

SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Building Construction Technology Program
Revision Date: September 5th, 2025

I. CATALOG DESCRIPTION

Course Number: CNST1120
Course Title: Concrete and Masonry: Tools and Materials
Prerequisite(s): None
Catalog Description: Introduce students to materials and techniques for planning, and constructing masonry and concrete structures including flatwork, foundations, and walls. Demonstrations and hand-on application of construction procedures for concrete and masonry project emphasizing the best practices in concrete and form work
Credit Hours: 4.5
Class Hours: 30
Lab Hours: 113
Total Contact Hours: 143

II. COURSE OBJECTIVES: *Course will:*

- A. Select proper quantities and kinds of ingredients for admixtures as required by ASTM standards for various applications using manufacturer's charts and information
- B. Determine the type of concrete to use for a job and how to estimate the proper amount
- C. Select and estimate proper reinforcement for all concrete jobs related to residential and light commercial buildings
- D. Introduce the procedures to place, finish, and cure concrete to insure required strength and properties of hardened concrete
- E. Identify and select the proper mortar type to meet specs for laying block, brick, and stone products
- F. Identify concrete, block, and brick
- G. Identify the clay products as to size and use
- H. Become familiar with different types of quarried, mined, and stones for use in veneers and masonry structures
- I. Become familiar with manufacturing of block and clay brick
- J. Select and estimate block for the required construction use
- K. Identify the various wall types and determine size and grade brick for each wall design
- L. Select material required to build various masonry structures
- M. Know when to use each type of metal ties with specified product and structure
- N. Introduce care and maintenance procedures of masonry walls
- O. Select and identify bond and joint according to code and blueprint
- P. Learn proper safety procedures, clothing, and equipment
- Q. Properly construct masonry projects in accordance to handout requirements.
- R. Select, place, finish, and reinforce concrete for sidewalks, slabs, and footings.
- S. Simulate on-the-job training in masonry and concrete construction.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. *Select the right* type of Portland Cement and judge the proper usage of these materials for various types of concrete work.

2. Identify the use and care of all concrete tools and equipment.
3. Identify concrete, block and brick.
4. Identify and select the proper mortar type to meet specs for laying block, brick, and stone products.
5. Identify reinforcing and anchoring systems for masonry structures
6. Identify and differentiate masonry wall systems
7. Demonstrate placement of masonry materials and construction of masonry wall systems to industry standards.
8. Reinforce, place, and finish concrete in common construction projects.

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.
2. GELO #3: Critical Thinking & Problem Solving
Outcome 1: Collect, identify, interpret and analyze data.

IV. CONTENT/TOPICAL OUTLINE (*course outline may provide more detailed information*)

- A. Portland Cement
 1. origin, ingredients, types – lime, masonry, pozzolans
- B. Admixtures for concrete
 1. air entrainment, coloring, protex, accelerators, retarders, plasticizers
- C. Concrete design mixtures
 1. use, type of cement, water/cement ratio, weight proportions, volume proportions
- D. Aggregates for concrete
 1. gravel, sand, limestone, gradation, fineness of modules
- E. Concrete uses
 1. light weight, normal weight, heavy weight, insulating, architectural, structural, residential, commercial
- F. Concrete equipment
 1. ready-mix equipment, hand tools, power tools, gas and electric tools
- G. Concrete reinforcement
 1. steel rods, wire mesh, sizes, ties, bolsters
- H. Concrete forms
 1. types – wood and steel, reinforcing, anchors
- I. Concrete handling
 1. placing concrete, finishes, curing, sealers
- J. Mortar
 1. Ingredients, types, mixes, admixtures
- K. Concrete units
 1. block, brick, specialties
- L. Clay products
 1. Block, tile, fire brick
- M. Mason tools and aids
 1. type, size, maintenance, care
- N. Stone products
 1. Natural stone, man-made stone, rubble stone, cut stone
- O. Manufacturing of masonry products
 1. ingredients, procedures
- P. Concrete block walls

- 1. residential, commercial, decorative
- Q.** Clay brick walls
 - 1. Residential, commercial, veneer walls, screen walls
- R.** Other masonry structures
- S.** Anchor, wall ties, mesh, re-rods
 - 1. Masonry wall care
- T.** Brick bonds and joints
 - 1. Types, tools
- U.** Mortar mixing
 - 1. Operation, proportions, consistency, machine mixing, hand mixing
- V.** Block projects
 - 1. 4' block wall, block corner, 8' square building (3 courses high)
- W.** Brick projects
 - 1. 4' brick wall, brick corner, 8' brick wall, soldier course
- X.** On-the-job training
 - 1. Brick, block, concrete
- Y.** Concrete construction
 - 1. Mixes, admixtures, placing, troweling, finishes
- Z.** Safety

V. INSTRUCTIONAL MATERIALS

- A.** Required Text(s): Kicklighter, *Modern Masonry*, (Refer to CID and/or instructor for current edition)
- B.** Supplies: Calculator and Notebook

VI. METHODS OF PRESENTATION/INSTRUCTION

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

VII. METHODS OF EVALUATION

- A.** Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
 - 1. Tests
 - 2. Quizzes
 - 3. Discussions
 - 4. Homework
 - 5. Lab Projects.

VIII. SPECIFIC COURSE REQUIREMENTS

- A.** Student must meet all of the following to receive a passing grade:

1. Achieve a passing grade of “C” (70%) or higher, based on SCC grading scale.
2. Submit own work. Students turning in homework, reports, field notes, or calculations by someone other than themselves will receive 0% and be referred to the Division Dean and Dean of Students for further disciplinary action. Consequences can include failing the course.
3. Demonstrate attitude, skills, and character commensurate with industry standards.