



Course Outline

2026-2027 Catalog

CNST 20 - Foundations and Concrete Structures

Catalog Description

Transfer Status: CSU

Unit(s): 3.00

Lecture: 34.00 Contact hours/68.00 Out of class hours/102.00 Total hours/2.00 Unit(s)

Lab: 51.00 Contact hours/0.00 Out of class hours/51.00 Total hours/1.00 Unit(s)

Total: 85.00 Contact hours/68.00 Out of class hours/153.00 Total hours/3.00 Unit(s)

Course Description: This course is a comprehensive study of foundations and structures. Students will learn to analyze the practical applications of foundations/structures and the corresponding layout, excavation, form system, and material placement. Modern methods of material delivery and placement for foundations/structures and their forming system are studied and practiced.

Objectives

Upon successful completion of this course, the student should be able to:

1. Identify the safety hazards associated with concrete and concrete activities.
2. Demonstrate the use and care of the tools used for concrete construction.
3. Identify and understand the main components of a foundation.
4. Discuss building layout and the use of batter boards.
5. Identify the different types of forming systems and understand the correct application.
6. Articulate the advantages and disadvantages of the different foundation systems.
7. Compare and contrast the various methods of reinforcing foundations and structures.
8. Identify the different materials and hardware used in forming systems.
9. Demonstrate the ability to layout, form, and square a simple structure.

Course Content

Topic Titles / Suggested Time Topic

Lecture

<u>Topics</u>	<u>Lec Hrs</u>
Safety in Concrete Construction	3.00
Introduction to Concrete Foundations	4.00
Introduction to Forming Systems	4.00
Stem-wall Foundations and Form Systems	3.00
Slab on Grade (SOG) Foundations and Form Systems	3.00
Specialized Foundations and Methods	3.00
Concrete Structures and Form Systems	3.00
Concrete Steps, Ramps, and Walkways	3.00
Concrete Walls and Form Systems	3.00
Specialized Form Materials, Form Material Storage and Care	2.00
Estimating Concrete Construction	3.00
Total Hours:	34.00

Lab

<u>Topics</u>	<u>Lab Hrs</u>
Concrete Construction Safety and Lab Procedures	3.00
Introduction to Concrete and Forming Tools	3.00
Concrete Tools and their Safe Use	3.00
Forming Systems and their Tools and Safe Use	3.00
Stem-Wall Foundations	9.00
Slab on Grade Construction	6.00
Concrete Structures	9.00
Concrete Steps, Ramps, and Walkways	6.00
Concrete Walls	6.00
Form Material Care and Storage	3.00
Total Hours:	51.00

Methods of Instruction

- A. Demonstrations
- B. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- C. Lecture
- D. Multimedia Presentations
- E. Laboratory Experiments

Methods of Evaluation

- A. Exams/Tests
- B. Quizzes
- C. Homework
- D. Lab Projects

Examples of Assignments

Reading Assignments

1. Read the section on stem wall foundations and be prepared to discuss in class.
2. Read assigned trade journal article and be prepared to discuss in class.

Writing Assignments

1. Write a detailed description of the process of squaring a slab foundation.
2. Write a one-page essay detailing the advantages and disadvantages of pumping foundation concrete.

Out-of-Class Assignments

1. Utilizing the City of Chico website, locate the standard plan for a stem-wall foundation and be prepared to discuss in class.
2. Research OSHA publications regarding the dangers that cement and silica pose to human health and write a one-page essay.

Recommended Materials of Instruction

Nawy, Edward G. (2008). Concrete Construction Engineering Handbook. *CRC Press, 2nd*.

Other Learning Materials

All tools listed in the Core Program Guide.

Minimum Qualifications

Building Codes And Regs
Construction Management
Construction Technology
Engineering (Masters Required)
Engineering Technology (Masters Required)
Industrial Technology
Manufacturing Technology

Created/Revised by: Williams, Tom

Date: 02/25/2019