Lighting Design Seminar

Environmental Technology Elective Fall 2019
ARC 6670 • 03 Credits

> *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

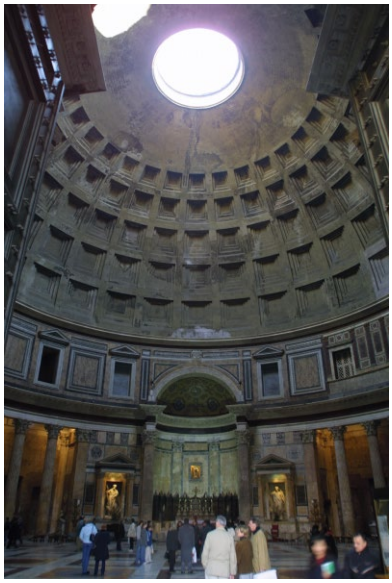
Introduction

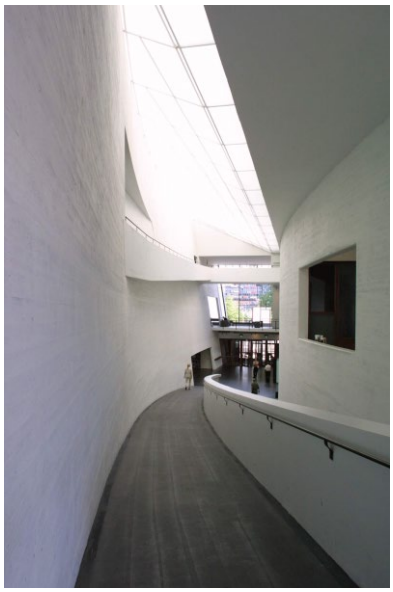
Students will explore the relations among humans and light – cultural interpretations (the poetics of light), historic applications of light, perception of light, physical properties of light (wave phenomenon), interactions of light and surface (materiality), and electricity to light processes. Investigations, coursework, and seminar discussions will focus on relating qualitative and quantitative evaluations (metrics) of illuminated environments as an expression of conceptual intention in 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.

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.

The design project this year will be to develop a lighting design for Turlington Plaza and Exterior Façade. See project description on separate handoiut.





Course Structure

The seminar/studio course will include organized seminars, topical lectures, student presentations, open discussions and design collaboration time 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 through computer and/or physical scale model studies, lighting calculations, architectural drawings, conceptual diagrams, and product specifications. Concept development will be guided by IES lighting guidelines, individual research, site and program analysis, and course critiques. This mode of inquiry, assimilation, and revision will carry the projects from conception through schematic design drawings including 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. Guest lighting experts that work professionally as lighting consultants, designers and educators will be brought in as available. 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.

Guest Designer

TBA

Student Evaluation (grading)

As a seminar, consistent attendance and active topical contributions by students engenders learning. Enthusiastic engagement in this mode of learning 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 (3) will comprise the remainder of performance evaluation.

Participation in discussions	20%
Project 1: Cinematic Deconstruction	30%
Project 2: Design Intervention	50%
Total	**100%**

Required Course Texts:

Lighting Handbook 10th Edition. Editors: David DiLaura, Kevin Houser, Richard Mistrick, Gary Steffy. ISBN # 978-0-87995-241-9. This text is being made available to students in this course at the special price of $200 (regularly $595) by the Illuminating Engineering Society of North America (IESNA). This is a new edition this year and will be current for the next 10 years – this should be included in your personal reference library. Students have the choice of a PDF version or print version (the print version requires an additional $20 shipping charge).

To order, go on-line to one of the following links:

Link for ordering the print version:
https://www.ies.org/handbook/

Link for ordering the PDF version:
https://www.ies.org/handbook/pdf/

When you are ordering, it will ask for a promotional code. At that location enter **ARC6670** for the discount. Please do not share this information with others as the number of texts is limited. The offer will expire September 30, 2018 so please order early.

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 added to your personal library). A PDF version is available for download on the course file share site (see page 5).

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

Class Meeting

Thursday Periods 2-4
Room LEI 182 | Leigh Hall

Instructor

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

Course Schedule

Week	Date	Topics	Prep Reading*
1	Aug 22	**Course introduction** Conceptualizations of Light Introduce Project 1: Cinematic Lighting Analysis (film selections)	
2	Aug 29	**Vision, Perception & Properties of Light** Reading discussion Lab session Film Abstracts	*In Praise of Shadows* (PDF) *Set Pieces* (PDF)
3	Sep 05	**Field Trip – Theater Department**	Diane Ackerman Articles – Light, Color (PDF) IESNA Chapters 1, 2, 3, 4 & 6
4	Sep 12	**Lighting Design Process** Reading Discussion Case Study Updates Field Measurements	Review IESNA Chapters 21 & 24 (relative to the project program)
5	Sep 19	Film Study Reviews & comments Powerpoint presentations (preliminary)	IESNA Chapters 9 &11
6	Sep 26	*Film Study presentations* Powerpoint presentations Assign Project 2	The Eyes of the Skin – Pallasmaa (PDF) IESNA Chapter 10, 21 & 24
7	Oct 03	**Lighting Modeling Tools** Computer Models Physical Models & Reading Discussion	IESNA Chapter 7, 13 &16
8	Oct 10	**Electric Light sources** Incandescent, fluorescent, gas discharge & LED Lighting Control	IESNA Chapter 14 Gaston Bachelard (PDF)
9	Oct 17	**Daylight** Light qualities and architectural responses	Light Revealing Form: Millett Chapter (PDF)
10	Oct 24	*Project reviews and discussion*	IESNA Chapter 8 &12
11	Oct 31	**Spatial Qualities of Light** Light, form and spatial interactions Project review and discussion	Review Readings to date
12	Nov 07	**Parametric issues** Product Literature Traditional Lighting Calculations	IESNA Chapter 10 (review)
13	Nov 14	*Project reviews and discussion*	
14	Nov 21	*Thanksgiving Holiday (no class)*	
15	Nov 28	Project presentations**	
16	Dec 05	no class meeting	

** 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 Edtition. M. David Egan, Victor Olgyay, McGraw Hill, New York, 2002. ISBN 0-07-020587-6.
Architectural Lighting Design. Gary R. Steffy, Vab 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 Environmetnal 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.
Light Revealing Architecture Marietta Millet, Van Nostrand Reinhold, 1996.
Lightbook: The Practice of Lighting Design, Ulrike Brandi and Christoph Geissmar-Brandi, Berkhäuser, 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
Stage Lighting Design by Richard Pilbrow, Design Press, and imprint of Quite Specific Media Group, Ltd. 260 Fifth Avenue. 1997. ISBN-13: 978-0896762350
Sun, Wind & Light: Architectural Design Strategies, 2nd Edition by G. Z. Brown, Mark DeKay, John Wiley & Sons, 2000. ISBN- 0471348775
The Dramatic Imagination by Robert Edmund Jones, Theatre Arts Books, 1987. ISBN: 0878305920
The Empty Space, Peter Brook, Touchstone Books, reprint 1997, ISBN: 0684829576

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.
Mechanical and Electrical Equipment for Buildings (8th Edition) Stein & Reynolds, John Wiley & Sons, 1992.
Simplified Design of Building Lighting. Marc Schiler, John Wiley & Sons, 1992.