Collection System
Exam Preparation Grade 4
Course Syllabus

Purpose
This course is designed to prepare you for your Manager Level Collection System Operator exam.

Topics
Collection System Design and Layout
Collection Equipment Maintenance
Collection System Maintenance and Repair
Lift Stations
Collection System Testing and Inspections
Collection System Rehabilitation
Collection System Safety
Trenching and Excavation
Traffic Control
Unit Conversions
Using Formulas
Understanding Percentages
Area Calculations
Volume Calculations
Velocity and Flow Rate
Force-Pressure-Head Calculations
Pump Calculations
Unit Conversions
Working with Formulas
Understanding Percentages
Calculating Area
Calculating Volume
Weight-Volume Relationships
Force-Pressure-Head
Velocity and Flow Rate
Pumps
The Metric System
Problem Solving

CEUs (Contact Hours)
Upon completion of this course, you will receive a certificate for 2.0 CEUs (20 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

Collection System Design and Layout

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

- Demonstrate understanding of collection system vocabulary
- Demonstrate understanding of collection system design criteria
- Demonstrate understanding of the function of collection system components
- Demonstrate how to estimate flow velocity within a sewer

Collection Equipment Maintenance

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

- Demonstrate understanding of vocabulary associated with collection system equipment maintenance
- Demonstrate understanding of the components and tools used to perform electrical maintenance
- Demonstrate understanding of causes of motor failure
- Demonstrate understanding of centrifugal pump components and operation
- Demonstrate understanding of the purpose of lubrication

Collection System Maintenance and Repair

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

- Demonstrate understanding of System Maintenance and Repair vocabulary
- Demonstrate understanding of System Maintenance and Repair techniques
- Demonstrate proper operation of clearing and cleaning equipment
- Demonstrate proper sewer line repair procedures

Lift Stations

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

- Demonstrate understanding of Lift Station vocabulary
- Demonstrate understanding of Lift Station components and their function
- Demonstrate understanding of Lift Station operational requirements
- Demonstrate understanding of Lift Station maintenance requirements

Collection System Testing and Inspections

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

- Demonstrate understanding of the purpose of sewer system inspections for operational and maintenance problems
- Demonstrate understanding of procedures for inspecting manholes
- Demonstrate understanding of procedures for closed circuit television inspections of sewer systems
- Demonstrate understanding of Smoke testing procedures
- Demonstrate understanding of Dye testing procedures

Collection System Rehabilitation

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

- Demonstrate understanding of Piping
- Demonstrate understanding of Service connections
- Demonstrate understanding of Manholes

Collection System Safety

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

- Demonstrate understanding of Safety related terminology
- Demonstrate understanding of Trenching safety requirements
- Demonstrate understanding of Confined space safety requirements
- Demonstrate understanding of Lockout/Tagout requirements
- Demonstrate understanding of Traffic diversion procedures
- Demonstrate understanding of Electrical Safety procedures

Trenching and Excavation

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

- Explain proper safety precautions
- Identify key concepts related to planning and execution of Trenching projects
- Identify key concepts related to planning and execution of Excavation projects

Traffic Control

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

- Explain proper safety precautions
- Explain standard traffic control measures

Unit Conversions

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

- Define what a unit is
- Define what an equivalent is
- Demonstrate how units and equivalents are used to solve math problems

Using Formulas

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

- Define what a formula is
- Demonstrate how a formula is used.
- Demonstrate how formulas are rearranged
- Demonstrate how to solve math problems using formulas

Understanding Percentages

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

- Demonstrate how to convert between fractions and percentages
- Demonstrate how to convert between decimals and percentages

Area Calculations

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

- Demonstrate how to solve for the area of a square
- Demonstrate how to solve for the area of a rectangle
- Demonstrate how to solve for the area of a circle
- Demonstrate how to solve for the area of a triangle

Volume Calculations

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

- Demonstrate how to solve for the area of a square
- Demonstrate how to solve for the area of a rectangle
- Demonstrate how to solve for the area of a circle
- Demonstrate how to solve for the area of a triangle

Velocity and Flow Rate

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

- Define velocity
- Demonstrate how velocity is calculated
- Define flow rate
- Demonstrate how flow rate is calculated

Force-Pressure-Head Calculations

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

- Define force
- Define pressure
- Define water head
- Recall how many psi (pounds per square inch) is one foot of water head
- Discuss and demonstrate how to solve math problems involving force-pressure-head calculations

Pump Calculations

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

- Define horsepower
- Define water horsepower
- Define break horsepower
- Define motor horsepower
- Discuss and demonstrate how to solve pump math problems involving horsepower

Other collection system math topics

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

- Solve math problems that are common for collection system operators

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 PST, and Friday 9-12 PST.

Contact Info
Phone Number: (661) 874-1655
General Course Inquiries: Info@americanwatercollege.org