REEN 103 Course Outline as of Summer 2025

CATALOG INFORMATION

Dept and Nbr: REEN 103 Title: GRID TIE RES PV BASICS
Full Title: Basics of Grid Tie Residential Systems
Last Reviewed: 11/25/2019

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	3.00	Lab Scheduled	3.00	6	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00 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:	RENRG 103

Catalog Description:
An introductory level integrated lab-lecture course to provide knowledge and skills needed to understand the relationships between designing, installing, and selling a typical residential grid tie solar photovoltaic (PV) system.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 100 OR EMLS 100 (formerly ESL 100) and completion of MATH 150 or equivalent

Limits on Enrollment:

Schedule of Classes Information:
Description: An introductory level integrated lab-lecture course to provide knowledge and skills needed to understand the relationships between designing, installing, and selling a typical residential grid tie solar photovoltaic (PV) system. (Grade Only)
Prerequisites/Corequisites:
Recommended: Eligibility for ENGL 100 OR EMLS 100 (formerly ESL 100) and completion of

MATH 150 or equivalent
Limits on Enrollment:
Transfer Credit:
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:	Effective:	Inactive:
UC Transfer:	Effective:	Inactive:

CID:

Certificate/Major Applicable:
Certificate Applicable Course

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Determine appropriate solar technologies for a given site.
2. Utilize shade analysis and clearance requirements for optimal placement and orientation of solar arrays on roof or ground installations.

Objectives:
At the conclusion of this course, the student should be able to:
1. Describe phases of a solar PV project from initial customer contact to completion.
2. Analyze a site to determine the best location to install a system.
3. Describe mounting methods on different roofing materials and soil types.
4. Document how storage systems can benefit a solar project.

Topics and Scope:

I. Utility Structures, Rate Schedules and Energy Savings
   A. Overview of utility companies
   B. Consumer utility rate schedules
   C. Electric bill interpretation
   D. Distributed-generation versus centralized-utility models
   E. System sizing based on customer current and future use
II. Fire Clearances and Permitting Issues
   A. Relevant building and fire codes
   B. The permitting process
III. Electrical Storage System Design
   A. Suitable applications and conditions
   B. Battery types
IV. Basic Electrical Components

A. Conduit design
B. Inverters and rapid shut-down devices
C. Disconnects
D. Monitoring components

V. Roof-Mounted Systems
A. Modifications to existing roofs
B. Attachment components and methods
C. Installation for new roofs

VI. Basics of Ground-Mounted Systems
A. Foundation systems
B. Racking systems

VII. Electrical Loads
A. Determination of critical loads
B. Evaluation of future loads
C. Evaluating suitability of existing electrical system

VIII. System Aesthetics
A. Ground-mounted versus roof-mounted systems
B. System visibility and aesthetics

IX. Basic Site Safety and Staging

X. Site Planning
A. Shade analysis
B. Roof tilt and orientation
C. Roof-mounting versus ground-mounting

XI. Ethics and Customer Service
A. Responding to questions or requests from customers
B. Site preparation and use of tarps, furniture covers, and walkway linings
C. Service tips to leave a favorable, memorable impression with customers
D. Quality system installations
E. Preparation for the final departure of a project site
F. System monitoring

The above Topics and Scope apply to both lecture and lab course components in an integrated format.

Assignment:

1. Assigned readings (10-30 pages per week)
2. Problem sets and tasks (6-20)
3. Quizzes (5-10)
4. Midterm exam
5. Final exam

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.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.	Writing 0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Problem sets and tasks	Problem solving 30 - 60%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None	Skill Demonstrations 0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Quizzes, midterm and final	Exams 30 - 60%

Other: Includes any assessment tools that do not logically fit into the above categories.

Participation	Other Category 0 - 10%

Representative Textbooks and Materials:
Photovoltaic Systems. 3rd ed. Dunlop, James. American Technical Publishers. 2012 (classic)
Instructor prepared materials