SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION, MANUFACTURING AND TECHNOLOGY DIVISION
Energy Generation Operations Technology Program
Revision Date: August 21, 2023

I. CATALOG DESCRIPTION

Course Number:	ENER2530
Course Title:	Process Plant Chemistry
Prerequisite(s):	None
Catalog Description:	Introduces students to the science of chemistry and how it relates to process plant operations. Basic concepts of chemistry will be covered including atomic structure, chemical bonding, chemical reactions, water chemistry, pH, oxidation-reduction reactions, chemical calculations, properties of gases and liquids, biochemistry and topics specifically related to process operations such as corrosion, scaling, reverse osmosis and ion exchange.
Credit Hours:	2
Class Hours:	23
Lab Hours:	23
Total Contact Hours:	46

II. COURSE OBJECTIVES: *Course will:*

A. Demonstrate basic chemistry concepts and principles.
B. Explain how basic chemical concepts apply to processing plant operations.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

A. Student Learning Outcomes: *Student will be able to:*
- **1.** Demonstrate an understanding of the following chemical concepts:
  - **a.** Basic atomic structure
  - **b.** Periodic Table
  - **c.** Chemical bonding
  - **d.** Water chemistry, including pH
  - **e.** Oxidation-Reduction reactions
  - **f.** Gas and liquid properties
  - **g.** Chemical calculations
  - **h.** Basic biochemistry and organic chemistry

B. General Education Learning Outcomes (GELOs)
- **1.** GELO #5: Analytical, Quantitative, and Scientific Reasoning
  Outcome 1: Apply mathematical and scientific methods to solve problems from an array of contexts and everyday situations.

IV. CONTENT/TOPICAL OUTLINE

A. Basic Chemistry
B. The chemistry of Water
C. Chemical calculations
D. Gas and liquid properties
E. Basic Biochemistry
F. Practical applications of chemistry in processing plant applications

V. INSTRUCTIONAL MATERIALS

A. Required Text(s): Bishop, *An Introduction to Chemistry,* (Refer to CID and/or instructor for current edition)

B. Other Resources: Various instructor-provided resources

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:

1. On-line or face-to-face lecture
2. On-line homework and quizzes
3. Discussion
4. In-class group activities/problem-solving exercises
5. Laboratory exercises.

VII. METHODS OF EVALUATION

A. Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:

1. Class participation
2. Regular assignments
3. Written exams and/or quizzes
4. Performance and observational assessments

VIII. SPECIFIC COURSE REQUIREMENTS

A. A minimum grade of "C" or 70% is required to receive credit for this course.

B. A minimum grade of "B" or 80% is required to achieve the NUCP certificate, in accordance with ACAD 08-006, Revision 1, dated October 2016.

C. Cheating within the Manufacturing 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.

D. Credit by Examination: Credit for the course CANNOT be earned through Credit by Examination.