

MASTER SYLLABUS

COURSE NO., HOURS, AND TITLE: ID 482 - 3
Environmental Design II: Lighting and Acoustics

COURSE DESCRIPTION:

This course provides a comprehensive overview of the luminous and sonic environment with emphasis on energy-conscious design. Prerequisites: 391, MATH 111, PHYS 203a and b, and major in interior design or consent of school director.

PREREQUISITE TO: ID 491 - Interior Design Studio III

COURSE OBJECTIVES:

Upon completion of this course, the student will be able to:

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. 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. Develop a comprehensive lighting design plan.
12. Become acquainted with the use of computer-aided lighting design through the application of photometric software.

13. Develop an understanding of basic acoustical phenomena, formulas, and calculations for controlling sound.

TOPICAL OUTLINE:

Topics	Percentage 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%
A. Illuminance and creativity	
B. Daylighting strategies and sustainability issues	
C. Daylighting study models	
D. Daylighting calculations	
V. Light Sources	15%
A. Lamps	
B. Luminaires	
C. Efficacy	
VI. Light and Form	3%
VII. Light Measurement and Lighting Calculations	10%
A. Point method	
B. Lumen method	
VIII. The Energy Code and Sustainability Issues	5%
IX. Electrical Principles	10%
X. Lighting Design	15%
A. Programming	
B. Establishing goals	
C. Concept development	
D. Lighting plan	
E. Reflected ceiling plan	
F. Luminaire schedules	
G. Lighting software applications	

- H. Lighting specifications
- XI. The Sonic Environment 20%
 - A. Basic acoustical theory
 - B. Noise and vibrations
 - C. Room acoustics
 - D. Sound absorption
 - E. Sound isolation
 - F. Speech privacy
 - G. Natural ventilation and acoustics

TEXTBOOKS:

Required:

Stein, B., & Reynolds, J. (2000). Mechanical and electrical equipment for buildings. New York: Wiley.

Recommended:

Alexander, C. (1977). A pattern language. London: Oxford University Press.

Ander, G. (1995). Daylighting: Performance and design. New York: Wiley.

Ballast, D. (1988). Architect's handbook: Formulas, tables, mathematical calculations. Englewood Cliffs, NJ: Prentice Hall.

Buttiker, U. (1994). Louis I. Kahn: Light and space. New York: Whitney Library of Design.

Dadras, A. (1995). Electrical systems for architects. New York: McGraw-Hill Book Company.

Egan, D. (1983). Concepts in architectural lighting. (2nd ed.). New York: McGraw-Hill Book Company.

Egan, D. (1988). Architectural acoustics. New York: McGraw-Hill Book Company.

Farmer, B. & Louw, H. (1993). Companion to contemporary architectural thought. New York: Routledge.

Flynn, Kremers, Segil & Steffy. (1992). Architectural interior systems: Lighting, acoustics, air conditioning. New York: Wiley.

Lyndon, D. & Moore, C. (1994). Chambers for a memory palace. Cambridge, MA.: The MIT Press.

Mahnke, F. & Mahnke, R. (1987). Color and light in man-made environments. New York: Wiley.

Moyer, J. (1992). The landscape lighting book. New York: Wiley.

Riley, T. (1995). Light construction. New York: The Museum of Modern Art.

Smith, F., & Bertolone, F. (1986). Bringing interiors to light. New York: Whitney Library of Design.

Tanizake, J. (1977). In praise of shadows. New Haven, CT.: Leete's Island Books.

Watson, L. (1990). Lighting design handbook. New York: McGraw-Hill Book Company.