SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION, MANUFACTURING AND TECHNOLOGY DIVISION
Energy Generation Operations Technology Program
Revision Date: August 24, 2020

I. CATALOG DESCRIPTION

Course Number:	ENER2550
Course Title:	Introduction to Wastewater
Prerequisite(s):	None
Catalog Description:	This course examines the mathematical, chemical, physical and biological treatment of wastewater. It emphasizes unit operations and analysis of wastewater treatment systems, and the field evaluation of their operation.
Credit Hours:	3.0
Class Hours:	45
Lab Hours:	0
Total Contact Hours:	45

II. COURSE OBJECTIVES: *Course will:*

A. Provide an understanding of our waters, wastewaters and the impact of the urban society.
B. The basics of water and wastewater treatment process control; as related to the science and mathematical basis.
C. Biology of wastewater treatment and aquatic environments.
D. The chemistry of wastewater treatment and aquatic environments.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

A. Student Learning Outcomes: *Student will be able to:*
1. Explain water sources and treatment
2. Describe reservoir management and intake structures-physical and biological properties of water
3. Explain coagulation and flocculation, charge chemistry associated with water
4. Outline laboratory procedures associated with water treatment, operational analysis of water treatment
5. Utilize biological principles in the treatment of water and in the disinfection of treated water
6. Utilize and describe mathematically systems that monitor water treatment processes
7. Utilize and describe mathematically systems that monitor wastewater treatment processes
8. Utilize formulas and applications from geometry and to incorporate them into the process control of water and wastewater treatment
9. Describe wastewater treatment facilities
10. Explain the function of racks, screens, comminutors and grit removal systems, physical properties of wastewater
11. Explain sedimentation and flotation, physical and biological properties of wastewater
12. Describe the biological treatment of wastewater
13. Apply laboratory and chemical analysis for process control in the treatment of wastewater
14. Describe the impact of effluent disposal on natural environmental systems, biological and chemical properties of wastewater

B. General Education Learning Outcomes (GELOs)
1. GELO #3: Critical Thinking & Problem Solving
Outcome 1: Collect, identify, interpret and analyze date.
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.** Introduction to Wastewater Treatment
- **B.** Wastewater Characteristics
- **C.** Preliminary Treatment of Wastewater
- **D.** Primary Treatment of Wastewater
- **E.** Fundamentals of Biological Treatment
- **F.** Wastewater Treatment Ponds
- **G.** Fixed-Film Treatment
- **H.** Activated Sludge
- **I.** Nutrient Removal
- **J.** Disinfection

V. INSTRUCTIONAL MATERIALS

- **A.** Operation of Water Resource Recovery Facilities, MOP11, ISBN: 9781259859366
- **B.** Operation of Water Resource Recovery Facilities, Study Guide, ISBN: 9781572783386

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.