CNST A185: BUILDING CONSTRUCTION 2

Item	Value
Curriculum Committee Approval Date	12/02/2020
Top Code	095200 - Construction Crafts Technology
Units	5 Total Units
Hours	162 Total Hours (Lecture Hours 54; Lab Hours 108)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S)

Course Description

The study of roof design and cutting. The use of the framing square in roof layout. Pre-fabrication techniques in housing with field research assignments. Frame estimating for the building trades and the application of various roofing materials are also covered. ADVISORY: CNST A180 or entry level residential construction experience. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Calculate and lay out roof rafters.
2. Layout and assemble code compliant ceiling joist systems.
3. Assemble code compliant conventional rafter systems including eaves, frieze, verges and roof sheathing.
4. Assemble a simple engineered roof truss system.

Course Objectives

- 1. Identify the various roof shapes commonly found on residences
- 2. Demonstrate proficiency in the step-layout of roof rafters with the Framing Square.
- 3. Demonstrate proficiency in the calculation of roof rafters by use of the Pythagorean theorem, the Framing Square Tables, the Reicher Rafter Tables and with simple trigonometric functions.
- 4. Demonstrate proficiency in the calculation of roof rafters for unknown and bastard pitched roofs.
- 5. Demonstrate the ability to layout ceiling joist to tie with roof rafters from the building plans for the OCC Hodge Podge Lodge house and to meet the requirements of the building code
- 6. Construct the ceiling joist and conventional rafter system for a simple gable roof.
- 7. Construct the purlin support for the conventional rafter system of a simple gable roof.
- 8. Construct the ceiling joist and conventional rafter system for a Dutch gable roof and for a hip roof.
- 9. Apply the math necessary to calculate, layout and cut the framing components for the high volume flat top walls and ridge beam location for the OCC Hodge Podge Lodge house.
- 10. Construct the eave and verge overhangs of a conventional rafter system for a gable roof and a hip roof.
- 11. Apply roof sheathing and starter board on a conventional rafter system for a cathedral roof and a hip roof
- 12. Construct a California roof between the conventional rafter system of a gable roof and a hip roof.
- 13. Construct a dormer roof on a conventional gable roof.
- 14. Assemble an engineered roof truss system with a Dutch gable end and a hip end.
- 15. Recognize different roofing materials.
- 16. To apply asphalt roofing
- 17. Apply the regulations of the Building Codes in the construction of the OCC Hodge Podge Lodge.
- 18. Demonstrate many of the efficient framing practices of the southern California home building industry.

Lecture Content

Introduction policies and procedures Semester project and photo/slide/video presentation Roof math and nomenclature unit, line length, and shortening Line length by square root (big triangle method) and shortening Line length by step method (step-off method) Framing square tables (calculate line length by framing square multiplier) Line length calculated from Riecher rafter table book Layout and cutting procedure from common rafters Ceiling joist layout Gable roofs, ridges, ridge bracing, and nailing Gable ends, gable studs, rake walls, and blocking Purlin, collar ties, lapping rafters on purlin Dutch gable/hip and Plate line or Zero setback Dutch roofs Hips and Valleys unit, drop, line length, and shortening Ridge length of hip roof how to brace, chokers, and nailing Continuation hips and hips on square building Jack rafters, common difference, shortening, nailing, and how to install Discuss gang cutting hip jacks California valleys Add on tails, Fascia, starter board, and roof sheathing Shed roofs and dormers Framing square Essex board foot, brace table, and octagon scale Soffit construction (eave) and dropped ceilings Trusses loading, stacking, and backing Cricket or saddle Roofing material and application Special problems unequal pitched roofs, octagons

Lab Content

Faculty input required.

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- Lab (04)
- DE Live Online Lab (04S)

Instructional Techniques

Instruction methodologies will include, but not necessarily be restricted to, the following: 1. Detailed multimedia/lectures of each topic covered. 2. Student feedback during each lecture. 3. Detailed illustrative discussion of lecture handout and textbook information. 4. Building plan reading. 5. Full scale/size laboratory construction projects pertaining to subjects discussed during which students work individually and in small groups.

Reading Assignments

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Writing Assignments

Student must show math proficiency in board footage calculation, material estimating, and triangle solutions for framing component placements. Student must show proficiency in building plan reading, identification of residential construction components, and understanding of the Uniform Building Code.

Out-of-class Assignments

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Demonstration of Critical Thinking

Tests and quizzes; lab construction projects; estimating assignments; photo projects

Required Writing, Problem Solving, Skills Demonstration

Student must show math proficiency in board footage calculation, material estimating, and triangle solutions for framing component placements. Student must show proficiency in building plan reading, identification of residential construction components, and understanding of the Building Codes.

Eligible Disciplines

Construction technology: Any bachelor's degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required Koel, Leonard. Carpentry. , 6th ed. Los Angeles: : American Technical Publishers, 2013 Rationale: - 2. Required Riechers, A.F.J. . Full-Length Roof Framer, ed. . J. Reichers, 1995 Rationale: - 3. Required Stevens, J.P. Hodge Podge Lodge Blueprints/Building Plans, ed. Atlanta: : Mouse Graphics Blueprint Services, 1960 latest., 1960 Rationale: -