CONS 71B Course Outline as of Fall 2025

CATALOG INFORMATION

Dept and Nbr: CONS 71B Title: MATERIALS/METHODS CONS 2
Full Title: Materials and Methods of Construction 2
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 or P/NP
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 heavy timber, heavy steel, masonry and concrete building construction systems. Includes calculations and sketching.

Prerequisites/Corequisites:
Course Completion of CONS 71A

Recommended Preparation:

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 heavy timber, heavy steel, masonry and concrete building construction systems. Includes calculations and sketching. (Grade or P/NP)
Prerequisites/Corequisites: Course Completion of CONS 71A
Recommended:

Limits on Enrollment:
Transfer Credit:
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:	Effective:	Inactive:
UC Transfer:	Effective:	Inactive:

CID:

Certificate/Major Applicable:
Certificate Applicable Course

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Describe how the elements of heavy timber, heavy steel, masonry and concrete building systems are applied in making foundations, floors, walls and roofs.
2. Graphically represent common connections between elements of heavy timber, heavy steel, masonry and concrete building systems.
3. Evaluate the sustainability aspects of the building systems and materials covered.

Objectives:
At the conclusion of this course, the student should be able to:
1. Identify and define the elements of heavy timber, heavy steel, masonry and concrete building systems used in making foundations, floors, walls and roofs.
2. Sketch common connections found in heavy timber, heavy steel, masonry and concrete building construction systems.
3. Calculate preliminary sizes of framing elements used in heavy timber, heavy steel, masonry and concrete building construction systems.
4. Describe the manufacturing processes for major materials used in heavy timber, heavy steel, masonry and concrete building construction systems.
5. Define sustainability attributes of heavy timber, heavy steel, masonry and concrete building construction systems.

Topics and Scope:

I. Introduction and Overview
   A. Typical commercial building construction versus typical residential building construction
      1. Examples of heavy timber, heavy steel, masonry and concrete building systems
      2. Review of building code classification of "types"
   B. Why sustainability is important
   C. Review of basic sketching skills

D. Review of types of calculations used in this class

II. Foundation Systems for Large Buildings
- A. Loads and load transfer to foundations
- B. Excavation and slope control
- C. Deep foundation types: caissons, piles, floating and mat
- D. Special cases
- E. Sustainability issues
- F. Preliminary calculation of sizes and sketching of foundations

III. Heavy Timber Construction
- A. Description of the system, its elements and attributes
- B. Connection of frame members to each other and to the foundation
- C. Dealing with long spans
- D. Code concerns
- E. Sustainability issues
- F. Preliminary calculation of frame element sizes and sketching of connections

IV. Heavy Steel Construction
- A. Description of the system, its elements and attributes
- B. Connection of frame members to each other and to the foundation
- C. Dealing with long spans
- D. Code concerns
- E. Sustainability issues
- F. Preliminary calculation of frame element sizes and sketching of connections
- G. Manufacturing heavy steel

V. Masonry Construction: Brick, Stone and Concrete Block
- A. Description of different masonry systems, elements and attributes of each
- B. Manufacturing brick, concrete blocks and mortar
- C. Quarrying and preparation of stone
- D. Connection of elements to each other and to the foundation
- E. Code concerns
- F. Dimensioning and sketching of connections
- G. Sustainability issues

VI. Concrete Construction
- A. History of use
- B. Concrete: characteristics and manufacture
- C. Making formwork and placing concrete
- D. Principles of reinforcing for concrete
- E. Sustainability issues related to concrete

VII. Site Cast/in situ Concrete Framing Systems
- A. Slabs, walls and columns
- B. Principles of a one-way concrete system
- C. Principles of a two-way concrete system
- D. Post-tensioning a site cast concrete system
- E. Principles of economic design of site cast concrete systems
- F. Code concerns
- G. Sustainability issues related to site cast concrete framing systems
- H. Preliminary calculation of frame element sizes and sketching of connections

VIII. Precast Concrete Framing Systems
- A. Typical precast structural elements and how they are manufactured
- B. Principles of assembly concepts for precast buildings
- C. Connections of elements in the system
- D. Code concerns
- E. Sustainability issues related to precast concrete framing systems

F. Preliminary calculation of frame element sizes and sketching of connections

IX. Roofs for Large Buildings
- A. Description of different low-sloped systems, elements and attributes of each
- B. Principles of low slope roofing systems
- C. Connections of elements in the system
- D. Common problems of low slope roofing systems
- E. Code concerns
- F. Sustainability issues
- G. Sketching of connections

X. High-Rise Cladding Systems including Windows and Doors
- A. Description of different cladding systems, elements and attributes of each
- B. Design requirements for cladding systems
- C. Principles of designing watertight joints in cladding
- D. Sealant joints in cladding
- E. Code concerns
- F. Sustainability issues
- G. Sketching of connections

Assignment:

1. Reading of text (20-30 pages per week) and preparation of outlines from readings (2-3 pages each)
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.

Research papers and chapter outlines	Writing 20 - 35%

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

Problem solving homework assignments, sketches & calculations	Problem solving 30 - 50%

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	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:
Allen, Edward; Iano, Joseph: Fundamentals of Construction: Materials and Methods. John Wiley & Sons, Fifth Edition, 2008 (classic)
Instructor prepared materials