

**ARCH 71A Course Outline as of Fall 2019****CATALOG INFORMATION**

Dept and Nbr: ARCH 71A Title: MATERIALS/METHODS CONS 1

Full Title: Materials and Methods of Construction 1

Last Reviewed: 3/13/2012

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:

Formerly: CONS 71

**Catalog Description:**

Study of foundation systems; wall, floor and roof framing systems; exterior and interior finishes; windows and doors; and sustainability issues as found in light-wood frame and light-steel frame construction systems. Includes calculations and sketching.

**Prerequisites/Corequisites:**

Course Completion of ARCH 56 OR Course Completion of ARCH 52B ( or ARCH 26B or ARCH 62B)

**Recommended Preparation:**

Eligibility for ENGL 100 or ESL 100 and Course Completion of MATH 155 OR Course Completion of MATH 154

**Limits on Enrollment:****Schedule of Classes Information:**

Description: Study of: foundation systems; wall, floor and roof framing systems; exterior and interior finishes; windows and doors; and sustainability issues as found in light-wood frame and light-steel frame construction systems. Includes calculations and sketching. (Grade Only)

Prerequisites/Corequisites: Course Completion of ARCH 56 OR Course Completion of ARCH

52B ( or ARCH 26B or ARCH 62B)

Recommended: Eligibility for ENGL 100 or ESL 100 and Course Completion of MATH 155  
OR Course Completion of MATH 154

Limits on Enrollment:

Transfer Credit:

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:
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<b>CSU Transfer:</b>	Effective:	Inactive:
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<b>UC Transfer:</b>	Effective:	Inactive:
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**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 and finish materials for light-wood and light-steel framed buildings including Code restrictions and sustainability impacts.
2. Analyze the function of foundations for small buildings.
3. Evaluate attributes of platform framing and balloon framing and apply the logic of light-wood framing to building design.
4. Evaluate attributes of light-steel framing and apply the logic of light-steel framing to building design.
5. Analyze materials used in exterior siding systems, steep roof systems, doors and windows as they apply to light-wood and light-steel 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, including size calculations
- 3. Building process and building codes
  - a. Design and building process participants
  - b. Choosing building systems - constraints and information sources
  - c. Organization of the building code by building type
  - d. Interpreting common building code information about building uses and fire resistance levels required for different building types
- 4. Soils and foundations
  - a. Function of a foundation
  - b. Identifying loads
  - c. Soil types and characteristics
  - d. Excavation alternatives - shoring and bracing options
  - e. Principles of shallow foundation systems - examples, including size calculations
  - f. Retaining wall systems - avoiding common problems
  - g. Waterproofing the foundation system
  - h. Drainage options for foundation systems
  - i. Sustainability issues related to soils and foundations
- 5. Wood
  - a. Growth characteristics of wood species
  - b. How lumber is made - sawing, seasoning, surfacing, grading
  - c. Common panel products, such as 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
  - h. Sustainability issues related to wood
- 6. Light-wood frame construction
  - a. History of use
  - b. Balloon frame characteristics
  - c. Platform frame characteristics
  - d. Principles of the light-wood frame system - examples, including size calculations
  - e. Elements of the system and their connections
  - f. Common problems of light-wood frame systems
  - g. Unique characteristics of light-wood frame systems
  - h. Building code concerns
  - i. Sustainability issues related to light-wood frame construction
- 7. Light-steel frame construction
  - a. History of use
  - b. Principles of light-steel framed system - examples, including size calculations
  - c. Elements of the system and their connections
  - d. Common problems of light-steel framed system
  - e. Unique characteristics light-steel framed system
  - f. Building code concerns
  - g. Sustainability issues related to light-steel framed construction
- 8. Overview of exterior finishes for light-wood frame and light-steel framed buildings
  - a. Roofing materials and installation
  - b. Windows and doors and installation
  - c. Exterior siding materials and installation
  - d. Residential exterior construction and finishes
  - e. Sustainability issues related to exterior finishes
- 9. Interior finishes for light-wood frame and light-steel framed systems
  - a. Thermal insulation materials and installation

- b. How vapor retarders work
  - c. Wall and ceiling finishes and installation
  - d. Sustainability issues related to interior finishes
10. Roofing for small buildings
- a. History of roofing systems
  - b. Principles of steep slope roofing systems
  - c. Elements of steep slope roof systems and their installation in light-wood and light-steel framed buildings
  - d. Common problems of steep slope roofing systems
  - e. Building code concerns
  - f. Sustainability issues related to roofing
11. 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
  - h. Sustainability issues related to glass and glazing
12. Windows and doors
- a. Types of windows and frames and their installation in light-wood and light-steel framed buildings
  - b. Principles of window frame design
  - c. Types of doors and frames and their installation
  - d. Sustainability issues related to windows and doors

**Assignment:**

1. Read 20 - 30 pages per week in text and prepare outlines of readings.
2. Problem solving homework assignments involving analysis and synthesis of course material, including sketches, calculations and interpreting working drawing content (8-12)
3. Research papers (1-2, each three to five pages long)
4. Quizzes ( 2-3 )
5. Final exam or final project and presentation.

**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, research paper/s, chapter outlines and documentation of final project - if any	Writing 20 - 35%
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**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, application of course material to exercises, including calculations and sketches	Problem solving 40 - 60%
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**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations  
0 - 0%

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

Quizzes and optional final exam: Multiple choice, true/false, matching items, completion, short answer; and may include calculations and sketches

Exams  
20 - 30%

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

Class participation and presentation of final project - if any

Other Category  
0 - 10%

**Representative Textbooks and Materials:**

Allen, Edward; Iano, Joseph: Materials and Methods: Fundamentals of Construction. John Wiley & Sons, Fifth Edition, 2008

Instructor prepared materials