CNST A210: CONCRETE CONSTRUCTION

Item	Value
Curriculum Committee Approval Date	12/02/2020
Top Code	095260 - Masonry, Tile, Cement, Lath and Plaster
Units	5 Total Units
Hours	162 Total Hours (Lecture Hours 54; Lab Hours 108)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

Concrete flatwork and foundations, hands-on surveying, forming and finishing concrete; poured-in-place reinforced concrete, concrete stairs; estimating concrete. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Properly install concrete slabs including calculating quantity, setting up forms, reinforcement, placement of concrete, and finishing.
2. Properly install a foundation system conforming to the Building Code.

Course Objectives

- 1. Demonstrate the ability to solve basic math problems relating to surveying procedures, concrete proportions, and estimating concrete.
- 2. Define characteristics of soil, drainage procedures and surveying procedures.
- 3. Read a measuring tape rapidly and accurately to the nearest 1/16 inch.
- 4. Demonstrate a broad technical knowledge of the materials and uses of concrete
- 5. Apply surveying principles to layouts of elevations.
- 6. Build various types of forming systems
- 7. Place and finish concrete, including the use of all tools and equipment used in concrete construction.
- 8. Calculate the cubic yards for concrete.
- 9. Calculate the appropriate amount of forming material necessary to pour a job.
- 10. Use mathematical formulas to complete a concrete job.
- 11. Place reinforcement per the Building Code and size reinforcement properly
- 12. Construct concrete footings as per the Building Code for a single story, two story and three story residential structures.

Lecture Content

Orientation to construction lab area. Safety procedures for all work in the lab. Safety Examination. Basic hand tools for concrete. Power tools for the trade. Learning to use the basic tools. Character of soils. Soil types. Bearing strengths of soils and drainage. Surveying procedures. Locating building corners. Checking squareness of layout. Forms for flatwork Checking squareness in forms Forms for foundation walls Poured in place forms. Forming for stairs. Stair forms. Tools used in placing and finishing concrete. Concrete Ready Mix companies compared to on the job mixed concrete History and uses of concrete. Manufacture and types of cements. Make up of concrete. Placing, finishing, and curing concrete Methods of transporting concrete. Joints for flatwork. Water and aggregates for concrete Air entrainment and other admixtures. Concrete mix design Quantity calculations, proportioning mixes. Hot and cold weather concreting. Sampling and testing concrete. ACI (American Concrete Institute) standards. Reinforcing for concrete. Pre and post tensioned concrete. Estimating concrete quantities for slabs, foundations, columns. Foundation types. Flat work finish types Stamped concrete. Colored concrete.

Lab Content

Orientation to construction lab area. Safety procedures for all work in the lab. Safety Examination. Basic hand tools for concrete. Power tools for the trade. Learning to use the basic tools. Character of soils. Soil types. Bearing strengths of soils and drainage. Surveying procedures. Locating building corners. Checking squareness of layout. Forms for flatwork Checking squareness in forms Forms for foundation walls Poured in place forms. Forming for stairs. Stair forms. Tools used in placing and finishing concrete. Concrete Ready Mix companies compared to on the job mixed concrete History and uses of concrete. Manufacture and types of cements. Make up of concrete. Placing, finishing, and curing concrete Methods of transporting concrete. Joints for flatwork. Water and aggregates for concrete Air entrainment and other admixtures. Concrete mix design Quantity calculations, proportioning mixes. Hot and cold weather concreting. Sampling and testing concrete. ACI (American Concrete Institute) standards. Reinforcing for concrete. Pre and post tensioned concrete. Estimating concrete quantities for slabs, foundations, columns. Foundation types. Flat work finish types Stamped concrete. Colored concrete.

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- Lab (04)
- DE Live Online Lab (04S)

Instructional Techniques

Lecture, demonstrations, cooperative learning groups, and lab assignments.

Reading Assignments

Students are assigned a weekly reading assignment covering building codes and construction procedure.

Writing Assignments

Homework assignments and lab competency of trade techniques.

Out-of-class Assignments

.

Demonstration of Critical Thinking

Students will be given various types of written tests for their evaluation in this course during this semester. These will include identification, multiple choice, fill-in the blank, and mathematical calculation. Students

will be required to due lab assignments. Students will be required to participate in class discussions and presentations

Required Writing, Problem Solving, Skills Demonstration

Homework assignments and lab competency of trade techniques.

Textbooks Resources

1. Required Koel, Leonard. Concrete Formwork,, 2nd Ed. ed. Illinois: American Technical Publishers, Inc, 1997 Rationale: latest