

**Operation of Wastewater Treatment Plants, Volume 3**  
**California State University, Sacramento**  
**A—Treatment Plants, Effluent Discharge and Reuse, and Odor Control**  
**(2.3 Continuing Education Units)**

**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 3, 1<sup>st</sup> Edition*. Information is presented on wastewater as a resource and its components; treating and discharging effluent to receiving waters or for reuse in communities and industries; and identifying, preventing, and controlling odor from wastewater conveyance and treatment facilities.

**COURSE OUTLINE**

This course builds on the information offered in Volumes 1 and 2 to provide operators with the knowledge and skills to properly and safely operate, maintain, and inspect wastewater treatment plant systems.

**Chapter 1, Introduction to Wastewater Treatment**

*Learning Objectives*

1. Describe various types of pollutants found in wastewater and explain the reasons to prevent discharging them, including regulatory prohibitions.
2. Describe wastewater collection, conveyance, and treatment systems.
3. Draw schematic plan layouts of typical wastewater treatment plants and list the major wastewater treatment processes and the purpose of each process.
4. Identify various methods of effluent discharge, reclamation, and reuse, and solids handling, disposal, and reuse.
5. Describe the safety hazards found in wastewater treatment and conveyance facilities and the corrective steps that are taken to eliminate the hazards.

The main purposes of this chapter are to give an overview of wastewater and the operation and maintenance of wastewater treatment plants.

**Chapter 2, Effluent Discharge and Reuse**

*Learning Objectives*

1. Understand the role treated wastewater plays in the urban water cycle and water conservation and reuse.
2. Safely and properly collect and analyze samples to determine if treated wastewater meets regulatory or end use requirements.
3. Apply operational strategies to safely discharge treated wastewater to receiving waters or reuse treated wastewater for beneficial processes.

The main purpose of this chapter is to train operators in the basic operation and maintenance of effluent discharge and reuse processes at wastewater treatment plants.

**Chapter 3, Odor Control**

*Learning Objectives*

1. Describe odorous compounds and their sources in wastewater collection systems and treatment plants.
2. Classify and measure odor through sampling and assessment.
3. Protect public and operator health and prevent nuisance odors through effective source control and treatment methods.
4. Apply control and treatment techniques as part of a systemwide odor management program.

The main purpose of this chapter is to train operators in identifying, preventing, controlling, and treating odors generated by wastewater treatment and conveyance facilities.

## TIME ASSIGNMENT

**Text pages:** The content from the training manual used in this course, *Operation of Wastewater Treatment Plants*, Volume 3, includes 196 pages. The average word count on a page from the training manual is 525 words. The training manual used for this course contains text, tables, graphs, illustrations, math example problems, section questions, and chapter review questions to enhance the presentation of information and the student learning experience. The course is designed for students to spend the same amount of time reading the tables, graphs, and illustrations as they spend reading the equivalent amount of related chapter text. Therefore, each page is assumed to contain the equivalent of 525 words. The average reading speed is 130 words per minute; therefore, each page is projected to require 4 minutes of student time for each reading.

**Math example problems:** The course contains 3 math example problems. The projected average time to solve each math problem is 3 minutes.

**Section questions:** The course contains 138 section questions, located in the “Check Your Understanding” sections integrated throughout the chapter text. These questions enable students to self-assess their understanding of a section’s material before proceeding to the next section. The projected average response time is 2 minutes per question.

**Chapter review questions:** The course contains 85 review questions, located in the “Chapter Review” at the end of each chapter. Question types include fill-in, multiple choice, and matching. The projected average response time is 2 minutes per question.

**Objective test questions:** The course contains 85 test questions. There is 1 objective test per chapter. The projected average response time is 2 minutes per question.

Course component	Number of component units	Minutes required to complete component unit	Total time assignment for component
Text pages	196 ×	4 =	784
Math example problems	3 ×	3 =	9
Section questions	138 ×	2 =	276
Chapter review questions	85 ×	2 =	170
Objective test questions	85 ×	2 =	170
			<b>1,409 minutes</b>
			<b>23.5 hours or 24 hours</b>