Ohio Wastewater Treatment
Exam Review – Class IV
Course Syllabus

Purpose

This course is designed to prepare you for your manager level wastewater treatment operator exams.

Topics

Basic Water Math
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

Math and Treatment Review
Wastewater Flow Problems
Characterization of Wastewater
Sampling Wastewater
Preliminary Treatment
Grit Channel Problems
Primary Treatment
Clarifier Problems
Pond Treatment
Pond Problems
Activated Sludge Review
Activated Sludge Problems
Trickling Filter Review
Trickling Filter Problems
Rotating Biological Contactors
Wastewater Disinfection Review
Wastewater Disinfection Problems
Sludge Thickening Review
Anaerobic Sludge Digestion
Anaerobic Sludge Problems
Sludge Dewatering Review
Advanced Activated Sludge Review
Advanced Activated Sludge Problems
Nutrient Removal
Odor Control
Pumps and Motors
Safety
Management Concepts
Advanced Wastewater Math

CEUs (Contact Hours)

Upon completion of this course, you will receive a certificate for 6.2 CEUs (62 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

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

Working with 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

Calculating Area

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

Calculating Volume

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

- Demonstrate how to solve for the volume of a cube
- Demonstrate how to solve for the volume of a cylinder
- Demonstrate how to solve for the volume of a cone
- Demonstrate how to solve for the volume of a sphere

Weight/Volume Relationships

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

- Recall how many pounds one gallon of water weighs
- Recall how many gallons are in one cubic foot
- Recall how many pounds one cubic foot of water weighs
- Recall how many liters are in one gallon
- Recall how many pounds are in one kilogram
- Discuss and demonstrate how these weight and volume relationships are used to solve math problems

Force-Pressure-Head

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

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

Pumps

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

The Metric System

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

- Define what metric system units
- Demonstrate how to convert between weight and volume measurements in the metric system
- Demonstrate how to convert between metric units and standard units

Problem Solving

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

- Define the five steps to problem solving
- Determine if all five steps are needed to solve a specific problem
- Explain how the five steps work
- Apply the five step problem solving method to water math problems

Wastewater Flow Problems

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

- Demonstrate how to convert between MGD and gpm
- Demonstrate how to convert between MGD and CFS

Preliminary Treatment

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

- Define preliminary treatment vocabulary words

- Discuss what the purpose of preliminary treatment is
- Express preliminary treatment components
- Discuss the benefits of pre-aeration of wastewater

Grit Channel Problems

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

- Define what a grit channel is
- Explain what a grit channel does
- Demonstrate how to solve velocity problems
- Demonstrate how to solve removal problems
- Define the units used in grit channel problems

Primary Treatment

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

- Define primary treatment vocabulary words
- Discuss the purpose of primary treatment
- Discuss the components of primary treatment and how they operate
- Recall safety associated with the primary treatment

Clarifier Problems

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

- Define what a clarifier is
- Explain what a clarifier does
- Demonstrate how solve detention time problems
- Demonstrate how to solve surfacing loading problems
- Demonstrate how to solve weir overflow problems
- Demonstrate how to solve solids loading problems
- Define what units are used in each of the above listed problem types

Pond Treatment

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

- Define pond treatment vocabulary words
- Discuss the purpose of pond treatment
- Express what is involved in the pond treatment process
- Discuss the classification of waste treatment ponds
- Recall the advantages and disadvantages of pond treatment

Pond Problems

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

- Demonstrate how to solve detention time problems
- Demonstrate how to solve population loading problems
- Demonstrate how to solve hydraulic loading problems
- Demonstrate how to solve organic loading problems
- Define what units are used in solving pond problems

Disinfection Review

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

- Define disinfection vocabulary words
- Discuss the purpose of disinfection
- Discuss breakpoint chlorination
- Identify the hazards of chlorine
- Discuss safe handling practices of chlorine

Disinfection Problems

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

- Demonstrate how to solve residual problems
- Demonstrate how to solve chlorinator setting problems

Anaerobic Sludge Digestion

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

- Define anaerobic sludge digestion vocabulary words
- Discuss how to control the sludge digestion process
- Recall the normal operating parameters of a healthy digester
- Discuss how to identify and correct an “upset” or “sour” digester

Anaerobic Sludge Digestion Problems

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

- Demonstrate how to solve digester seeding problems
- Demonstrate how to solve sour digester neutralizing problems
- Demonstrate how to solve sludge pumping and handling problems
- Demonstrate how to solve digester loading problems
- Demonstrate how to solve solids reduction problems
- Demonstrate how to solve digester gas production problems
- Define the units used in each of the above problem types

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