

**702D SMALL WATER SYSTEMS: SAFETY AND INTRODUCTION
TO SMALL SYSTEM MANAGEMENT**
Office of Water Programs
California State University, Sacramento
(1.8 Continuing Education Units)

Course Description

Upon completion of this course, operators should be able to develop and implement a safety program for workers at water treatment and distribution facilities, understand and properly use safety equipment, institute safe practices around wells, treatment works, chemical processes, pumps, streets and trenches, confined spaces, and water storage facilities, practice lockout/tag out procedures, and conduct safety inspections. Upon completion of the second component of this course, operators should be able to develop water rates for a utility, determine revenue requirements, apply cost allocation methods, calculate distribution of costs to customers, design rates, administer rates and charges, and plan for financial stability 1.8 CEUs (18 contact hours).

Course Topic Outline

Safety Program	Developing Water Rates
Vehicle Safety	Revenue Requirements
Personal Safety	Cost Allocation Methods
Safety Around Wells	Distributing Costs to Customers
Pump Safety	Rate Design
Working in Streets	Administration of Rates and Charges
Working near Noise	Planning for Financial Stability
Safety Inspections	Emergency Response
Additional Resources	

Average word count: 520 words per screen

Average reading speed: 130 words per minute; 4 minutes per screen

The course is based on Chapter 5, "Safety", Chapter 7, "Introduction to Small System Management" and other sections from the related training manual. The course contains text, tables, graphs, illustrations, math example problems, 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 course text presented on screen.

Number of Moodle screens (internal): The course contains 43 Moodle learning management system screens.

Moodle screens consist of 1 home screen, 1 course instruction and help screen, 20 content screens, 3 glossary screens, 17 quiz screens, and 1 final exam screen.

Average reading speed: 1 minute per screen

The Moodle screens function as the "instructor" for the course, providing topic introduction, reading assignments, links to external web page resources, interactive student exercises, video clips, quizzes, a glossary and final exam. In this time assignment analysis, Moodle screens are distinguished from web page resource links for quantification purposes only. Students utilize internal Moodle screens and external web pages resource links seamlessly as they progress through the course.

Number of web page resource links (external): The course contains 222 web page resource links that students use extensively as an integral part of their training course. Examples of websites include the US EPA Public Drinking Water Systems Programs, the Groundwater Foundation, and the Nebraska Health and Human Services System. Each site contains a large number of internal and external web links that provide additional resources for students

Average reading time per web page resource link: 1 minute per link

Number of Interactive exercises: The course contains a total of 13 interactive exercises, including 7 general course content interactive exercises and 2 interactive math exercises. Each interactive math exercise can present an unlimited number of unique problems so students can attempt each exercise multiple times. For the purpose of this time assignment, it is assumed that students will attempt each of the 2 interactive math exercises three times, counting as 6 math exercises.

Average interactive exercise answer speed: 2 minutes per interactive exercise

Number of math example exercises: The course contains 8 small water system in-text math example exercises that support and expand the concepts presented in the online course text.

Average math example exercise answer speed: 3 minutes per math exercise

Number of chapter review questions: The course contains 95 review questions in the “Check your understanding” section at the end of each topic. Question types include fill-in and multiple choice.

Average chapter review question/answer speed: 2 minutes per question

Number of minutes of video: The course contains 55 minutes of video. Students are projected to watch one viewing.

Average video viewing time: 55 minutes

Final exam: The course contains 82 final exam questions. Question types include true/false; best answer (one correct answer); multiple choice (one or more correct answers); and math (requiring students to work through equations to find solutions).

Average final exam question/answer speed: 2 minutes per final exam question

The table summarizes the course components outlined above and shows the calculations for the total time assignment values in minutes and hours.

Time Assignment

Course component	Number of component units	Minutes required to complete component unit	Total time assignment for component
Text pages	158 ×	4 =	632
Web screens (internal)	43 ×	1 =	43
Web screens (external)	222 ×	1 =	222
Interactive exercises	13 ×	2 =	26
Math example exercises	8 ×	3 =	24
Chapter review questions	95 ×	2 =	190
Videos (minutes)	55 ×	1 =	55
Final exam questions	82 ×	2 =	164
			1,356 minutes
			22.6 hours