



## Water Treatment Review (16 hours) Course Syllabus

### Purpose

This course covers information relevant to water treatment operators and is designed to be used for continuing education.

### Topics

Source Water  
Coagulation and Flocculation  
Sedimentation  
Filtration  
Disinfection  
Corrosion Control  
Fluoridation  
Iron and Manganese Control  
Lime Softening  
Regulations  
Membrane Technology

### CEUs (Contact Hours)

Upon completion of this course, you will receive a certificate for 1.6 CEUs (16 contact hours).

### Completion Requirements

In order to receive [IACET CEU](#) credit for this course, you must complete the following:

- Complete each individual lesson module by watching the video lecture, completing the lesson handout, and passing the lesson quiz.

Once you have completed all of these elements, your course completion certificate will be automatically placed into your learning account for printing/downloading. It will remain in your learning account even after your course access has expired.

### Learning Objectives

#### Source Water Review

Upon completion of this lesson the student will be able to:

- Define source water vocabulary
- Discuss proper water source evaluation
- Recall the different types of source water contaminants
- Explain the hydrologic cycle
- Distinguish the different types of public water systems
- Describe the main objectives of water treatment
- Formulate solutions to water quality problems

### Coagulation and Flocculation Review

Upon completion of this lesson the student will be able to:

- Define coagulation and flocculation vocabulary words
- Discuss what is considered “Conventional Treatment”
- Express coagulation chemistry basics
- Discuss the purpose of flash mixers and define the different types of flash mixers
- Recall how a Streaming Current Meter operates
- Discuss the principles of enhanced coagulation
- Apply jar testing principles
- Relate what operator actions are taken during changing plant conditions

### Sedimentation Review

Upon completion of this lesson the student will be able to:

- Define sedimentation vocabulary words
- Recall the size ranges for various particles
- Describe the different sedimentation zones
- Identify the different types of sedimentation basins
- Analyze the expected performance of the sedimentation process
- Relate what operator actions are taken during changing plant conditions

### Filtration Review

Upon completion of this lesson the student will be able to:

- Define filtration vocabulary
- Recall the factors that affect the filtration process
- Describe the different filtering mechanisms
- Identify the different types of filters
- Describe how filter media is classified
- Relate the required removal for viruses and Giardia
- Discuss the instrumentation used to monitor filters

### Disinfection Review

Upon completion of this lesson the student will be able to:

- Define disinfection vocabulary
- Recall the factors influencing disinfection
- Describe the agents of disinfection
- Identify the properties of chlorine gas
- Describe the relationship between pH and chlorine species
- Describe breakpoint chlorination
- Discuss the pros and cons of alternative disinfectants
- Relate chlorine safety principles

### Corrosion Control Review

Upon completion of this lesson the student will be able to:

- Define corrosion control vocabulary
- Recall the factors affecting corrosion
- Describe the tools used to control corrosion

- Identify the LCR (Lead and Copper Rule) requirements

### Fluoridation

Upon completion of this lesson the student will be able to:

- Define fluoridation vocabulary
- Recall fluoride chemicals
- Recall the regulations related to fluoridation
- Describe good fluoride process operation practices
- Describe the tests associated with fluoridation
- Recall key safety info associated with fluoridation

### Iron and Manganese Control

Upon completion of this lesson the student will be able to:

- Define iron and manganese control vocabulary
- Describe the problems caused by excessive iron and manganese
- Describe the methods used for iron and manganese removal
- Describe the equipment used for iron and manganese removal
- Recall the regulations that apply to iron and manganese in drinking water
- Describe monitoring and operations of iron and manganese removal processes

### Lime Softening

Upon completion of this lesson the student will be able to:

- Describe the effects of hard and soft water
- Describe the minerals causing water hardness
- Recall the various types of water hardness
- Recall the regulations that may affect the softening process
- Describe how softening chemical are properly stored and fed
- Describe how softening facilities are operated
- Recall tests used for operational control of the softening process

### Regulations Review

Upon completion of this lesson the student will be able to:

- Define regulation vocabulary
- Describe and identify each of the following rules/regulations
- Safe Drinking Water Act (SDWA)
- Surface Water Treatment Rule (SWTR)
- Total Coliform Rule (TCR)
- Lead and Copper Rule (LCR)
- Stage 1 Disinfection by Product Rule (DBP)
- Interim Enhanced Surface Water Treatment Rule (IESWTR)
- Long Term 2 Surface Water Treatment Rule (LT2SWTR)
- Stage 2 Disinfection by Products Rule (DBP)

## Membrane Technology

Upon completion of this lesson the student will be able to:

- Describe the types of membrane processes
- Recall the principles of microfiltration, nanofiltration, and reverse osmosis
- Describe the equipment used
- Describe the operations of a membrane system

### **Support**

Students can contact our student support staff with any course-related, content-related, or technology-related inquiries.

Our office hours are Monday-Thursday, 9-5 CT, and Friday 9-12 CT.

### **Contact Info**

Phone Number: (661) 874-1655

General Course Inquiries: [Info@americanwatercollege.org](mailto:Info@americanwatercollege.org)

