

ESYS 034: LIGHTING EFFICIENCY TECHNOLOGY

Originator

rgalicia

Co-Contributor(s)**Name(s)**

Brown, George

Justification / Rationale

This course is for students engaged in a lighting-related field with a need for knowledge and skills in lighting function and design of solar lighting. The coordination between trades, design limitations, and workflow processes will be explained. The fundamental principles and functions of the lighting industry will be introduced. Students will be prepared to work as site planning technicians or lighting sales advisors. This course is developed to meet the goals of the California Energy Efficiency Strategic Plan (CEESP) which mandates that 100 percent of all new homes in California will be Zero Net Energy starting in 2020 and 50 percent of commercial buildings by 2030. Solar technology is the leading technology used to offset electrical demand from the power grid. California has acknowledged the shortage of a qualified and available workforce to meet these new mandates. This course is designed to develop the highly trained technical workforce necessary to meet the goals of the California Energy Efficiency Strategic Plan (CEESP).

Effective Term

201930

Credit Status

Credit - Degree Applicable

Subject

ESYS - Energy Systems Technology

Course Number

034

Full Course Title

Lighting Efficiency Technology

Short Title

LIGHTING EFFICIENCY

Discipline**Disciplines List**

Industrial Technology (Foundry occupations)

Construction Technology

Modality

Face-to-Face

Catalog Description

This course will review the current technology in energy efficient lighting controls and systems; the latest advances in lamp, ballast, luminaire and control technologies, as well as recent developments in energy legislation.

Schedule Description

This course will review the current technology in energy efficient lighting controls and systems; the latest advances in lamp, ballast, luminaire and control technologies, as well as recent developments in energy legislation.

Advisory: ESYS 005

Lecture Units

3

Lecture Semester Hours

54

Lab Units

0

In-class Hours

54

Out-of-class Hours

108

Total Course Units

3

Total Semester Hours

162

Prerequisite Course(s)

Advisory: ESYS 005

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

Web/Other

Open Educational Resource

Yes

Class Size Maximum

30

Entrance Skills

Define energy and name of its source.

Prerequisite Course Objectives

ESYS 005-Define energy and name of its source.

Entrance Skills

Identify the different methods of converting energy into electricity.

Prerequisite Course Objectives

ESYS 005-Identify the different methods of converting energy into electricity.

Entrance Skills

Explain how electricity is transmitted and distributed.

Prerequisite Course Objectives

ESYS 005-Explain how electricity is transmitted and distributed.

Entrance Skills

Describe energy efficient rating systems, SEER EER, part load EER and COP.

Prerequisite Course Objectives

ESYS 005-Describe energy efficient rating systems, SEER EER, part load EER and COP.

Entrance Skills

Describe HVAC systems used in ZNE buildings.

Prerequisite Course Objectives

ESYS 005-Describe HVAC systems used in ZNE buildings.

Entrance Skills

Describe construction flaws and air leakage.

Prerequisite Course Objectives

ESYS 005-Describe construction flaws and air leakage.

Entrance Skills

Explain different methodologies in building construction.

Prerequisite Course Objectives

ESYS 005-Explain different methodologies in building construction.

Course Content

1. Fundamentals of Light and Lighting
2. Lighting Quality
3. Evaluating Lighting Systems
4. Environmental Concerns
5. Lamps
6. Ballasts
7. Luminaire Efficiency
8. Lighting Controls to Reduce Lighting Power
9. Lighting Calculations
10. Lighting Economics
11. Maintaining Lighting Systems

Course Objectives

	Objectives
Objective 1	Examine the latest lighting products for building applications.ramir
Objective 2	Evaluate lighting control plans for effectiveness and identify common design pitfalls.
Objective 3	Determine maximum electrical cost savings using lighting calculations.
Objective 4	Describe and explain ways to mitigate the environmental impact of wasted energy in the lighting industry.
Objective 5	Create several options for lighting investments that highlight payback calculations.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Demonstrate application of building lighting codes in compliance with lighting efficiency standards.
Outcome 2	Perform lighting calculations to obtain proper light levels.
Outcome 3	Evaluate environmental impacts of lighting efficiency projects.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Collaborative/Team	Group projects.
Demonstration, Repetition/Practice	Role play customer and technician interactions to introduce solar terminology.
Lecture	Lecture and class discussion on the process, flow and the coordination in lighting design.
Participation	Reading assigned chapters. Complete chapter reviewed questions and discussed next class session in a group setting.

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Tests/Quizzes/Examinations	True/False online and/or written quiz covering chapter material.	In Class Only
Mid-term and final evaluations	Written multiple choice examination covering material discussed throughout the course.	In Class Only
Computational/problem-solving evaluations	Review of return on investment (ROI)	In and Out of Class
Product/project development evaluation	review and present solution base projects to show a reductions of energy used in buildings.	In and Out of Class
Presentations/student demonstration observations	Demonstrate finding for a given project.	In and Out of Class

Assignments
Other In-class Assignments

1. Reading from textbooks
2. Research of specialty items
3. Problem-solving
4. Participate in collaboration
5. Team group projects
6. Participate in open forums discussion on California lighting code.

Other Out-of-class Assignments

1. Reading from textbooks
2. Research of specialty lighting controls
3. Complete assigned home problems and prepare to discuss during the next class session.
4. Individual and group project will be assigned to evaluate and determine alternative lighting solutions to reduce energy consumption.

Grade Methods

Letter Grade Only

MIS Course Data
CIP Code

15.0503 - Energy Management and Systems Technology/Technician.

TOP Code

094610 - Energy Systems Technology

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

Credit Course

Approved Special Class

Not special class

Noncredit Category

Not Applicable, Credit Course

Funding Agency Category

Not Applicable

Program Status

Program Applicable

Transfer Status

Not transferable

Allow Audit

No

Repeatability

No

Materials Fee

No

Additional Fees?

No

Files Uploaded**Attach relevant documents (example: Advisory Committee or Department Minutes)**

ZNE Meeting Minutes 031618.docx

ZNE Meeting Minutes 012017.docx

ZNE Meeting Minutes 012216.docx

ESYS 034 Approval Letter.pdf

Approvals**Curriculum Committee Approval Date**

10/02/2018

Academic Senate Approval Date

10/11/2018

Board of Trustees Approval Date

11/14/2018

Chancellor's Office Approval Date

11/26/2018

Course Control Number

CCC000598475

Programs referencing this courseBuilding Energy Systems Professionals (BESP) AS Degree (<http://catalog.collegeofthedesert.eduundefined?key=202>)Lighting and Controls Technology Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=206>)Air Conditioning Refrigeration AS Degree (<http://catalog.collegeofthedesert.eduundefined?key=51>)