



# Lighting Design Seminar

Environmental Technology Elective  
ARC 6670 • 03 Credits

Spring 2024

*When you set out to work with the space of the sky or with light, you cannot mold and form it like clay. You have to use thought, almost like when you are working with sound. It should be really thought of as working with our perceptions, or developing our ways of seeing. My installations are in some ways analogous to the piano, which is quite a complex machine, but the sound that is produced by the piano has a life of its own and is what we hear in a piece of music. This puts us directly in touch with the sensual, its about sensing.*

James Turrell

*How would the painter or poet express anything other than his encounter with the world?*

Maurice Merleau-Ponty



## Introduction

Students will explore the relations among humans and light. Cultural interpretations (the poetics of light); historic light; perception of light (physiological and phenomenal); physical properties of light, interactions of light and surface (color and materiality); and the emergent contemporary electrical sources of light and control will be studied. Students will research a given existing office building in Manhattan and make a proposal for adaptive reuse as a residential structure. This will require significant modification to provide inspiring daylight while also redefining the structure, through light, as a noted landmark within Manhattan's urban context. Through course lectures, discussions and readings, students will develop qualitative language and quantitative tools for designing illuminated environments that invest 'light' as an expression of conceptual intention while reinforcing spatial design. Students will access these ideas through: the study of lighting precedents in architecture and theater; case-study analysis of noted lighting designs; the use of prediction tools such as physical models, computer models, lighting calculation estimates, and the implementation of design ideas as part of an integrated lighting design proposal. As Turrell suggests, we must utilize the architecture and tools of light but that must be in service of the visual music of light.

## Content

Lecture, seminar and project modes of learning are employed toward developing conceptual lighting design proposals. Field investigations, measurement and analysis of occupied spaces will be conducted to establish an experiential basis for lighting concepts. Precedent research on well-integrated architectural lighting projects will be conducted by students as part of a synthetic design proposal in order to draw out a wide range of design concepts and alternative lighting possibilities.



Students will research a given existing office building in Manhattan and make a proposal for adaptive reuse as a residential structure. This will require significant modification to provide inspiring daylight while also redefining the structure, through light, as a new landmark within Manhattan's dense urban fabric. Through course lectures, readings and discussions, students will develop qualitative language and quantitative tools for designing illuminated environments that invest 'light' as an expression of conceptual intention while reinforcing spatial design. Students will access these ideas through: the study of lighting precedents in architecture and theater; case-study analysis of noted lighting designs; the use of prediction tools such as physical models, computer models, lighting calculation estimates, and the implementation of design ideas as part of an integrated lighting design proposal. As Turrell suggests in his quote above, we must design with the architectural tools at hand to reveal light and form as visual music.

Velux Competition: <https://www.daylightandarchitecture.com/award-brief/>

### Course Structure

The seminar/studio course will include organized seminars, topical lectures, student presentation, open discussion and design collaboration where we will review and critique project proposals. Students will work individually and collaboratively to explore lighting issues through research and design toward a design scheme that is represented in computer and/or physical scale model studies, lighting calculations, architectural drawings, conceptual diagrams, and product specifications. Concept development will be guided by Illuminating Engineering Society Engineering Society (IES) lighting guidelines, individual research, site and program analysis, and course critiques. This iterative mode of inquiry, assimilation, and revision will carry the projects from conception through schematic design using drawings, product selections, and specifications to clarify design integration with architectural space, programmatic requirements, light distribution, light quality, and energy efficiency.

Field trips will be required as part of the course. Students will be asked to lead seminar discussions on lighting fundamentals and topical issues relevant to course research. Active participation in the discourse of the seminar format is critically important.

### Course Issues

- Conceptualization and Scheming – design process
- Light and Culture – theoretical and historical precedents
- Human interactions – physiological responses to light (emotive and qualitative properties)
- Physical properties of light
- Day light and electric light
- Lighting design criteria - basic requirements
- Design process – architectural schemes that incorporate design concept, architectural surface and lighting strategies
- Explorative design tools for speculative and critical inquiry – concept diagrams, physical models, and computer models.

## Design Applications

- Electrical light generation and efficiency - light and energy
- Metrics of lighting - measurements and ratings (luminance, illuminance, brightness, Color Rendering Index (CRI), Visual Comfort Probability (VCP) and Equivalent Spherical Illuminations (ESI)
- Light distribution and luminaire depreciation - Coefficient of Utilization (CU)
- Light measurement techniques
- Control systems, dynamic lighting and emergent technologies
- Refinement of design scheme through detailed physical or computer models and drawings
- Presentation of lighting design concepts and schemes

Reading assignments and course discussions will occur on a regular basis. Students are required to read and prepare points of discussion from the readings prior to the class meeting. Participation in the course discussions with regard to the reading material is required.

## Student Evaluation (grading)

As a seminar, consistent attendance and active topical contributions by students is necessary to inspire learning. Enthusiastic engagement will be rewarded in the final evaluations. Interim reading/discussion assignments will be given that will be included in the participation portion of the student evaluation. Projects (2) will comprise the remainder of performance evaluation.

Participation in discussions	20%
Phase 1: Precedent Research	30%
Phase 2: Design Intervention	50%
<b>Total</b>	<b>100%</b>

## Required Course Texts:

***IESNA Lighting Modules***. Access TBA.

***In Praise of Shadows***, Junichiro Tanizaki, et al. Leete's Island Books; 1988. ISBN: 0918172020. This text is under \$5.00 for a print version at a variety of on-line booksellers (this should be added to your personal library). A PDF version is available for download on the course Canvas site.

***Set Pieces***, *Architectural Record*, 2023. Access through the course Canvas site.

Other handouts and articles may be assigned and will be made available by the course instructors either in class or through the class canvas site.

## Class Meeting

Thursday Periods 4-6 (10:40 am – 1:40 pm)  
Room TBA

### **Instructors**

**Martin Gold**  
Phone: 352.294.1474  
e-mail: mgold@ufl.edu  
Hours: by appointment

**Stan Kaye**  
Phone: 352.274.0510  
e-mail: stankaye@arts.ufl.edu  
Hours: by appointment

### **Electronic Interface**

Reference information, articles and other important information for the course will be available through the UF Canvas Interface and MIRO.

MIRO – downloading the MIRO app is recommended. Much information and discussion will be managed through the MIRO board at:

Students are required to check in regularly during the week for information and assignment updates.

### **Course Schedule**

Week	Date	Topics	Prep Reading*
1	Jan 09	<b>Course introduction</b> Conceptualizations of Light Project Phase 1: Precedent Research	
2	Jan 16	<b>Vision, Perception &amp; Properties of Light</b> Reading discussion Precedent Discussion	<i>In Praise of Shadows</i> (PDF) <i>Set Pieces</i> (PDF)
3	Jan 23	<b>Field Trip – Theater Department</b> Precedent Discussion	No reading
4	Jan 30	Precedent presentations (preliminary) Powerpoint presentations (preliminary) Reading Discussion	The Eyes of the Skin – Pallasmaa (PDF)
5	Feb 06	<i>Precedent Presentations</i> Powerpoint presentations Assign Project 2	No reading
6	Feb 13	<b>Lighting Design Process</b> Reading Discussion Field Measurements Project Phase 2: Design competition	Gaston Bachelard (PDF) IESNA reading TBA
7	Feb 20	<b>Lighting Modeling Tools</b> Computer Models Project Discussion	IESNA reading TBA
8	Feb 27	<b>Electric Light sources</b> Incandescent, fluorescent, gas discharge & LED Lighting Control Project Discussion	Diane Ackerman Articles – Light, Color (PDF)
9	Mar 05	<b>Daylight</b> Light qualities and architectural responses Project Discussion	Light Revealing Form: Millett Chapter (PDF)
10	Mar 12	<b>Spring Break</b> no class meeting	No reading
11	Mar 19	<i>Project reviews and discussion</i>	No reading
12	Mar 26	<b>Spatial Qualities of Light</b> Light, form and spatial interactions Project review and discussion	No reading
13	April 02	<b>Parametric issues</b> Product Literature Traditional Lighting Calculations Project Review and Discussion	No reading
14	April 09	<i>Project reviews and discussion</i>	No reading
15	April 16	Project presentations** end of course	No reading
16	April 23	no class meeting (reserved for presentations)	

\* Readings must be completed in preparation for the discussion on the date they are listed.

\*\* Attendance at all project presentations is required for full credit in the course

### Course Reference Texts:

The following texts have been requested for reserve in the Architecture and Fine Arts Library, reference texts will sometimes have assigned readings. They are available to provide a resource for presentations; as a supplement to the course texts; and to stimulate and reinforce the discussions in the course.

*Architectural Lighting: Second Edition.* M. David Egan, Victor Olgay, McGraw Hill, New York, 2002. ISBN 0-07-020587-6.

*Architectural Lighting Design.* Gary R. Steffy, Van Nostrand Reinhold company, 1990.

*The Architecture of the Well Tempered Environment, Second Edition.* Reyner Banham, University Of Chicago Press; Second Edition, Revised edition, 1984. ISBN-13: 978-0226036984

*American Building: The Environmental Forces that Shape It., (updated),* James Marston Fitch with William Bobenhausen. Oxford University Press, USA, 1999. ISBN-13: 978-0195110401

*Daylight in Architecture.* Benjamin H. Evans, McGraw-Hill Book company, 1981. ISBN-13: 978-0070197688

*Daylighting for Sustainable Design.* Mary Guzowski McGraw\_Hill, 2000. ISBN-13: 978-0070254398

*Lightbook: The Practice of Lighting Design,* Ulrike Brandi and Christoph Geissmar-Brandi, Birkhäuser, 2001. ISBN-13: 978-3764363031

*Made of Light: The Art of Light and Architecture,* Mark Major, Johnathan Speirs, Anthony Tischhauser, Birkhauser, Basel, 2005. ISBN-13: 978-3764368609

*The Dramatic Imagination* by Robert Edmund Jones, Theatre Arts Books, 1987. ISBN: 0878305920

*The Empty Space,* Peter Brook, Touchstone Books, reprint 1997, ISBN: 0684829576

*In Praise of Shadows,* Junichiro Tanizaki, Leete's Island Books; First Edition, 1977. ISBN-13: 978-0918172020.

### Other recommended texts:

*Design With Innovative Daylighting.* P. J. Littlefair BRE Publications 1996.

*Interior Lighting for Designers.* Gordon & Nuckolls, John Wiley & Sons, 1995.

*Light.* Michael Sobel University of Chicago Press 1987. *Light and Space: Modern Architecture 1.* A. D. A. EDITA, Tokyo Co., Ltd., 1994.

*Light and Space: Modern Architecture 2.* A. D. A. EDITA, Tokyo Co., Ltd., 1994.

*Light: The Shape of Space.* Lou Michel, Van Nostrand Reinhold, 1996

*Lighting: An Introduction to Light, Lighting and light Use.* Janet Turner, B. T. Batsford Ltd. 1994.

*Simplified Design of Building Lighting.* Marc Schiler, John Wiley & Sons, 1992.