

ARC 482: ENVIRONMENTAL DESIGN II: LIGHTING & ACOUSTICS 3 credits

Course Description: This course provides a comprehensive overview of the luminous and sonic environment with emphasis on energy conscious design. Not for graduate credit. Co-requisite: ARC452. Prerequisites: PHYS 203B, 253B. Restricted to major.

Course Goals and Objectives:

Upon completion of this course, the student will:

1. Develop an awareness of the historical basis for natural and electric lighting.
2. Develop an awareness of the psychological impact of light in the built environment.
3. Develop an awareness of vision and perception.
4. Develop in-depth knowledge of daylighting design techniques.
5. Develop in-depth knowledge of light sources.
6. Develop in-depth knowledge of light measurement.
7. Be able to perform lighting calculations.
8. Gain knowledge in the manipulation of light and form.
9. Gain basic knowledge of lamp and luminaire efficacy, the energy code, and sustainability issues relative to lighting design.
10. Gain an understanding of electrical principles, power distribution, and the National Electrical Code.
11. Design a luminous environment employing state-of-the-art lighting methods and equipment, energy producing/conserving systems, and renewable energy sources that contribute to ecological sustainability.
12. Develop a comprehensive lighting design plan.
13. Develop an understanding of basic acoustical phenomena, formulas, and calculations for controlling sound.

Student Performance Criteria:

B.3: Sustainable Design **B.8:** Environmental Systems

B.10: Building Envelope Systems **C.2:** Human Behavior

Topical Outline

Percentages of time

I. Historical Basis of Natural and Electric Lighting	1%
II. Psychological Impact of Light	3%
III. Vision and Perception	3%
IV. Daylighting and Design	15%
V. Light Sources	15%
VI. Light and Form	3%
VII. Light Measurement and Lighting Calculations	10%
VIII. The Energy Code and Sustainability Issues	5%

IX. Electrical Principles	10%	X.
Lighting Design	15%	XI.
The Sonic Environment	20%	

Textbooks:

Stein B., & J. Reynolds. *Mechanical and Electrical Equipment for Buildings*. 10th ed.
Hoboken, NJ: John Wiley & Sons, Inc. 2006.

Offered: Spring semester

Faculty: LaGarce