Course Title: Operation of Wastewater Treatment Plants, Volume 2, Eighth Edition, Part A, "Treatment Plants and Tertiary Treatment" (OWTP2—A)

Course Hours: 35.5 hours, 3.5 CEUs

Course Description:

This course is designed to train operators in the practical aspects of operating and maintaining wastewater treatment plants, emphasizing safe practices and procedures using selected chapters from the training manual, "Operation of Wastewater Treatment Plants," Volume 2. Information is presented on wastewater as a resource and its components; nitrogen and phosphorous removal processes as well as enhanced biological control; and methods used to remove solids from effluent, including physical–chemical treatment and a variety of filtration methods.

Course Objectives:

Describe various types of pollutants found in wastewater and explain the reasons to prevent discharging them, including regulatory prohibitions.

Describe wastewater collection, conveyance, and treatment systems.

Draw schematic plan layouts of typical wastewater treatment plants and list the major wastewater treatment processes and the purpose of each process.

Identify various methods of effluent discharge, reclamation, and reuse, as well as solids handling, disposal, and reuse.

Recognize safety hazards and take steps to eliminate them by corrective action.

Explain nitrogen and phosphorous removal systems, including nitrification, denitrification, luxury uptake, lime precipitation, and enhanced biological treatment.

Describe the safety, sampling procedures, and process control strategies associated with nitrogen and phosphorous removal systems.

Outline abnormal operating conditions, their causes, and corrective actions.

Describe the proper procedures for using chemicals to remove solids from treatment plant secondary effluent.
Explain the operation of chemical feed equipment.
Identify and describe the components of gravity and pressure filters.
Explain the operation of membrane filters.

Course Outline:

1. Introduction to Wastewater Treatment (6.6 hours)
   1.1 Wastewater as a Resource
   1.2 Wastewater Components
   1.3 Clean Water Act
   1.4 Collection, Treatment, and Reuse Facilities
   1.5 Sampling and Laboratory Analysis

1.6 Electrical Power and Instrumentation Control
1.7 Maintenance Program
1.8 Safety Program

2. Nutrient Removal (Tertiary Treatment) (11.7 hours)
2.1 Nutrient Removal
2.2 Nitrogen Removal
2.3 Phosphorus Removal
2.4 Enhanced Biological Control

3. Solids Removal from Effluent (Tertiary Treatment) (17.2 hours)
3.1 Removing Solids From Secondary Effluents
3.2 Physical–Chemical Treatment
3.3 Conditioning
3.4 Gravity Filtration
3.5 Inert-Media Pressure Filters
3.6 Continuous Backwash, Upflow, Deep-Bed Silica Sand Media Filters
3.7 Membrane Filtration
3.8 Biological Aerated Filter

Course Format:
3.5

Assessment Methodology:
The course format uses chapter exams with best answer questions to assess each student's mastery of the course material.

Textbook:
Office of Water Programs (2022). *Operation of Wastewater Treatment Plants*, Volume 2, Eighth Edition. Sacramento, CA: Office of Water Program/University Enterprises, Inc.