed to bridge the gap between theoretical knowledge and practical application, drawing on established frameworks and cutting-edge innovations. As discussed by authors like Mackenzie L. Davis in his seminal work, "Introduction to Environmental Engineering," a holistic understanding of waste streams, treatment technologies, and regulatory landscapes is critical. This program, offered by BIG BEN Training Center, delves into the entire lifecycle of industrial waste, from generation and characterization to treatment, disposal, and resource recovery. Participants will gain actionable insights into implementing waste minimization strategies, adopting circular economy principles, and ensuring full compliance with environmental standards. The course empowers professionals to develop and execute effective environmental management systems that not only mitigate pollution but also enhance operational efficiency and drive sustainable growth for their organizations.

Target Audience / This training course is suitable for:

- Environmental Engineers and Scientists.
- Health, Safety, and Environment (HSE) Managers and Officers.
- Plant and Operations Managers.
- Regulatory Compliance Specialists.
- Production and Process Engineers.
- Quality Control and Assurance Managers.
- Corporate Sustainability and CSR Professionals.
- Facility and Maintenance Supervisors.
- Industrial Hygienists and Technicians.
- Government Environmental Protection Agency Officials.

Target Sectors and Industries:

- Manufacturing and Production Sector.
- Oil and Gas Industry.
- Chemical and Petrochemical Processing.
- Pharmaceutical and Biotechnology Industries.
- Mining and Metals Sector.
- Power Generation and Utilities.
- Food and Beverage Processing.
- Textile and Apparel Manufacturing.
- Pulp and Paper Industry.
- Governmental bodies and regulatory agencies.

Target Organizations Departments:

- Environmental, Health, and Safety (EHS) Department.
- Operations and Production Department.
- Engineering and Maintenance Department.
- Regulatory Affairs and Compliance Department.
- Research and Development (R&D).
- Quality Assurance and Quality Control (QA/QC).
- Supply Chain and Logistics.
- Corporate Social Responsibility (CSR) and Sustainability.
- Facilities Management.

Course Offerings:

By the end of this course, the participants will have able to:

- Develop comprehensive industrial waste management plans.
- Characterize and classify different types of industrial and hazardous waste.
- Implement effective pollution prevention and waste minimization strategies.
- Select and design appropriate treatment technologies for industrial wastewater.
- Analyze and control air pollutant emissions from industrial sources.
- Navigate complex national and international environmental regulations.
- Conduct environmental impact assessments and risk analyses.
- Integrate circular economy principles into industrial operations.
- Manage solid and hazardous waste according to best practices.
- Establish robust environmental monitoring and reporting systems.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, engaging, and practical, ensuring that participants can immediately apply their learning in a real-world context. We move beyond traditional lectures by incorporating a dynamic blend of learning techniques. The course heavily features in-depth case studies of successful industrial waste management projects and pollution control failures, allowing for critical analysis and discussion. Participants will engage in collaborative group workshops to solve complex environmental challenges, fostering teamwork and diverse problem-solving skills. Interactive sessions, expert-led presentations, and Q&A panels provide a platform for deep dives into specific topics and clarification of complex regulatory requirements. Practical exercises, including waste stream auditing simulations and technology selection matrices, will be used to reinforce key concepts. Continuous feedback is a cornerstone of our approach, with instructors providing personalized guidance throughout the five-day program. This immersive and hands-on methodology ensures a comprehensive understanding of both the strategic and operational aspects of industrial environmental management.

Course Agenda (Course Units):

Unit One: Fundamentals of Industrial Pollution and Waste Management

- Introduction to Industrial Ecology and Environmental Systems.
- Sources and Characterization of Industrial Waste Streams.
- Principles of Pollution Prevention (P2) and Waste Minimization.
- The Role of Life Cycle Assessment (LCA) in Industry.
- National and International Environmental Regulatory Frameworks.
- Introduction to Environmental Management Systems (EMS) and ISO 14001.
- Health and Safety in Waste Management Operations.

Unit Two: Advanced Solid and Hazardous Waste Management

- Classification and Profiling of Hazardous Wastes.
- Techniques for On-site Storage, Handling, and Transportation.
- Physical, Chemical, and Biological Treatment Technologies.
- Thermal Treatment Processes including Incineration and Pyrolysis.
- Secure Landfill Design, Operation, and Monitoring.
- Resource Recovery and Waste Valorization Strategies.
- Managing Special Wastes like E-waste and Medical Waste.

Unit Three: Industrial Wastewater and Effluent Treatment

- Characterization of Industrial Wastewater and Key Pollutants.
- Primary, Secondary, and Tertiary Treatment Processes.
- Advanced Oxidation Processes (AOPs) for Recalcitrant Compounds.
- Membrane Technologies in Water Treatment and Reuse.
- Industrial Sludge Management, Treatment, and Disposal.
- Zero Liquid Discharge (ZLD) Concepts and Feasibility.
- Monitoring and Compliance for Effluent Discharge Standards.

Unit Four: Air Pollution Control and Emissions Management

- Major Industrial Air Pollutants and Their Sources.
- Air Dispersion Modeling and Impact Assessment.
- Control Technologies for Particulate Matter (PM).
- Control Technologies for Gaseous Pollutants (SOx, NOx, VOCs).
- Industrial Emissions Monitoring Systems (CEMS).
- Greenhouse Gas (GHG) Accounting and Carbon Footprint Reduction.
- Odor Control and Management Strategies.

Unit Five: Sustainability, Compliance, and Future Trends

- Integrating Circular Economy Principles in Industrial Processes.
- Conducting Environmental Audits and Site Assessments.
- Environmental Risk Assessment and Management.
- Corporate Environmental Responsibility and Reporting.
- Emerging Technologies in Waste Treatment and Pollution Control.
- Industrial Symbiosis and Waste-to-Energy (WtE) Systems.
- Developing and Implementing a Corporate Sustainability Strategy.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

As industries move towards a circular economy, what is the single most significant barrier to achieving zero-waste production, and how can it be overcome through policy versus technological innovation?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by offering a holistic and forward-thinking perspective that transcends basic compliance. While many programs focus solely on meeting existing regulations, this training course integrates the principles of sustainability, the circular economy, and industrial ecology into every module. We emphasize proactive pollution prevention and resource valorization over reactive end-of-pipe treatment. The curriculum is uniquely structured to balance deep technical knowledge of treatment technologies with the strategic skills needed for environmental management, such as conducting life cycle assessments and implementing ISO 14001. Participants will not just learn what the regulations are, but why they exist and how to build systems that are resilient to future regulatory changes. Our focus on practical case studies and simulation-based workshops ensures that learning is applied, enabling professionals to develop robust, cost-effective, and sustainable waste management solutions. The course fosters a mindset of environmental stewardship as a driver for innovation and competitive advantage, rather than simply a cost of doing business.