CONS 62 Course Outline as of Spring 2011

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	8	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

Outcomes and Objectives:
Upon completion of the course, students will be able to:
1. Use a scale to interpret dimensional information on working drawings and to prepare freehand sketches of construction details
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. Sketch details of building construction
6. Identify common (California Building) Code requirements reflected in the working drawings
7. Explain sustainability issues reflected in the working drawings

Topics and Scope:

I. Introduction & Overview
A. Design and construction process participants
1. Role of professionals: architect, surveyor, engineer, contractor
2. Role of regulatory authority: zoning and code approval and enforcement
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 a set of working drawings (Residential/Commercial)
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; Special drawings as required by project
2. Other documentation required, such as specifications and regulatory agency requirements

including Title 24 and engineering calculations
3. Other construction-related drawings, such as renderings, isometrics and pictorials
C. Introduction to the building code and regulatory agencies
1. Categorizing buildings by construction "Types" I - V
2. Building "Occupancies"
D. Logic of construction
1. Loads in buildings
2. Foundation and floor/slab elements
3. Load-bearing walls and beams
4. Second floor framing elements
5. Roof framing elements
6. Tracking loads

II. Overview of working drawings
A. Scales and dimensions: architect's & engineer's and scaled sketches
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. Linework, 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 length and orientation, 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 and humidity
E. Grading Plans: cut and fill for construction
F. Impact of General Plans such as Use Zones and Planned Unit Development/Subdivisions
G. Impact of Zoning Ordinances such as setbacks, lot coverage, and building height
H. Site improvements: roads, sidewalks, curbs
I. Landscape and irrigation plan content
J. Interpreting residential and commercial Site Plans, Landscape Plans and related details
K. Common Code requirements
L. Sustainability issues

IV. Floor plans and Floor Plan drawings
A. Drawing point of view and representation of "hidden" objects
B. Identifying spaces in a building
C. Structural elements: walls, posts and beams
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 Code 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, hold-downs, other
C. Types
1. Slab-on-grade
2. Spread footings, including stepped footings
3. Column (point load) footings
4. Retaining walls
5. Others, such as pier and grade beam, piles and caissons
D. Insulation, types and location
E. Drainage options
F. Space conditioning, plumbing and electrical needs
G. Common Code 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 (Type V) such as platform and balloon light wood framing and light gauge steel framing and their components
B. Common Code 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 (Type I, Type II, Type III, Type IV) such as 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 Code 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. Roof materials for roofs, ceilings, insulation and ventilation

C. Common Code 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 Code 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 Code 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 such as meter, fuse box, wiring, receptacles, fixtures and appliances

C. Photovoltaic and other power generation systems

D. Common Code 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/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 Code 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. Assignments: 10-15 sets of questions and working drawing interpretations for content
3. Detail sketches: 8-10 prepared from working drawing references per semester
4. Essays: 2-3 brief essays (2-3 pages each) about issues related to blueprint reading per semester
5. Exams: 1-3 Objective and problem solving exams, and 1 objective and/or problem solving final exam per semester

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.

Questions and interpreting working drawings	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.

Objective exams and problem solving exams 1-3 per semester, and 1 objective and/or problem solving 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:

Basic Blueprint Reading and Sketching, 8th edition, CT Olivo and AV Payne, Delmar, 2005
Blueprint reading for construction, JAS Fatzinger, Pearson, 2nd edition, 2005
Print Reading for Construction, 5th Edition, WC Brown, Goodheart-Wilcox, 2005
Construction Graphics: Practical Guide to Interpreting Working Drawings 2nd Edition, KA Bishart, John Wiley, 2008
Print Reading for Architecture and Construction, 2nd Edition, D Madsen, A Jeffries, Delmar, 2005

Understanding Construction Drawings, 5th Edition, MW Huth, Delmar, 2010
Instructor prepared materials