CONS 71A Course Outline as of Fall 2019

CATALOG INFORMATION

Dept and Nbr: CONS 71A Title: MATERIALS/METHODS CONS 1
Full Title: Materials and Methods of Construction 1
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	8	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:	

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 APTECH 45

Recommended Preparation:
Eligibility for ENGL 100 or ESL 100

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 APTECH 45
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:

AS Degree:	**Area**			Effective:	Inactive:
CSU GE:	**Transfer Area**			Effective:	Inactive:
IGETC:	**Transfer Area**			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Spring 2003	Inactive:	
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:
Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Identify and define the elements of light-wood and light-steel framing systems and materials used in foundations, floors, walls and roofs
2. Graphically represent common connections between elements of light-wood and light-steel framing systems
3. Select appropriate interior finishes, exterior finishes, windows and doors for light-wood and light-steel framed buildings

Objectives:
At the conclusion of this course, the student should 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 building 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 principles of light-wood framing to building design
4. Evaluate attributes of light-steel framing and apply the principles of light-steel framing to building design
5. Analyze materials used in exterior siding systems, sloped roof systems, doors and windows as they apply to light-wood and light-steel framing systems

Topics and Scope:

I. 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
   E. Fire resistance levels required for different building types
   F. The California Department of Forestry and Fire Protection (CAL FIRE) Wildland Urban

Interface (WUI)

II. 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
- F. Basic sizing calculations
- G. Retaining wall systems, avoiding common problems
- H. Waterproofing the foundation system
- I. Drainage options for foundation systems
- J. Stainability issues related to soils and foundations

III. Wood
- A. Growth characteristics of wood species
- B. Lumber manufacturing: harvesting, seasoning, milling, surfacing, grading
- C. Common panel products such as plywood, oriented strand board (OSB)
- D. Glued and laminated lumber products such as glulam beams (GLB) and structural composite lumber (SCL)
- E. Wood fasteners
- F. Wood manufactured building components
- G. Types of wood construction
- H. Sustainability issues related to wood and the Forest Stewardship Council (FSC)

IV. Light-Wood Frame Construction
- A. History of use
- B. Balloon frame characteristics
- C. Platform frame characteristics
- D. Principles of the light-wood frame system
- E. Basic sizing calculations
- F. Elements of the system and their connections
- G. Common problems of light-wood frame systems
- H. Unique characteristics of light-wood frame systems
- I. Building code concerns
- J. Sustainability issues related to light-wood frame construction

V. Light-Steel Frame Construction
- A. History of use
- B. Principles of light-steel framed system
- C. Basic sizing calculations
- D. Elements of the system and their connections
- E. Common problems of light-steel framed system
- F. Unique characteristics light-steel framed system
- G. Building code concerns
- H. Sustainability issues related to light-steel framed construction

VI. 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. Exterior construction and finishes
- E. Vented and ventilated rainscreens
- F. Sustainability issues related to exterior finishes

VII. 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

VIII. 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

IX. 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

X. 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. Reading of text (20-30 pages per week) and preparation of outlines from readings (2-3 pages)
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 with 3-5 pages each)
4. Quizzes (2-3)
5. Final exam and/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	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 course material to exercises, including calculations and sketches	Problem solving 40 - 60%

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/or final exam	Exams 10 - 30%

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

Class participation and/or presentation of final project	Other Category 0 - 20%

Representative Textbooks and Materials:
Fundamentals of Building Construction: Materials and Methods. 6th ed. Allen, Edward and Iano, Joseph. John Wiley & Sons. 2013 (classic)
Instructor prepared materials