

SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Land Surveying/GIS/Civil Engineering Technology Program
Revision Date: August 26, 2019

I. CATALOG DESCRIPTION

Course Number: LSCE1324
Course Title: Concrete Inspection
Prerequisite(s): None
Catalog Description: Study based on the fundamental principles of cement and concrete. Understanding cement, concrete, and concrete products as applied to the job. Reasons behind the “why” of cement and concrete. Study of ingredients, placement, and other factors, which affect the quality of pavement and structures. Role of the inspector in maintaining quality control of concrete construction projects. Includes Concrete Field Testing Technician Grade 1 Certification through the American Concrete Institute.
Credit Hours: 3
Class Hours: 45
Lab Hours: 0
Total Contact Hours: 45

II. COURSE OBJECTIVES: *Course will:*

- A. Identify the main purpose of concrete industry and standards organizations.
- B. Discuss the purpose of various concrete quality tests.
- C. Prepare students for the ACI Field Testing Technician Grade 1 examination and certification.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Pass the hands-on examination for the seven ASTM tests for quality concrete.
 - 2. Pass the written test for the seven ASTM standards for quality concrete.
 - 3. Describe the standards of quality concrete.
 - 4. Practice good safety habits when working with concrete.
 - 5. Describe how impurities in mixing water affect concrete.
 - 6. Describe variables that influence quality concrete.
- B. General Education Learning Outcomes (GELOs)
 - 1. GELO #3: Critical Thinking & Problem Solving
Outcome 1: Collect, identify, interpret and analyze data.

IV. COURSE CONTENT/UNITS OF INSTRUCTION

- A. Job Opportunities in the Concrete Industry & Getting Acquainted with Concrete
- B. Uses of Concrete & Portland Cement
- C. Mixing Water for Concrete & Aggregates for Concrete
- D. Air-Entrained Concrete & Selection & Design of Concrete Mixtures
- E. Ready-Mixed Concrete & Sampling & Testing Plastic Concrete
- F. Job Mixed Concrete, Tools for Placing & Finishing Concrete Slabs & Placing Concrete
- G. ACI Certification for Concrete Field Testing Technician Grade I
 - 1. ASTM C1064 - Temperature of Freshly Mixed Hydraulic-Cement Concrete
 - 2. ASTM C172 – Sampling Freshly Mixed Concrete

3. ASTM C143 – Slump of Hydraulic-Cement Concrete
4. ASTM C138 – Density, Yield, and Air Content (Gravimetric) of Concrete
5. ASTM C231 – Air Content of Freshly Mixed Concrete by the Pressure Method
6. ASTM C173 – Air Content of Freshly Mixed Concrete by the Volumetric Method
7. ASTM C31 – Making and Curing Concrete Test Specimens in the Field

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s): Fahl, *Concrete Principles*, (2009), American Technical Publications
- B. Other Text (s): Kosmatka and Panarese, *Design and Control of Concrete Mixtures*, 13th Edition (1994), Portland Cement Association, ACI International, *Concrete Field Testing Technician – Grade 1 Workbook, Publication CP-1 (99)*, 17th Edition (2010), ACI Certification Programs Committee

VI. METHODS OF PRESENTATION/INSTRUCTION

- A. Methods of presentation typically include a combination of the following:
 1. Lectures
 2. Classroom demonstrations
 3. Classroom discussions
 4. Hands-on lab projects
 5. Lab demonstrations
 6. Lab assistance
 7. Instructional handouts
 8. Video presentations
 9. PowerPoint presentations
 10. Speaker(s)
 11. Field Trip(s)

VII. METHODS OF EVALUATION

- A. Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
 1. Assignment Sheets
 2. Tests
 3. Participation

VIII. SPECIFIC COURSE REQUIREMENTS

- A. A minimum grade of “C” or higher is required in all courses designated or starting with LSCE to progress through or graduate from the program.
- B. At the end of the course the students will take the “Concrete Field Testing Technician Grade 1” examination that includes a test and hands-on examination of the seven (7) tests for quality concrete. This test has been developed for the purpose of certifying concrete technicians who demonstrate the knowledge and ability to properly perform the basic field tests on freshly mixed concrete. The cost of the test will be determined by the Nebraska Chapter of the American Concrete Institute and discriminated to the students.