

BIT 324B: CALIFORNIA ENERGY CODES ENVELOPE & MECHANICAL

New Course Proposal

Date Submitted: Mon, 22 Jul 2019 22:32:10 GMT

Originator

zbecker

Co-Contributor(s)

Name(s)

Bitanga, Bert

Justification / Rationale

This course is Module 2 of 3 of a non-credit overlay version of BIT 24 California Energy Codes. The non-credit version provides vocational skills training opportunities to the incumbent workforce and those currently underemployed or unemployed. This module covers the building envelope and mechanical requirements of the California Energy Code.

Effective Term

Fall 2020

Credit Status

Noncredit

Subject

BIT - Building Inspection Technology

Course Number

324B

Full Course Title

California Energy Codes Envelope & Mechanical

Short Title

CA ENERGY CODES ENVELOPE

Discipline

Disciplines List

Building Codes and Regulations (Inspecting of construction, building codes, contractor training)

Modality

Face-to-Face

100% Online

Catalog Description

This course covers California's Building Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part 6), specifically the building envelope and mechanical requirements for both residential and non-residential construction.

Schedule Description

This course covers California's Building Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part 6), Building Envelope and Mechanical Requirements. Prerequisite: BIT 324A

Non-credit Hours

72

Lecture Units

0

Lab Units

0

In-class Hours

24

Out-of-class Hours

48

Total Course Units

0

Total Semester Hours

72

Override Description

Noncredit courses do not have lecture and lab. The out of class hours were adjusted to provide the same total as the equivalent credit course.

Prerequisite Course(s)

BIT 324A

Required Text and Other Instructional Materials**Resource Type**

Book

Open Educational Resource

Yes

Author

California Energy Commission

Title

[California] Building Energy Efficiency Standards for Residential and Nonresidential Buildings (latest version)

Edition

Latest Edition

Publisher

California Energy Commission (CEC)

Year

2019

College Level

Yes

Flesch-Kincaid Level

N/A

Class Size Maximum

28

Entrance Skills

Demonstrate an overview understanding of California Energy Codes

Requisite Course ObjectivesBIT 324A-Provide an overview of the need for California Energy Codes.

Entrance Skills

Identify needed compliance documents for various project scenarios.

Requisite Course Objectives

BIT 324A-Determine needed compliance documents for various project scenarios.

Course Content

1. Building Envelope Requirements - Fenestration (Windows, Skylights, Doors).
 - a. Compliance Options - Mandatory/Prescriptive/Performance.
 - b. Definitions and Terminology.
 - c. Fenestration - Windows, Skylights and Doors.
 - d. Orientation.
 - e. NFRC Labeling - U-factor / SHGC / VT.
 - f. Window Coatings.
 - g. Dynamic Glazing.
 - h. Daylighting / Sidelit Requirements and Controls.
 - i. Shading Devices - Interior/Exterior.
 - j. Sidelits.
2. Building Envelope Requirements- Opaque Surfaces (Walls, Roofs, Floors).
 - a. Compliance Options - Mandatory/Prescriptive/Performance.
 - b. R-Values and U- Factors.
 - c. Wall Assemblies - Wood Framing, Metal Framing, SIPS, ICF, AWS, Double and Staggered Wall Assemblies.
 - d. Field Applied Liquid Coatings.
 - e. Insulation Types and Characteristics.
 - f. Quality Insulation Installation (QII).
 - g. Attic Ventilation and Radiant Barriers.
 - h. Cool Roof Ratings- CRRC.
 - i. High Performance Attics (HPA).
 - j. High Performance Walls (AWS).
 - k. Reduced Building Air Leakage.
 - l. Floor Assemblies - Slab on Grade, Raised Floor, Crawlspace, Thermal Mass.
3. Building Mechanical HVAC Residential Requirements.
 - a. Common System Types.
 - b. Title 20 - California Appliance Regulations.
 - c. Mandatory Measures.
 - d. Design Conditions.
 - e. Equipment Sizing.
 - f. Heating Equipment.
 - g. Cooling Equipment.
 - h. Installation Requirements - Insulation, Clearances.
 - i. System Performance.
 - j. Air Distribution System - Ducts, Plenums, and Fans.
 - k. Air Filtration - Filter Media.
 - l. Zonally Controlled Systems.
 - m. Thermostats/Controls.
 - n. HERS Field Verification and Diagnostic Testing.
 - o. Alternative Systems - Hydronic, Radiant Floor, Ground Source Heat Pump, Ice Storage, Non-Ducted.
4. Building Mechanical HVAC Non-Residential Requirements.
 - a. Common System Types.
 - b. Title 20 - California Appliance Regulations.
 - c. Mandatory Measures.
 - d. Design Conditions.

- e. Equipment Sizing.
- f. Heating Equipment.
- g. Cooling Equipment.
- h. Pipe and Duct Distribution Systems.
 - i. Ventilation Requirements.
 - j. Economizers, FDD, DCV, VFD.
- k. HVAC System Control Requirements.
 - l. Thermostats.
- m. HERS Field Verification and Diagnostic Testing - Non-Res.
 - n. Mechanical Plan Check Documents.
 - o. Mechanical Acceptance Testing and Compliance Documentation.
- 5. Residential Indoor Air Quality (IAQ).
 - a. ASHRAE 62.2.
 - b. Residential IAQ Methods of Compliance.
 - c. Calculating IAQ Requirements.
 - d. ERV and HRV Systems.
 - e. Mechanical Exhaust Ventilation (IAQ) - Local/ Intermittent / Continuous / Controls.
 - f. Whole House Ventilation - Climate Zones, Calculations, Methods.

Course Objectives

	Objectives
Objective 1	Apply CA Energy Codes in Building Envelope and Mechanical construction, regulation, and design.
Objective 2	Determine needed compliance documents for various building envelope and mechanical project scenarios.
Objective 3	Demonstrate skills for employment in private or public construction fields, or become inspector or plans examiners.
Objective 4	Collect pertinent data for compliance needs.
Objective 5	Provide pertinent information for completion, submission, and registration of compliance documents.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Identify the components of the Building Energy Efficiency Standards (Title 24, Section 6) and supporting documents for Building Envelope and Mechanical Requirements.
Outcome 2	Identify the requirements and methods of meeting energy code compliance, and building simulation requirements for Building Envelope and Mechanical Requirements.
Outcome 3	Examine the energy efficiency of a proposed design and construction of a building.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Lecture	Presentation of topic in context.
Individualized Study	Critical thinking analysis of energy code situations and requirements.
Discussion	Classroom and group discussions of energy code examples.
Technology-based instruction	Research of energy codes online.
Participation	Class discussion and questions on energy code applications.

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Self-paced testing, Student preparation	Research appropriate energy codes for a residential construction situation and create a 10-minute presentation on your recommended solution and on the research you used to arrive at the solution.	Out of Class Only
Student participation/contribution	Classroom and group discussions of energy code examples.	In Class Only

Presentations/student demonstration observations	Presentation of energy code research preparation.	In Class Only
Student participation/contribution	Participation in individual and group discussion of presentations with critical analysis of solution and methods presented verbally in class and as a written report out-of-class.	In and Out of Class
Tests/Quizzes/Examinations	Quizzes with answers provided to be completed out-of-class and discussed in-class.	In and Out of Class
Mid-term and final evaluations	Comprehensive exam covering all content of the course. Exam may be project based to be completed out-of-class or multiple choice to be completed in-class.	In and Out of Class
Other	Out-of-class hours will be accounted for electronically through the learning management system.	Out of Class Only

Assignments

Other In-class Assignments

1. Presentation of course subjects and materials.
2. Review code sections.

Other Out-of-class Assignments

1. Reading assignments of codes and handouts.
2. Visit construction sites (actual and virtual).
3. Review code sections presented in class.

Grade Methods

Pass/No Pass Only

Distance Education Checklist

Instructional Materials and Resources

If you use any other technologies in addition to the college LMS, what other technologies will you use and how are you ensuring student data security?

The college LMS will be the only technology used to hold student data.

If used, explain how specific materials and resources outside the LMS will be used to enhance student learning.

The resources below are needed for energy code assignments and they are all professional and exclusive websites that focus on the subject matter.

1. energy.ca.gov
2. (AHRl) Air conditioning HeatingRefrigeration Institute
3. (CEC) California Energy Commission
4. Building Standards Commission bsc.ca.gov
5. NFRC National Fenestration Rating Council

Effective Student/Faculty Contact

Which of the following methods of regular, timely, and effective student/faculty contact will be used in this course?

Within Course Management System:

Timely feedback and return of student work as specified in the syllabus
 Discussion forums with substantive instructor participation
 Private messages
 Online quizzes and examinations
 Weekly announcements

External to Course Management System:

Direct e-mail
 Synchronous audio/video
 Telephone contact/voicemail

Briefly discuss how the selected strategies above will be used to maintain Regular Effective Contact in the course.

Through group discussions, email correspondence, voicemail

If interacting with students outside the LMS, explain how additional interactions with students outside the LMS will enhance student learning.

None

Other Information

Provide any other relevant information that will help the Curriculum Committee assess the viability of offering this course in an online or hybrid modality.

Background information: Title 24 is a state legislative mandate instated in the mid to late 1970's to reduce California's energy consumption.

It is mandatory for any residential and commercial, new or remodel project that requires a permit approval. Viability: Because Title 24 energy analysis report is such a prevalent factor in the process of attaining a building permit, and due to the fact that these Energy Codes are the newest in the series of BIT codes, the demand will be high. Individuals in the professional industry (contractors, building inspectors, plans examiners, architects, engineers, and city agency employees) will need to enroll in this course to remain current with updated standards. 3. By 2020, all new residential construction will be required to be ZNE ready and by 2030, all new commercial construction will be required to be ZNE

ready. One requirement to be ZNE ready is to have a valid and proper Title 24 energy analysis report available for submittal. This course covers all the necessary information explained in the California Energy Commission (CEC) and this course in a distance educational modality will be a model for other community colleges in California.

MIS Course Data

CIP Code

46.0403 - Building/Home/Construction Inspection/Inspector.

TOP Code

095720 - Construction Inspection

SAM Code

C - Clearly Occupational

Basic Skills Status

Not Basic Skills

Prior College Level

Not applicable

Cooperative Work Experience

Not a Coop Course

Course Classification Status

Other Non-credit Enhanced Funding

Approved Special Class

Not special class

Noncredit Category

Short-Term Vocational

Funding Agency Category

Not Applicable

Program Status

Program Applicable

Transfer Status

Not transferable

Allow Audit

No

Repeatability

Yes

Repeatability Limit

NC

Repeat Type

Noncredit

Justification

Noncredit courses are repeatable until students achieve the skills and competencies required to meet the objectives and outcomes of the course.

Materials Fee

No

Additional Fees?

No

Approvals**Curriculum Committee Approval Date**

10/17/2019

Academic Senate Approval Date

10/24/2019

Board of Trustees Approval Date

11/13/2019

Chancellor's Office Approval Date

01/10/2020

Course Control Number

CCC000611549

Programs referencing this course

California Energy Codes Certificate of Completion (<http://catalog.collegeofthedesert.eduundefined?key=242/>)