# BI 0007 - BUILDING WITH GREEN CONSTRUCTION MATERIALS

## Catalog Description

Formerly known as CET 7
Advisory: Completion with grade of "C" or better or concurrent enrollment in BI 1
Hours: 180 (18 lecture, 162 laboratory)
Description: Project-based study of the performance characteristics of building materials using sustainable construction techniques and materials. Includes the basic properties and installation techniques of metals, aggregates, cement products, asphalt products and wood. Safe handling of construction materials and tools. (CSU)

## Course Student Learning Outcomes

- CSLO #1: Demonstrate proper and safe power tool use.
- CSLO #2: Construction of a solar-ready structure.
- CSLO #3: Apply fundamental building principles to a green building project.

## Effective Term

Spring 2021

## Course Type

Credit - Degree-applicable

## Contact Hours

180

## Outside of Class Hours

36

## Total Student Learning Hours

216

## Course Objectives

Lecture Objectives:
1. Recognize the basic materials of construction and related performance characteristics.
2. Evaluate the performance characteristics of a variety of construction materials.
3. Explain the importance of proper installation.
4. Compare and contrast the performance characteristics of different materials.
5. Compare and contrast solid sawn lumber with engineered lumber products.
6. Describe common fasteners and adhesives commonly used in construction.
7. Examine sustainable and "green" building materials.
8. Define the term "solar ready".
9. Identify the structural components of a building.
Laboratory Objectives:
1. Identify the interaction of construction materials through hands-on experiences.
2. Conduct green lab projects following prescribed installation procedures.
3. Prepare a structure for future solar installation.
4. Demonstrate proper and safe power tool use.
5. Construct a solar ready structure utilizing fundamental building principles.
6. Interpret construction drawings.
7. Create a materials list and specify materials.
8. Install common fasteners and adhesives.
9. Select appropriate products used for specific construction applications.
10. Test the effectiveness of different material types.
11. Demonstrate proper and safe use of tools.
12. Identify proper tools to be used for installing specific materials.
13. Construct roof system to meet structural load specifications.
14. Construct a structure framing project incorporating conventional and green building standards.
15. Construct a floor system.
16. Seal and insulate a structure to product specifications.
17. Install and test the performance of windows.
18. Install finish materials.
19. Install drywall using fasteners and finishing techniques.

## General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

## Articulation Information

- CSU Transferable

## Methods of Evaluation

- Objective Examinations
  - Example: Examinations of class and book concepts based on learning objectives. Example: What is a Structural Insulated Panel (SIP) used for? a) Building walls b) Building floors c) Insulation d) All of the above
- Skill Demonstrations
  - Example: Perform hands on demonstrations of competence in proper and safe power tool use. Student performance will be evaluated using a safety rubric.

## Repeatable

No

## Methods of Instruction

- Laboratory
- Lecture/Discussion
- Distance Learning

Lab:

1. Lab techniques will be presented in a "describe / show / review" methodology. Students will complete a safety test before using equipment. Instructor will work with students until they can

successfully complete the test with 100% success rate. (Lab Objective 4)

Lecture:

1. Instructor will lecture on common fasteners and adhesives. The student will be given an opportunity to clarify any questions in an instructor-guided discussion. (Lecture Objective 2)

Distance Learning

1. Students in online classes participate, individually and in groups, in discussion boards and respond to weekly assignments via the Learning Management System. The instructor will provide documented material (including videos) explaining or exploring the course content and provide individual feedback on all assignments. Instructor will lecture on the psychical characteristics of "green" building materials and the properties that make them "sustainable." Students will take notes and then research the longevity of these materials in different climates. (Lecture Objective 7)

## Typical Out of Class Assignments Reading Assignments

1. Read the text and identify 4 different species of wood that are commonly used in construction projects. 2. Read articles that discuss the differences between engineered and non-engineered panels.

## Writing, Problem Solving or Performance

1. Write a paper that identifies the proper sizes and methods for fastening drywall. 2. Create a chart identifying, manufacturer, composition, uses and sizes of laminated wood products.

## Other (Term projects, research papers, portfolios, etc.)

Team hands-on project building solar-ready structure.

## Required Materials

- Carpentry
  - Author: Floyd Vogt
  - Publisher: Cengage Leaning
  - Publication Date: 2019
  - Text Edition: 7th
  - Classic Textbook?: No
  - OER Link:
  - OER:
- Green Building: Principles and Practices in Residential Construction (Go Green with Renewable Energy Resources)
  - Author: Carl Seville and Abe Kruger
  - Publisher: Cengage Learning
  - Publication Date: 2012
  - Text Edition: 1st
  - Classic Textbook?: No
  - OER Link:
  - OER:

## Other materials and-or supplies required of students that contribute to the cost of the course.

Safety glasses, ANSI approved hard hat, 2 crescent wrenches 8" and 10", 2 hammers (22 oz. framing hammer, 16 oz. finish hammer), tool belt, utility knife, speed square, nail puller, short hand saw, chalk box, 6" diagonals, linemen's pliers, 4 and 1 screwdriver, 10" channel locks, 3/4" wood chisel, steel toe boots, sturdy carpenter's pants or overalls, 25'tape measure.