

CATALOG INFORMATION

Dept and Nbr: CONS 71A      Title: MATERIALS & METHODS  
Full Title: Materials and Methods of Construction  
Last Reviewed: 10/8/2018

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	2.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	2.00	Lab Scheduled	0	17.5	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	2.00		Contact Total	35.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00

Total Student Learning Hours: 105.00

Title 5 Category: AA Degree Applicable  
Grading:            Grade Only  
Repeatability:    00 - Two Repeats if Grade was D, F, NC, or NP  
Also Listed As:   ARCH 71A  
Formerly:

**Catalog Description:**  
An investigation of foundation systems, heavy timber construction, wood light frame and metal light gauge construction, roofing systems, windows and doors. Includes applications requiring calculations and sketching.

**Prerequisites/Corequisites:**  
Course Completion of ARCH 56 and Course Completion of APTECH 90B ( or CET 90B) OR Course Completion of CONS 60 ( or CONS 270 or CONS 370 or CONS 82) and Course Completion of APTECH 90B ( or CET 90B)

**Recommended Preparation:**  
Eligibility for ENGL 100 or ESL 100

**Limits on Enrollment:**

**Schedule of Classes Information:**  
Description: Foundation systems, heavy timber construction, wood light frame and metal light gauge construction, roofing systems, windows and doors. Includes calculations and sketching. (Grade Only)  
Prerequisites/Corequisites: Course Completion of ARCH 56 and Course Completion of

APTECH 90B ( or CET 90B) OR Course Completion of CONS 60 ( or CONS 270 or CONS 370 or CONS 82) and Course Completion of APTECH 90B ( or CET 90B)

Recommended: Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

### **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>CSU Transfer:</b>	Transferable	Effective: Spring 2003	Inactive:
<b>UC Transfer:</b>		Effective:	Inactive:

**CID:**

**Certificate/Major Applicable:**

Both Certificate and Major Applicable

### **COURSE CONTENT**

#### **Outcomes and Objectives:**

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

1. Evaluate the major constraints involved in choosing building systems, including Code restrictions.
2. Analyze the function of foundations for buildings and determine appropriate foundation system for different building loads and soil types.
3. Compare characteristics of different wood species and the results of the seasoning process in the production of lumber and the manufacture of wood products.
4. Evaluate attributes of platform framing and balloon framing and apply the logic of wood light framing to building frame design.
5. Evaluate attributes of light gauge steel framing and apply the logic of light gauge steel framing to building frame design.
6. Analyze the role of vapor retarders and insulation in building assemblies and apply to wood light and steel light gauge framing systems.
7. Analyze exterior siding systems and materials and apply to wood light and steel light gauge framing systems.
8. Analyze low slope and steep roof systems and materials and evaluate roofing options for large and small roofs.
9. Analyze door and window systems and materials and evaluate options for wood light and steel light gauge framing systems.

#### **Topics and Scope:**

1. Building process and Codes
  - a. Design and building process participants
  - b. Choosing building systems - constraints and information sources
  - c. Organization of the Code by building Type
  - d. Interpreting common Code information about building uses and fire resistance levels required for different building Types
2. Soils and Foundations
  - a. Function of a foundation
  - b. Identifying loads
  - c. Soil types and characteristics
  - d. Excavation alternatives - shoring and bracing options
  - e. Logic of shallow foundation systems - examples
  - f. Retaining wall systems - avoiding common problems
  - g. Waterproofing the foundation system
  - h. Drainage options for foundation systems
3. Wood
  - a. Growth characteristics of wood species
  - b. How lumber is made - sawing, seasoning, surfacing, grading
  - c. Common panel products - plywood, OSB (oriented strand board), etc.
  - d. Glued and laminated lumber products
  - e. Wood fasteners
  - f. Wood manufactured building components
  - g. Types of wood construction
4. Wood light frame construction
  - a. History of use
  - b. Balloon frame characteristics
  - c. Platform frame characteristics
  - d. The logic of the wood light frame system
  - e. Elements of the system and their connections
  - f. Common problems of wood light frame systems
  - g. Unique characteristics of wood light frame systems
  - h. Building Code concerns
5. Light gauge steel frame construction
  - a. History of use
  - b. The logic of light gauge steel frame system
  - c. Elements of the system and their connections
  - d. Common problems of light gauge steel frame system
  - e. Unique characteristics of steel light gauge frame system
  - f. Building Code concerns
6. Exterior finishes for wood light frame and steel light gauge frame systems
  - a. Roofing materials and installation
  - b. Windows and doors and installation
  - c. Exterior siding materials and installation
  - d. Residential exterior construction and finishes
7. Interior finishes for wood light frame and steel light gauge frame systems
  - a. Thermal insulation materials and installation
  - b. How vapor retarders work
  - c. Wall and ceiling finishes and installation
8. Roofing
  - a. History of roofing systems

- b. The logic of low slope roofing systems
- c. Elements of low slope roof systems and their connection
- d. Large area low slope roof systems
- e. Common problems of low slope roofing systems
- f. The logic of steep slope roofing systems
- g. Elements of steep slope roof systems and their connection
- i. Common problems of steep slope roofing systems
- j. Building Code concerns
- 9. Glass and glazing
  - a. History of use
  - b. The glass making process
  - c. The theory of glazing
  - d. Other materials of glazing - plastics
  - e. Special treatments for glass
  - f. Energy performance of glazing units
  - g. Building Code concerns
- 10. Windows and Doors
  - a. Types of windows and frames and their installation
  - b. The logic of window frame design
  - c. Glazing in the frame for wood light and steel light gauge framing systems
  - d. Types of doors and frames and their installation

### Assignment:

1. Read 20 - 30 pages per week in text and prepare outlines of chapters.
2. Interpret working drawing content.
3. Exercises to apply information to specific situations, including sketches and calculations.
4. Research for and preparation of a 3-5 page term paper on a material or method of construction.
5. Written assignments involving analysis and synthesis of course material.
6. Exams include objective exams; sketches and problems.

### Methods of Evaluation/Basis of Grade:

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written homework, Term papers, Chapter outlines.

Writing  
20 - 35%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, Application of exercises, including calculations.

Problem solving  
30 - 50%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Sketches

Skill Demonstrations  
5 - 10%

**Exams:** All forms of formal testing, other than skill performance exams.

Multiple choice, True/false, Matching items, Completion, Short answer; sketches.

Exams  
20 - 30%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Class Participation.

Other Category  
0 - 5%

**Representative Textbooks and Materials:**

Allen, Edward. Materials and Methods: Fundamentals of Construction. John Wiley & Sons, 2004.