



## **Online Course on Industrial Effluent Treatment**

The focus of this course is on management of industrial wastewater including topics such as cleaner production, industrial water management, toxicity, physical chemical processes, anaerobic industrial wastewater treatment, and sludge management and treatment.

### **For whom**

Mid-career professionals dealing with the technical, environmental, and management aspects pertaining to industrial pollution control, wastewater treatment, residuals/waste minimization, and disposal and reuse.

### **Fee**

Course fee: € 200

### **Learning objectives**

Upon completion, the participant should be able to:

1. Describe industrial water management strategies for pollution prevention including the planning and performance of water audits, the implementation of waste minimization plants, and the adequate selection of wastewater treatment technology
2. Implement industrial water management strategies for pollution prevention on a selected industrial sector
3. Define industrial effluent toxicity and identify problems associated with industrial effluent toxicity
4. Define the most commonly applied wastewater treatment technologies for industrial wastes and classify the technologies based on the conventional series of primary, secondary, tertiary, and in-plant treatment

### **Course structure**

Participants will receive training documentation once the alumn has enrolled into the course, and the course should be completed in two weeks with an extra period of week. The course will be a self –taught course will complete support from trainer during course period . A different number of assignments will be submitted ( 1 or 2 every week ) for completion. Upon successful completion of the course, participants will receive a Course Certificate .

### **Course content**

- Industrial Water Management: i) Impact of industry on water resources; ii) Industrial water quality; iii) Water audit; iv) Waste minimization; v) Treatment options; vi) Appropriate technology; and vii) Implementation.
- Toxicity in Industrial Wastewater: i) Measures of toxicity; ii) Kinetics Models for toxic substrates; and iii) Dealing with toxicity.

- Physical Chemical Processes: i) Contaminants/classes and process selection; ii) Physical-chemical transformation processes; iii) Physical-chemical separation processes; and iv) Coagulation/flocculation.
- Aerobic Industrial waste watertreatment.
- Anaerobic Industrial Wastewater Treatment: i) Anaerobic high-rate treatment of industrial wastewater; ii) UASB reactors; iii) EGSB reactors; iv) EGSB/IC reactors; and v) Industrial treatment examples.
- Sludge Management: i) Sludge conditioning; ii) Sludge thickening; iii) Sludge stabilization; and iv) Sludge dewatering.
- Case studies: i) Steel industry; ii) Tannery; iii) Aquaculture; iv) Industrial practices: potato, sugar, tannery, and yeast; v) Sugar, steel, and water reclamation; vi) Resources recovery; vii) Water management/water reuse (membrane bioreactors); viii) Refinery; ix) Leachate treatment; x) Metal surface protection by advanced wastewater treatment; xi) Brewery industry; xii) Sludge drying; and xiii) Sludge incineration.