



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



**AGILE LEADERS**  
Training Center



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

### **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

## 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

### 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



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experience in navigating real-world challenges via in-depth modules on managing toxicity, Pathogen Removal, and employing cutting-edge technologies like Membrane Bio-reactors.

# WHO WE ARE

Agile Leaders is a renowned training center with a team of experienced experts in vocational training and development. With 20 years of industry experience, we are committed to helping executives and managers replace traditional practices with more effective and agile approaches.

## OUR VISION

We aspire to be the top choice training provider for organizations seeking to embrace agile business practices. As we progress towards our vision, our focus becomes increasingly customer-centric and agile.

## OUR MISSION

We are dedicated to developing value-adding, customer-centric agile training courses that deliver a clear return on investment. Guided by our core agile values, we ensure our training is actionable and impactful.

## WHAT DO WE OFFER

At Agile Leaders, we offer agile, bite-sized training courses that provide a real-life return on investment. Our courses focus on enhancing knowledge, improving skills, and changing attitudes. We achieve this through engaging and interactive training techniques, including Q&As, live discussions, games, and puzzles.



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## Gamified and Interactive Training

We understand that training delivery can be challenging, both online and offline. To ensure engagement and achieve learning objectives, we have developed our own activities and collaborated with industry-leading solutions to gamify our training sessions. This approach increases interaction levels and guarantees effective learning outcomes.



## Our Training Categories

We cover a wide range of training categories to cater to different needs and interests

- Branding, Marketing, Customer Relations, & Sales Programs
- Finance and Accounting Programs
- Human Resources Management Programs
- Management & Leadership Programs
- Political & Public Relations Programs
- Project Management Programs
- Quality & Process Management
- Self-Development Programs

Join Agile Leaders today and embark on a transformative journey towards becoming a more agile and effective leader. Experience our customer-centric approach, actionable training, and guaranteed return on investment. Let us help you unleash your full potential in the dynamic business landscape.



## Where to Find Us

You can join our training programs at our centers located in



We also offer online training sessions through the Zoom platform.

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Kuala Lumpur
- Morocco**  
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- Spain**  
Barcelona
- France**  
Paris
- UK**  
London
- Italy**  
Rome
- Egypt**  
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