

INTD-2380: FUNDAMENTALS OF LIGHTING

Cuyahoga Community College

Viewing: INTD-2380 : Fundamentals of Lighting

Board of Trustees:

June 2023

Academic Term:

Fall 2023

Subject Code

INTD - Interior Design

Course Number:

2380

Title:

Fundamentals of Lighting

Catalog Description:

Principles and techniques of lighting design and application in interior space. Light measurement, sources, specifications, color and light, and proper terminology used to create an interior environment. Emphasis on color selection, color psychology, and how light affects color and design elements in interior spaces.

Credit Hour(s):

3

Lecture Hour(s):

2

Lab Hour(s):

3

Other Hour(s):

0

Requisites

Prerequisite and Corequisite

INTD-1111 Introduction to Interior Design, INTD-1120 Architectural Drafting for Interiors I, and INTD-2330 Interior Design Materials and Sources, or concurrent enrollment.

Outcomes

Course Outcome(s):

Assess an interior space and determine the type of lighting needed.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

- a. Evaluate an illuminated space.
- b. Recommend sources for light level calculations.
- c. Explain the process of calculating light levels.
- d. Identify the proper amount of light levels needed in a space.

Course Outcome(s):

Specify appropriate lighting for a residential and commercial space.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

- a. State the advantages of the light source specified.
- b. Recommend lighting resources and manufacturers.
- c. Discuss sustainable lighting practices.

Course Outcome(s):

Create reflected ceiling plans for a functional and aesthetically pleasing residential and commercial space.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

- a. Develop reflected ceiling plans with multiple solutions.
- b. Recall lighting and energy standards, codes, and regulations.
- c. Discuss lighting specifications with lighting industry professionals, manufacturers, and distributors.

Course Outcome(s):

Utilize proper terminology in lighting and design.

Essential Learning Outcome Mapping:

Oral Communication: Demonstrate effective verbal and nonverbal communication for an intended audience that is clear, organized, and delivered effectively following the standard conventions of that language.

Objective(s):

- a. Discuss lighting goals and objectives for a particular project with an electrician or industry professional.
- b. Discuss lighting specifications with lighting industry professionals, manufacturers and distributors.

Methods of Evaluation:

- a. Quizzes
- b. Midterm Examination
- c. Final Examination
- d. Critique of assigned projects and drawings
- e. Presentations

Course Content Outline:

- a. Fundamentals of lighting
 - i. Terminology
 - ii. Light levels
 - iii. Calculations
 - iv. Placement
 - v. Contrast
 - vi. Directional effects
 1. Brightness and Glare
 2. Reflectance
 - vii. Selection Considerations
- b. Lighting source
 - i. Natural Light
 - ii. Artificial Light

1. Incandescent Lamps
 2. Light-Emitting Diode (LED) Lamps
 3. Halogen Lamps
 4. Fluorescent Lamps
 5. High-Intensity Discharge (HID) Lamps
- c. Sustainable Lighting Practices
 - i. LEED Certification
 - ii. Energy Consumption
 - d. Lighting Codes and Regulations
 - i. Energy Codes and Standards
 - ii. Disposal Regulations
 - e. Lighting systems: uses, styles, resources, and manufacturers
 - i. Recessed Luminaires
 - ii. Surface-Mount Luminaires
 - iii. Suspended Luminaires
 - iv. Track Luminaires
 - v. Structural Luminaires
 - vi. Portable Luminaires
 - f. Lighting controls
 - i. Transformers
 - ii. Ballasts
 - iii. Switches
 - iv. Dimmers
 - g. Light and color
 - i. The color spectrum
 - ii. Color perception
 - iii. Color temperature
 - iv. Color rendering
 - v. Psychological factors
 - vi. Physiological factors
 - h. Design and layered lighting
 - i. Task lighting
 - ii. Ambient lighting
 - iii. Accent lighting
 - iv. Decorative lighting
 - i. Development of reflected ceiling plans (RCP), schedules, and legends
 - i. Commercial Considerations
 - ii. Residential Considerations

Resources

Winchip, Susan M. (2022) *Fundamentals of Lighting*, New York: Fairchild Publications.

Livingston, Jason. (2021) *Designing with Light: The Art, Science, and Practice of Architectural Lighting Design*, Wiley.

Karlen, Mark, James Benya, and Christina Sprangler. (2017) *Lighting Design Basics*, Hoboken: Wiley & Sons.

Reed, Ron. (2021) *Color Plus Design: Transforming Interior Space*, Fairchild Books.
