The Advanced Biological Wastewater Treatment Course: Principles, Modelling & Design

25 – 29 January 2027
Barcelona

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Ref: 26_40104 **Date:** 25 – 29 January 2027 **Location:** Barcelona **Fees:** 5700 Euro

The Advanced Biological Wastewater Treatment Course: Principles, Modelling & Design Overview:

Dive into a comprehensive journey through the intricate details of wastewater management with "The Advanced Biological Wastewater Treatment Course: Principles, Modelling & Design." This course is meticulously designed to address vital areas such as Biological Wastewater Treatment, Modelling Biofilms, and Advanced Wastewater Treatment Principles. Participants will delve into the complex worlds of Microbial Metabolism, Organic Matter Removal, and explore innovative strategies in Nitrogen Removal, Phosphorus Removal, and Pathogen Removal. Unveil the secrets behind effective Aeration and Mixing, and tackle challenges related to Toxicity in Wastewater Treatment, all while navigating through practical and theoretical aspects of Membrane Bio-reactors and Modelling Activated Sludge Processes.

Target Audience:

- Environmental Engineers
- Wastewater Treatment Plant Operators
- Environmental Consultants
- Municipal Water Authority Personnel
- Environmental Science Students and Academicians

Targeted Organizational Departments:

- Environmental Management
- Wastewater Treatment and Management
- Quality Control
- Health and Safety

Targeted Industries:

- Wastewater Treatment Plants
- Chemical Manufacturing Industries
- Pharmaceutical Companies
- Municipal Corporations
- Environmental Consulting Firms

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Course Offerings:

Participants will acquire skills and knowledge in:

- Utilizing advanced wastewater treatment principles
- Implementing effective wastewater treatment design
- Undertaking accurate wastewater characterization
- Engaging in sustainable and effective nitrogen and phosphorus removal strategies
- Employing strategies for effective pathogen removal and managing bulking sludge

Training Methodology:

Embracing a blend of theoretical knowledge and practical application, this course engages participants through interactive sessions, real-life case studies, and group work revolving around Advanced Wastewater Training topics like Modelling Biofilms and Anaerobic Wastewater Treatment. Experts in microbial metabolism and wastewater treatment design will guide through intricate concepts, ensuring a solid understanding of theory and its practical implementation in the wastewater treatment process. Moreover, hands-on experiences such as visits to wastewater treatment plants and interactive workshops will solidify learning and skills development.

Course Toolbox:

- Workbooks on Nitrogen Removal, Phosphorus Removal, and Anaerobic Wastewater Treatment
- Modelling Software for Wastewater Treatment Design
- Online resources for further reading on Biological Wastewater Treatment
- Checklists for Process Control in Wastewater Treatment
- Templates for implementing Modelling Activated Sludge Processes

Course Agenda:

Day 1: Understanding the Basics of Wastewater Treatment

- **Topic 1:** An Overview of Global Sanitation and Wastewater Treatment
- **Topic 2:** The History and Development of Wastewater Treatment
- **Topic 3:** Introduction to Wastewater Characteristics
- **Topic 4:** Significance of BOD and COD in Wastewater Analysis
- **Topic 5:** Microorganisms and Their Role in Treatment
- **Reflection & Review:** Analyzing the Progress and Evolution of Wastewater Management Globally

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Day 2: Exploring Microbial Metabolism and Organic Matter Removal

- **Topic 1:** Basics of Microbial Metabolism in Wastewater Treatment
- **Topic 2:** Diving into Stoichiometry and Energetics
- **Topic 3:** Understanding Organic Matter and its Removal
- **Topic 4:** Designing Activated Sludge System & Addressing Constraints
- **Topic 5:** Delving into Steady-State System Equations and Design
- **Reflection & Review:** Linking Microbial Activity with Organic Matter Removal

Day 3: Tackling Nitrogen and Phosphorus Removal

- **Topic 1:** Introduction to Nitrification and Its Biological Kinetics
- **Topic 2:** Designing Systems for Effective Nitrogen Removal
- **Topic 3:** Exploring Innovative Strategies for Nitrogen Elimination
- **Topic 4:** Understanding and Implementing Phosphorus Removal
- **Topic 5:** Mechanisms and Optimization of Enhanced Biological Phosphorus Removal EBPR Systems
- **Reflection & Review:** Understanding the Challenges and Solutions in Nutrient Removal

Day 4: Addressing Advanced Wastewater Treatment Techniques

- **Topic 1:** Ensuring Pathogen Removal and Ensuring Safe Water Release
- **Topic 2:** Key Concepts in Aeration and Mixing in Wastewater Treatment
- **Topic 3:** Managing Toxicity and Ensuring Non-Hazardous Effluent
- **Topic 4:** Addressing Challenges: Bulking Sludge and Filamentous Bacteria
- **Topic 5:** Exploring Membrane Bio-reactors and Their Applications
- **Reflection & Review:** Balancing Advanced Techniques to Achieve Optimal Treatment

Day 5: Integrating Modelling, Process Control, and Anaerobic Treatment

- **Topic 1:** Introduction to Modelling Activated Sludge Processes
- **Topic 2:** Why Modeling? Understanding the Basics and Importance
- **Topic 3:** Strategies and Importance of Process Control in Wastewater Treatment
- **Topic 4:** Exploring Anaerobic Wastewater Treatment and Sustainability
- **Topic 5:** Deep Dive: Microbiology and Kinetics of Anaerobic Conversions
- **Reflection & Review:** Connecting Theory to Practical Applications in Wastewater Treatment

How This Course is Different from Other Courses:

"The Advanced Biological Wastewater Treatment Course: Principles, Modelling & Design" offers an unparalleled deep-dive into the sophisticated realms of wastewater treatment, steering away from conventional approaches and embracing the latest innovations and strategies in Biological Wastewater Treatment and Design. From mastering the Microbial Metabolism and Wastewater Characterization to practically applying knowledge in Organic Matter, Nitrogen, and Phosphorus Removal, this course intertwines theory and practicality seamlessly. It not only addresses the theoretical aspects of wastewater treatment but also furnishes participants with a hands-on experience in navigating real-world challenges via in-depth modules on managing toxicity, Pathogen Removal, and employing cutting-edge technologies like Membrane Bio-reactors.