CONS 62 Course Outline as of Fall 2019

CATALOG INFORMATION

Dept and Nbr: CONS 62 Title: BLUEPRINT READING
Full Title: Blueprint Reading and Construction Graphics
Last Reviewed: 5/14/2018

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 157.50

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:
Introduction to blueprint reading and construction graphics for residential and commercial buildings including: framing systems; architectural working drawings and electrical, mechanical and plumbing plans; common California Building Code and sustainability issues. Includes scale use and sketching techniques.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 1A or equivalent

Limits on Enrollment:

Schedule of Classes Information:
Description: Introduction to blueprint reading and construction graphics for residential and commercial buildings including: framing systems; architectural working drawings and electrical, mechanical and plumbing plans; common California Building Code and sustainability issues. Includes scale use and sketching techniques. (Grade Only)
Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 1A or equivalent
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:	Fall 2011	Inactive:	Fall 2024
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. Explain the organization and content of a set of construction documents: working drawings, specifications and regulatory authority documentation
2. Interpret information from working drawings
3. Sketch common construction details

Objectives:
During the course, students will:
1. Use a scale to interpret dimensional information on working drawings
2. Understand how a set of construction documents are organized and coordinated
3. Identify different structural systems used in residential and commercial construction and categorize by building type
4. Interpret content found on the working drawings, including related details for: site plans, foundation plans, floor framing plans, roof framing plans, sections, elevations, details, schedules, electrical plans and utility plans
5. Create scalable, sketched building construction details
6. Identify common code requirements reflected in the working drawings
7. Explain sustainability issues reflected in the working drawings

Topics and Scope:

I. Introduction and Overview
   A. Design and construction process participants
      1. Role of professionals: architect, surveyor, engineer, and contractors
      2. Role of regulatory authority: planning and code approval enforcement agencies
      3. "Green" regulations, Leadership in Energy and Environmental Design (LEED), and Build It Green certification

4. Sustainable design: passive solar principles, material, and equipment choices
B. Minimum requirements for residential and commercial working drawings
1. Working drawings types: site plan, floor plan, foundation plan, floor framing plan, roof framing plan, sections (cross and longitudinal), details, exterior elevations, interior elevations, schedules, and special drawings as required
2. Other documentation required: specifications and regulatory agency requirements, Title 24, Cal Green, and engineering calculations
3. Other construction-related drawings: renderings, isometrics, animations, and pictorials
C. Introduction to the building code and regulatory agencies
1. Building classification by construction types: Types I - V
2. Building use: occupancies
D. Logic of construction
1. Loads in buildings
2. Foundation and floor/slab elements
3. Load-bearing walls and beams
4. Floor framing elements
5. Roof framing elements
6. Tracking loads

II. Overview of Working Drawings
A. Scales and dimensions: architectural and engineering scaled sketches and drawings
B. Common construction calculations related to drawings
C. Orthographic projection in working drawings
1. Views of different working drawings
2. Relationships among views
3. Principles of orthographic projection
4. Sketching using orthographic projection
D. Line work, lettering, dimensions, symbols and notes
1. Line widths and types
2. Lettering style and legibility
3. Dimensional hierarchy and references
4. Common symbols by drawing type
5. Note format and content
E. Common terminology and abbreviations

III. Sites and Site Plan Drawings
A. Legal descriptions: property line distances and bearings, easements and rights-of-way
B. Topography and soil: contour lines, rocks, water, faults and soil types
C. Biological information: flora and fauna
D. Climate information: solar path, precipitation, temperature, wind, and humidity
E. Grading plans: drainage, cut and fill for construction
F. Impacts of a General Plan: land use, zoning, Planned Unit Development (PUD), and subdivisions
G. Impact of zoning ordinances: setbacks, lot coverage, and building height
H. Site improvements: roads, sidewalks and walkways, driveways, curbs, gutters and infrastructure
I. Landscaping and irrigation plan content
J. Interpreting residential and commercial site plans, landscape plans and related details
K. Common codes and Title 24 requirements
L. Sustainability issues

IV. Floor Plans and Floor Plan Drawings
A. Drawing point of view and representation of information above and below the cut plane
B. Identifying spaces in a building
C. Structural elements: walls, columns, beams, and diaphragms

D. Walls: types, construction, conventions, symbols, and schedules
E. Doors and windows: types, sizes, conventions, symbols, and schedules
F. Finishes, types, conventions, symbols, and schedules
G. Built-in elements: cabinets, plumbing fixtures, HVAC equipment, other
H. Identifying load-bearing walls from a plan
I. Common codes and Title 24 requirements
J. Common structural considerations
K. Interpreting residential and commercial foundation and floor framing plans and related details
L. Sustainability issues

V. Foundations and Foundation Plan Drawings
A. Soil and geotechnical overview
B. Materials, concrete, reinforcing steel, anchor bolts, and hold-downs
C. Types
1. Slab-on-grade
2. Spread footings, including stepped footings
3. Column (point load) footings
4. Retaining walls
5. Others types: pier and grade beam, piles and pile cap, raft mats, and caissons
D. Insulation: R-values, types, and location
E. Foundation drainage and sub-surface water mitigation
F. Space conditioning, plumbing and electrical needs
G. Common codes and Title 24 requirements
H. Common structural considerations
I. Interpreting residential and commercial foundation and floor framing plans and related details
J. Sustainability issues

VI. Slabs and Floor Framing and Slab and Floor Framing Drawings
A. Slab-on-grade system
1. Ground preparation, reinforcing; concrete, construction joints and finishing
2. Connection to foundation, decks/patios
3. Common code requirements
4. Common details
B. Wood floor framing system
1. Posts, beams/girders, joists, blocking, insulation,
2. Openings
3. Sheathing, flashing and finishes
4. Connection of elements: nails, bolts, metal connectors
5. Connection to foundation, decks/patios
6. Common code requirements
7. Common details
C. Common Code and Title 24 requirements
D. Common structural considerations
E. Interpreting residential and commercial foundation and floor framing plans and related details
F. Sustainability issues

VII. Framing Methods - Small Buildings
A. Framing systems for Type V buildings: platform and balloon framing for light wood dimensional lumber and light gauge steel framing and their components
B. Common codes and Title 24 requirements
C. Common structural considerations
D. Interpreting framing plans and related details

E. Sustainability issues

VIII. Framing Methods - Larger Buildings
- A. Framing systems for Type I, II, III, and IV buildings: masonry, heavy timber, heavy steel frame, concrete post and beam (precast and site cast), and concrete solid construction (precast and site cast), and their components
- B. Common codes and Title 24 requirements
- C. Common structural considerations
- D. Interpreting framing plans and related details
- E. Sustainability issues

IX. Roofs and Roof Framing Plans and Related Details
- A. Common roof configurations
- B. Materials for roofs, ceilings, insulation and ventilation
- C. Common codes and Title 24 requirements
- D. Common structural considerations
- E. Interpreting residential and commercial roof framing plans and related details
- F. Sustainability issues

X. Sections and Related Details
- A. Typical building system configurations
- B. Common codes and Title 24 requirements
- C. Common structural considerations
- D. Interpreting residential and commercial sections and related details
- E. Sustainability issues

XI. Elevations and Related Details
- A. Exterior elevations configuration, materials and common construction details
- B. Interior elevations configuration, materials and common construction details
- C. Common codes and Title 24 requirements
- D. Common structural considerations
- E. Interpreting residential and commercial elevations and related details
- F. Sustainability issues

XII. Electrical Systems, Electrical Plans and Related Details
- A. Electrical symbols used on drawings
- B. System elements: meter/service panels, distribution panels, wiring, receptacles, fixtures, and appliances
- C. Photovoltaic and other power generation systems
- D. Common codes and Title 24 requirements
- E. Common structural considerations
- F. Interpreting residential and commercial electrical plans and related details
- G. Sustainability issues

XIII. Plumbing and Mechanical Systems, Utility Plans and Related Details
- A. Plumbing and mechanical symbols used on drawings
- B. Plumbing system elements such as water supply, waste water, and fixtures
- C. Fire sprinkler systems and plans
- D. Mechanical system elements such as heating, ventilating and air conditioning ducts, equipment and fixtures
- E. Landscape irrigation system elements such as water supply, drainage, and irrigation fittings
- F. Common codes and Title 24 requirements
- G. Common structural considerations
- H. Interpreting residential and commercial utility plans and related details
- I. Sustainability issues

Assignment:

1. Reading (20-30 pages per week)
2. Workbook assignments (10-15 question sets)
3. Detail sketches prepared from working drawing references (8-10)
4. Essays (500-750 words) related to blueprint reading (2-3)
5. Quizzes and Final Exam (1-3)

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.

Essays	Writing 10 - 20%

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

Workbook assignments	Problem solving 30 - 40%

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

Sketches of details	Skill Demonstrations 20 - 30%

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

Quizzes and final exam	Exams 15 - 25%

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

Attendance and participation	Other Category 0 - 10%

Representative Textbooks and Materials:
Understanding Construction Drawings. 7th ed. Huth, Mark. Cengage Learning. 2019
Print Reading for Construction. 7th ed. Brown, Walter and Dorfmueller, Daniel. Goodheart-Wilcox. 2019
Print Reading for Architecture and Construction. 3rd ed. Madsen, David A. and Jeffries, Alan and Madsen David P. Cengage Learning. 2013 (classic)
Basic Blueprint Reading and Sketching. 9th ed. Olivo, Thomas P. and Olivo, C. Thomas. Cengage Learning. 2010 (classic)
Construction Graphics: Practical Guide to Interpreting Working Drawings. 2nd ed. Bisharat, Keith. Wiley. 2008 (classic)
Blueprint Reading for Construction. 2nd ed. Fatzinger, James. Pearson. 2003 (classic)
Instructor prepared materials