

**SOUTHEAST COMMUNITY COLLEGE**  
**CONSTRUCTION, MANUFACTURING AND TECHNOLOGY DIVISION**  
**Energy Generation Operations Technology Program**  
**Revision Date: August 24, 2020**  
[Syllabus Statements](#)

**I. CATALOG DESCRIPTION**

Course Number: ENER2555  
Course Title: Introduction to Drinking Water Treatment  
Prerequisite(s): None  
Catalog Description: This course is the preparation for the student to pass the state certification examination for Water Treatment Plant Operator C. Drinking water processes and laws are covered as well as a review of necessary topics associated with drinking water treatment in order to prepare the student for obtaining a job in the industrial or municipal water treatment industry. Case studies, process flows and problem solving, workshops, types of water treatment facilities are presented during the course.  
Credit Hours: 3.0  
Class Hours: 45  
Lab Hours: 0  
Total Contact Hours: 45

**II. COURSE OBJECTIVES: *Course will:***

- A. Teach the basics of water treatment process control; as related to the science and mathematical basis
- B. Provide an understanding of biology and chemistry of water treatment
- C. Describe the types of water treatment facilities
- D. Discuss maintenance and instrumentation of the water treatment plant
- E. Explain waste disposal in a drinking water system
- F. Explain disinfection of drinking water

**III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:**

- A. Student Learning Outcomes: *Student will be able to:*
  - 1. To explain the type of work that drinking water treatment plant operators perform
  - 2. To describe properties of raw natural water utilized for drinking water production
  - 3. To describe surface water treatment processes
  - 4. To explain the purposes of coagulation, flocculation, sedimentation, and filtration in the treatment of raw water
  - 5. To explain the principles of drinking water chlorination and disinfection
  - 6. To understand the processes associated in corrosion and in corrosion control
  - 7. To describe processes involved in taste and odor control
  - 8. To outline processes involved in iron and manganese control
  - 9. To describe water softening treatment utilizing lime softening and ion exchange
  - 10. To describe treatment processes that mitigate the development of disinfection byproducts.  
To explain the processes involved in demineralization of raw water.
  - 11. To develop a plant safety program
  - 12. To develop a plant maintenance program
  - 13. To apply laboratory and chemical analysis for process control in the treatment of drinking water
  - 14. To analyze, collect and present drinking water data in process control and record keeping
- B. General Education Learning Outcomes (GELOs)
  - 1. GELO #3: Critical Thinking & Problem Solving  
Outcome 1: Collect, identify, interpret and analyze data.

- Outcome 2: Synthesize information to arrive at reasoned solutions to problems.
- Outcome 3: Evaluate ideas presented in writing, medial, speech, or artistic presentations.
- Outcome 4: Evaluate the validity of arguments, alternatives, data, outcomes, and/or impacts of actions.
- Outcome 5: Acquire and integrate knowledge and construct relationships across disciplines.

#### **IV. CONTENT/TOPICAL OUTLINE**

- A. Review of Microbiology and Basic Chemistry
- B. Math for water treatment
- C. Water Quality Regulations Overview
- D. Water Sources and Treatment Options
- E. Groundwater Quality and Wells
- F. Surface Water Source Treatment
- G. Treatment Plant Pretreatment
- H. Coagulation and Flocculation
- I. Sedimentation and Clarifiers
- J. Filtration Fundamentals
- K. Disinfection
- L. Intro to Iron and Manganese Treatment
- M. Fluoridation
- N. Water Quality Testing
- O. Corrosion Control
- P. Lime Softening Basics
- Q. Intro to Specialized Treatment Processes
- R. Intro to Electrical Systems in Water Treatment Plants
- S. Pumps Review
- T. Safety in Water Treatment Plants
- U. Administration of Water Treatment Plants

#### **V. INSTRUCTIONAL MATERIALS**

- A. Water Treatment Grade 1, ISBN: 9781625761231
- B. Water Treatment Grade 2, ISBN: 9781625761248

#### **VI. METHODS OF PRESENTATION/INSTRUCTION**

- A. Methods of presentation typically include a combination of the following:
  1. Online Delivery

#### **VII. METHODS OF EVALUATION**

- A. Methods of evaluations, although determined by the individual instructor, traditionally includes a combination of the following:
  1. Class participation, discussions
  2. Regular assignments
  3. Written exams and/or quizzes

#### **VIII. SPECIFIC COURSE REQUIREMENTS**

- A. A minimum grade of “C” or 70% is required.
- B. Cheating within the Construction and Electronics Division: Any violation of academic integrity on assignments, quizzes, or tests will result in a grade of 0 on that assignment, quiz or test. A second violation in any course after the initial infraction will result in a grade of F for that course. Any additional violations while in the program will result in a suspension from the program.
- C. Credit by Examination: Credit for the course CANNOT be earned through Credit by Examination.