BIT 324C: CALIFORNIA ENERGY CODES WATER & LIGHTING

New Course Proposal

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Originator

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Co-Contributor(s)

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Justification / Rationale

This course is Module 3 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 includes Water heating, Residential Lighting, Solar, Non-residential Lighting, Sign Lighting and Electrical Power Distribution, and Addition and Alteration Energy Requirements.

Effective Term

Fall 2020

Credit Status

Noncredit

Subject

BIT - Building Inspection Technology

Course Number

324C

Full Course Title

California Energy Codes Water & Lighting

Short Title

CA ENERGY CD WATER/LIGHT

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 for Water and Lighting; Additions and Alterations.

Schedule Description

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

Non-credit Hours

54

Lecture Units

0

Lab Units

0

In-class Hours
18

Out-of-class Hours
36

Total Course Units
0

Total Semester Hours
54

Override Description
Noncredit does not have lecture and lab.

Prerequisite Course(s)
BIT 324B

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

Year
2019

College Level
Yes

Flesch-Kincaid Level
N/A

Resource Type
Book

Author
California Building Standards Commission

Title
[California] Reference Appendices: Joint Appendices, Residential Appendices, Nonresidential Appendices (latest version)

Edition
Latest Edition

Publisher
International Code Council

Year
2019

College Level
Yes

Flesch-Kincaid Level
N/A

Class Size Maximum
28

Entrance Skills
Apply CA Energy codes in building envelope and mechanical construction regulation and design

Requisite Course Objectives
BIT 324B-Apply CA Energy Codes in Building Envelope and Mechanical construction, regulation, and design

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Entrance Skills
Provide pertinent information for completion, submission, and registration of compliance documents.

Requisite Course Objectives
BIT 324B-Provide pertinent information for completion, submission, and registration of compliance documents.

Entrance Skills
Collect pertinent data for compliance needs.

Requisite Course Objectives
BIT 324B-Collect pertinent data for compliance needs.

Course Content

1. Water Heating Requirements.
   a. Overview.
   b. Mandatory Requirements for Water Heaters.
   c. Water Heating Equipment.
   d. Instantaneous Gas Water Heaters.
   e. Combined Hydronic System.
   f. Distribution Systems - Parallel Piping, Demand Recirculation/ Auto and Manual On, Compact Design, Point of Use, Pipe Insulation.
   g. Multi-family, Motel/Hotels and High-Rise Residential.
   h. Field Verification of Water Heating Systems.
   i. Solar Water Heating.
   j. Swimming Pool and Spa Heating.
   k. Shower Heads and Faucets - CALGreen Code.
2. Residential HERS Verification, Testing, and Documentation Procedures-Residential Appendices RA1 - RA2 - RA3 - RA4.
   a. CA Home Energy Rating Systems.
   b. Summary of Measures.
   c. Field Verification, Diagnostic Testing, and Certificate of Installation.
   d. HERS Procedures - Duct Measures.
   e. HERS Procedures - Air Conditioning Measures.
   f. HERS Procedures - Mechanical Ventilation Measures: IAQ.
   g. HERS Procedures - Building Envelope Measures: QII, Building Air Leakage, Blower Door.

   h. HERS Procedures - Single Family Domestic Hot Water Measures.
   i. HERS Procedures - Multi-Family Domestic Hot Water Measures.
   j. HERS Documentation Registration.
3. Lighting and Controls
   a. Mandatory Requirements for Lighting Control Devices and Systems, Ballasts, and Luminaires
   b. Lighting Controls
   c. Nonresidential Lighting and Controls
   d. Nonresidential Outdoor Lighting Controls and Equipment
   e. Sign Lighting Controls and Internally/Externally Illuminated Signs
   f. Lighting Control Acceptance and Installation Requirements
   g. Electrical Power Distribution Systems
   h. Energy Management Control Systems (EMCS)
   i. Lighting Power Density (LPD)- Complete Bldg, Area, and Tailored methods
   j. Power Adjustment Factor
   k. Automatic Daylighting
   l. Sidelighting - Primary and Secondary
   m. Lighting Acceptance Testing and Compliance Documentation
4. Solar Ready
   a. Overview
   b. Covered Occupancies
   c. Solar Zone - Min. Area, Orientation, Shading
   d. Construction Documents
   e. NSHP
5. Additions and Alterations in Existing Low-rise Residential Buildings
   a. Prescriptive Approach
   b. Water Heating
   c. Fenestration
   d. Space Conditioning Systems
   e. Duct Systems - Duct Sealing
   f. Roofs
   g. Lighting
   h. Performance Approach
6. Compliance Documents
   a. Residential Forms (Over 100 forms)
   b. Non-Residential Forms (Approx. 100 forms)
   c. Navigating Compliance Forms
   d. Understanding Compliance Forms
   e. Acceptance Requirements

Course Objectives

	Objectives
Objective 1	Apply the CA Energy Codes for Water Heating and Lighting in construction, regulation, and design.
Objective 2	Determine needed compliance documents for various project scenarios in Water Heating, Lighting, Alterations, and Additions.
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 Water Heating and Lighting.

Outcome 2	Identify the requirements and methods of meeting energy code compliance, and building simulation requirements in Water Heating and Lighting.
Outcome 3	Examine the energy efficiency of a proposed design and construction of a building from the perspective of Water Heating, Lighting, Additions and Alterations.

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.
Demonstration, Repetition/Practice	Multiple examples of energy code requirements and need for compliance.
Discussion	Active participation in individual and group evaluation of code examples.
Technology-based instruction	Online research of energy codes to determine potential solutions to construction examples.
Participation	Classroom and group discussions.

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 the lighting on a residential construction project and create a 10-minute presentation on your recommended solution and the research justifying the solution.	Out of Class Only
Student participation/contribution	Present researched topic and participate in group evaluation and critique.	In Class Only
Mid-term and final evaluations	Comprehensive exams covering all content of the course. Exams may be project based out-of-class assignments or multiple choice in-class questions.	In and Out of Class
Tests/Quizzes/Examinations	Timed quizzes to be completed out-of-class with discussion of correct answers in-class.	In and Out of Class
Computational/problem-solving evaluations	Critique peer presentations on energy code examples.	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.
3. Examples of code applications.
4. Examples of code violations.

Other Out-of-class Assignments

1. Reading assignments of codes and handouts.
2. Visit construction sites (real 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. (AHRI) 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 early 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 a Title 24 energy analysis report is such a prevalent factor in the process of attaining a building permit, and due to the fact that this course is the newest in the series of BIT courses, 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 education 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
CCC000611550

Programs referencing this course
California Energy Codes Certificate of Completion (http://catalog.collegeofthedesert.eduundefined?key=242/)