Lighting Design Seminar
Environmental Technology Elective  Spring 2014
ARC 6670 & THE 6905 • 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, it's about sensing.

James Turrell

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 as a wave phenomenon, interactions between light and surface, and electrical light systems. Investigations, coursework, and seminar discussions will focus on relating qualitative and quantitative evaluations of lighted environments as an expression of conceptual intentions through 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 and lighting calculations; and the implementation of design ideas as part of an integrated lighting design proposal.

Content

Lecture, seminar and project modes of learning will be employed to assist students in developing conceptual lighting design proposals and to refine schemes to a high degree of specificity.

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 and presented to the class to provide a wide range of design concepts and alternative lighting possibilities.

The design project this year will be to develop a lighting design scheme for the CitLab-Sarasota building in downtown Sarasota. The building was originally designed by noted 'Sarasota School' architect William Rupp in 1963 as a furniture showroom. The building will undergo a substantial renovation to restore the mid-century modern character while accommodating design studios, offices, a gallery, lecture room, and other support functions. Students will submit their projects to the competition at the end of course. The project will provide a framework for computer
modeling, scale modeling and lighting calculations as part of the design process

The proposals will contribute to the concurrent building renovation design that will commence with demolition in February 2014. The renovation will be designed in collaboration the Guy Peterson’s firm Office for Architecture and potentially will include concepts developed in this course.

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 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 and assimilation 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 locally (on UF campus) and to Sarasota, Florida 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 scheme

Project Sequence

Course pedagogy will be engaged through three typological modes of inquiry. Firstly, analytical investigations into the objective and subjective parameters of light including physical, perceptual and quantitative conditions will be discussed – lecture format. The second, a cinematic composition (a noted film) will be deconstructed in an attempt to reveal linkages between archetypal themes, design conceptualizations and the creation of space, time and emotion through light as a constructed reality. Thirdly, we will develop a lighting scheme for an architecture program and civic organization as part of a renovation of a mid-century modern building. The project will explore the conceptualization of design proposals and the subsequent development of a lighting scheme drawn from the conceptual proposal, precedent research, modeling analysis, field measurements, fixture types, architectural conditions, code requirements, and IES design guidelines. The proposals will largely accept the proposed architectural renovation with suggestions for minor changes that enhance the role of light as part of the design.

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

Guest designers Thomas Paterson and Oriana Remaro of the lighting design firm Lux Populi will participate as experts and critics to facilitate student work and offer insights into the issues of conceptual and applied lighting design.
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.

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Participation</td>
<td>20%</td>
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<tr>
<td>Project 1: Cinematic Deconstruction</td>
<td>30%</td>
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<tr>
<td>Project 2: Design Intervention</td>
<td>50%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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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 **11martin2013** for the discount. Please do not share this information with others as the number of texts is limited. The offer will expire January 31, 2014 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 e-learning site.

Other handouts and articles may be assigned and will be made available by the course instructors either in class or through electronic transmittal. See reference texts below.
Class Meeting

Gainesville  Day: Tuesday
            Time: Periods 7-9 (1:50 pm - 4:55 pm)
            Room: Nadine McGuire 219

Orlando  Day: Wednesday
         Time Periods 4-6 (9:35 am – 12:30 pm)
         Room: TBA

Instructors

Martin Gold  Stan Kaye
ARCH 231  207 McGuire Pavilion
Phone: 392-0205 ext 209  Phone: 273-0510
e-mail: mgold@ufl.edu  e-mail: stankaye@ufl.edu
Hours: MWF 9:00 - 10:00 am  Hours: M,Tu 12:00 - 1:00 pm

Electronic Interface
Reference information, articles and other important information
for the course can be found at:
## Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Prep Reading*</th>
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<tbody>
<tr>
<td>1</td>
<td>7/8 Jan</td>
<td><strong>Course introduction</strong>&lt;br&gt;Conceptualizations of Light&lt;br&gt;Introduce Project 1: Cinematic Lighting Analysis (project teams and film selections)</td>
<td><em>In Praise of Shadows</em> (PDF)&lt;br&gt;*Van der Heide (TED Talk)&lt;br&gt;*Set Pieces (PDF)</td>
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<td>2</td>
<td>14/15 Jan</td>
<td><strong>Vision, Perception &amp; Properties of Light</strong>&lt;br&gt;Reading discussion&lt;br&gt;Lab session&lt;br&gt;Film Abstracts</td>
<td>*Diane Ackerman Articles – Light, Color (PDF)&lt;br&gt;IESNA Chapters 1, 2, 3, 4 &amp; 6</td>
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<td>3</td>
<td>21 Jan</td>
<td><strong>Field Trip – Sarasota</strong>&lt;br&gt;Project site visit&lt;br&gt;Turrell Sky Space&lt;br&gt;Sarasota School Architecture</td>
<td>*Gaston Bachelard (PDF)&lt;br&gt;Review IESNA Chapters 21 &amp; 24 (relative to the project program)</td>
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<td>4</td>
<td>28/29 Jan</td>
<td><strong>Lighting Design Process</strong>&lt;br&gt;Reading Discussion&lt;br&gt;Case Study Updates&lt;br&gt;Field Measurements</td>
<td>IESNA Chapters 9 &amp;11</td>
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<td>5</td>
<td>4/5 Feb</td>
<td><em><strong>Case Study presentations</strong></em>&lt;br&gt;Powerpoint presentations</td>
<td>no reading assignment</td>
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<td>6</td>
<td>11/12 Feb</td>
<td><strong>Lighting Design Tools</strong>&lt;br&gt;AGI 32 tutorial session&lt;br&gt;Physical Models &amp; Reading Discussion&lt;br&gt;CityLab-Sarasota Project – new teams</td>
<td>AGI 32 tutorial&lt;br&gt;<a href="http://www.agi32.com/index.php?id=11-LearnAGI32">http://www.agi32.com/index.php?id=11-LearnAGI32</a>&lt;br&gt;IESNA Chapter 10&lt;br&gt;Review Chapters 21 &amp; 24</td>
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<td>7</td>
<td>18/18 Feb</td>
<td><strong>Electric Light sources</strong>&lt;br&gt;Incandescent, fluorescent, gas discharge &amp; LED Lighting Control</td>
<td>IESNA Chapter 7, 13 &amp;16</td>
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<td>8</td>
<td>25/26 Feb</td>
<td><strong>Daylight</strong>&lt;br&gt;Light qualities and architectural responses&lt;br&gt;<em>Theater tour</em></td>
<td>IESNA Chapter 14</td>
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<td>9</td>
<td>4/5 Mar</td>
<td><em><strong>Spring Break – no class</strong></em></td>
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<td>10</td>
<td>11/12 Mar</td>
<td><strong>Spatial Qualities of Light</strong>&lt;br&gt;Light, form and spatial interactions&lt;br&gt;Project review and discussion</td>
<td>Millett Chapter (PDF)&lt;br&gt;IESNA Chapter 8 &amp;12</td>
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<tr>
<td>11</td>
<td>18/19 Mar</td>
<td><strong>Project reviews and discussion</strong></td>
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<tr>
<td>12</td>
<td>25/26 Mar</td>
<td><strong>Parametric issues</strong>&lt;br&gt;Product Literature&lt;br&gt;Traditional Lighting Calculations</td>
<td>IESNA Chapter 10 (review)</td>
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<tr>
<td>13</td>
<td>1/2 Apr</td>
<td><strong>Project reviews and discussion</strong></td>
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<tr>
<td>14</td>
<td>8/9 Apr</td>
<td>Project presentations**</td>
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<tr>
<td>15</td>
<td>15/16 Apr</td>
<td>Project presentations**</td>
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<td>16</td>
<td>22/23 Apr</td>
<td>Design Juries - no class meeting</td>
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<td></td>
<td>28 Apr</td>
<td>Final submission due by 5 pm.</td>
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* *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.


Other recommended texts:

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