COLLEGE OF THE DESERT

Course Code ESYS-022

Course Outline of Record

1. Course Code: ESYS-022
2. a. Long Course Title: Residential Energy Modeling Design Project
   b. Short Course Title: ENERGY MODELS
3. a. Catalog Course Description:
   This course provides training in applying the principle techniques of energy modeling software to residential buildings. Students with a major or interest in architecture, drafting, landscape design, energy engineering, mechanical engineering, electrical engineering, or environmental engineering, will select specialized projects, with the approval of their professor, to model energy usage using Californian Energy Commission approved software.
   b. Class Schedule Course Description:
   This course provides training in applying the principle techniques of energy modeling software to residential building.
   c. Semester Cycle (*if applicable*): *N/A*
   d. Name of Approved Program(s):
   - ENERGY SYSTEMS TECHNOLOGY Certificate of Achievement
4. Total Units: 2.00 Total Semester Hrs: 72.00
   Lecture Units: 1 Semester Lecture Hrs: 18.00
   Lab Units: 1 Semester Lab Hrs: 54.00
   Class Size Maximum: 22 Allow Audit: No
   Repeatability 0x
   Justification 0
5. Prerequisite or Corequisite Courses or Advisories:
   Course with requisite(s) and/or advisory is required to complete Content Review Matrix (CCForm1-A)
   Prerequisite: ESYS 021
6. Textbooks, Required Reading or Software: *(List in APA or MLA format.)* *N/A*
7. Entrance Skills: *Before entering the course students must be able:*

a.
Describe the technics and methods necessary to show compliance with the California Energy Standards.

- ESYS 021 - Describe the technics and methods necessary to show compliance with the California Energy Standards.

b.
Describe the energy modeling features of a building, including their characteristics and function.

- ESYS 021 - Describe the energy modeling features of a building, including their characteristics and function.

c.
Describe the heat transfer characteristics of building construction assemblies and how they perform, both individually and as an integrated part of a whole building system.

- ESYS 021 - Describe the heat transfer characteristics of building construction assemblies and how they perform, both individually and as an integrated part of a whole building system.

d.
Collect and analyze building and energy efficiency data from plan set take-offs or on-site field inspections.

- ESYS 021 - Collect and analyze building and energy efficiency data from plan set take-offs or on-site field inspections.

e.

Determine if the proposed building construction, design, and installation meet mandatory code requirements.

- ESYS 021 - Determine if the proposed building construction, design, and installation meet mandatory code requirements.

f.
Describe energy compliance software approved by the California Energy Commission (CEC).

- ESYS 021 - Describe energy compliance software approved by the California Energy Commission (CEC).

g.
Demonstrate the energy modeling skills needed to create a computer-generated certified energy analysis report.

- ESYS 021 - Demonstrate the energy modeling skills needed to create a computer generated certified energy analysis report.

h.
Make sound recommendations for energy efficient and cost-effective building design.

- ESYS 021 - Make sound recommendations for energy efficient and cost-effective building design.

i.
Determine needed compliance documents for various project scenarios and provide needed information for completion, submission, and registration.

- ESYS 021 - Determine needed compliance documents for various project scenarios and provide needed information for completion, submission, and registration.

8. Course Content and Scope:

Lecture:

1.Project type and scope will be determined by the instructor and must be applicable to the student's major course of study.

2.Small group discussions on the lecture items, above, related to energy modeling. This will exercise each students' vocabulary and concepts related to buildings and their energy systems so that they grow in their abilities to explain what they have learned.

3.Interactive demonstrations of real project cases of building energy modeling to give students the feeling for how they actually should work in the field.

Lab: *(if the "Lab Hours" is greater than zero this is required)*

1.Produce Takeoffs from a full set of building plans.

2.Apply California Energy code.

3.Apply California energy compliance software to specify projects.

4.Presentations of student projects

9. Course Student Learning Outcomes:

1.
Compare and document buildings from construction plans using the latest energy compliance software.

2.
Apply the principle of energy modeling software to residential buildings.

10. Course Objectives: *Upon completion of this course, students will be able to:*
    a. Model and document buildings from construction plans using the latest energy compliance software.
    b. Be better prepare to take industry recognize credentials e.g. Certified Energy Analyst (CEA).
    c. Explain the two common building design methods, prescriptive and performance to comply with California energy code.
    d. Understand the dangers of not back checking and scaling final energy calculation results.
    e. Use energy terminology appropriately when discussing energy trade offs.

11. Methods of Instruction: *(Integration: Elements should validate parallel course outline elements)*
    a. Collaborative/Team
    b. Demonstration, Repetition/Practice
    c. Discussion
    d. Individualized Study
    e. Laboratory
    f. Lecture
    g. Observation
    h. Participation
    i. Self-exploration

12. Assignments: *(List samples of specific activities/assignments students are expected to complete both in and outside of class.)*
    In Class Hours: 72.00
    Outside Class Hours: 36.00
    a. In-class Assignments
       1.Reading assignments
       2.Quizzes
       3.Tests
       4. Discussion of energy models
    b. Out-of-class Assignments
       1.Practice tutorial energy models.
       2.Read assigned text.
       3.Assigned worksheets.
       4.Evaluate an energy bill.
       5.Evaluate energy rebates and incentives.
       6.Prepare for in-class discussions on specific energy topics.

13. Methods of Evaluating Student Progress: *The student will demonstrate proficiency by:*
    - Laboratory projects
    - Group activity participation/observation
    - True/false/multiple choice examinations
    - Mid-term and final evaluations
    - Student participation/contribution
    - Student preparation
    - Organizational/timelines assessment

14. Methods of Evaluating: Additional Assessment Information:

15. Need/Purpose/Rationale -- *All courses must meet one or more CCC missions.*
    PO - Career and Technical Education
    Fulfill the requirements for an entry- level position in their field.
    Apply critical thinking skills to execute daily duties in their area of employment.
    Apply critical thinking skills to research, evaluate, analyze, and synthesize information.
    Display the skills and aptitude necessary to pass certification exams in their field.

Exhibit effective written, oral communication and interpersonal skills.

IO - Critical Thinking and Communication

Apply principles of logic to problem solve and reason with a fair and open mind.

Apply standard conventions in grammar, mechanics, usage and punctuation.

16. Comparable Transfer Course

University System	Campus	Course Number	Course Title	Catalog Year

17. Special Materials and/or Equipment Required of Students:

18. Materials Fees: ☐ Required Material?

Material or Item	Cost Per Unit	Total Cost

19. Provide Reasons for the Substantial Modifications or New Course:
Add distance education modality.

20. a. Cross-Listed Course *(Enter Course Code)*: *N/A*
b. Replacement Course *(Enter original Course Code)*: *N/A*

21. Grading Method *(choose one)*: Letter Grade Only

22. MIS Course Data Elements
a. Course Control Number [CB00]: CCC000587605
b. T.O.P. Code [CB03]: 94610.00 - Energy Systems Technology
c. Credit Status [CB04]: C - Credit - Not Degree Applicable
d. Course Transfer Status [CB05]: C = Non-Transferable
e. Basic Skills Status [CB08]: 2N = Not basic skills course
f. Vocational Status [CB09]: Clearly Occupational
g. Course Classification [CB11]: Y - Credit Course
h. Special Class Status [CB13]: N - Not Special
i. Course CAN Code [CB14]: *N/A*
j. Course Prior to College Level [CB21]: Y = Not Applicable
k. Course Noncredit Category [CB22]: Y - Not Applicable
l. Funding Agency Category [CB23]: Y = Not Applicable
m. Program Status [CB24]: 1 = Program Applicable

Name of Approved Program *(if program-applicable)*: ENERGY SYSTEMS TECHNOLOGY
Attach listings of Degree and/or Certificate Programs showing this course as a required or a restricted elective.)

23. Enrollment - Estimate Enrollment
First Year: 18
Third Year: 22

24. Resources - Faculty - Discipline and Other Qualifications:
a. Sufficient Faculty Resources: Yes
b. If No, list number of FTE needed to offer this course: *N/A*

25. Additional Equipment and/or Supplies Needed and Source of Funding.
N/A

26. Additional Construction or Modification of Existing Classroom Space Needed. *(Explain:)*
N/A

27. FOR NEW OR SUBSTANTIALLY MODIFIED COURSES
Library and/or Learning Resources Present in the Collection are Sufficient to Meet the Need of the Students Enrolled in the

Course: Yes

28. Originator Ramiro Galicia Origination Date 02/08/18