A comprehensive overview of the luminous and sonic environment with consideration to energy-conscious design. Content includes human physiological and psychological influences of light in the built environment, natural and electric light sources, daylighting design techniques, lighting measurements and controls, light and form, computations for quantity and quality of light, and the use of illuminated models for daylighting and electric lighting design, the basic principles of acoustics impacting room acoustics, mechanical system noise, sound absorption and isolation, and the basic principles of electrical systems. For Architectural Studies majors: Co-requisite: ARC452 and Prerequisites: PHYS 203B, 253B and restricted to major. For Interior Design majors: ID391, Mathematics 111, PHYS 203a, 253a and restricted to majors. For Master of Architecture majors: restricted to major.

II. COURSE OBJECTIVES:

A. Develop an awareness of the historical basis for natural and electric lighting.
B. Develop an awareness of the psychological impact of light in the built environment.
C. Develop an awareness of vision and perception.
D. Develop in-depth knowledge of daylighting design techniques.
E. Develop in-depth knowledge of light sources.
F. Develop in-depth knowledge of light measurement.
G. Perform lighting calculations.
H. Gain knowledge in the manipulation of light and form
I. Gain an understanding of electrical principles, power distribution, and the National Electric Code.
J. Develop a comprehensive lighting design plan.
K. Become acquainted with the use of computer-aided lighting design through the application of photometric software.
L. Develop an understanding of basic acoustical phenomena, formulas, and calculations for controlling sound.

III. Topical Outline:                         Percentages of Time (Estimated)

A. Historical Basis of Natural and Electrical Lighting  1%
B. Psychological Impact of Light                      3%
C. Vision and Perception                             3%
D. Daylighting and Design                            15%
E. Light Sources                                     15%
F. Light and Form                                    3%
G. Light Measurement and Lighting Calculations       10%
<table>
<thead>
<tr>
<th></th>
<th>The Energy Code and Sustainability Issues</th>
<th>5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Electrical Principles</td>
<td>10%</td>
</tr>
<tr>
<td>J.</td>
<td>Lighting Design</td>
<td>15%</td>
</tr>
<tr>
<td>K.</td>
<td>The Sonic Environment</td>
<td>20%</td>
</tr>
</tbody>
</table>

### IV. METHODOLOGY

**A. Lecture and handout material, video material, linked internet content, tapes, manufacturers catalogs, required field trips, and reserved readings in the SoA Library, Dropbox, and D2L**

**B. Required Tools**

3-ring binder for class notes/handouts/assignments/specifications – by the end of the semester, this will be a complete and organized course binder.

Calculator with trigonometric and logarithmic functions

**C. Required Text**


**Software**

Integrated Environmental Solutions software, IES-VE. May be purchased (recommended) or used in the School of Architecture Computer Lab on a limited number of computers.

**D. Recommended References**


Louis I. Kahn: Light and Space; Buttiker, Urs; Whitney Library of Design; ISBN 8230-27773-2; 1994


LEED Study Guide


**E. Guests speakers, workshops, and field trips may be incorporated as appropriate**
V. CRITERIA OF EVALUATION

Evaluation is based on class assignments, projects and exams according to the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Grading Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project 1</td>
<td>15%</td>
<td>100-90 A</td>
</tr>
<tr>
<td>Project 2</td>
<td>35%</td>
<td>89-80 B</td>
</tr>
<tr>
<td>Homework</td>
<td>20%</td>
<td>79-70 C</td>
</tr>
<tr>
<td>Mid-Term Exam</td>
<td>15%</td>
<td>69-60 D</td>
</tr>
<tr>
<td>Final Exam</td>
<td>15%</td>
<td>59-00 F</td>
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<tr>
<td></td>
<td>100%</td>
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</tbody>
</table>

To be registered for this class, you must satisfy the prerequisites for the class. If this is not the case or you are uncertain, you must see the instructor or advisor immediately. The program reserves the right to retain any and all student work submitted for inclusion in program files. Students may make arrangements with the faculty member to check out retained work for reproduction purposes. While facilities are provided for use, costs for materials and supplies, individual equipment, and required field trips and workshops necessary to the successful completion of the program are borne by the student. A reasonable estimate of additional expenses is in the range of $1000 to $2000 per academic year. Students are encouraged to read Section 7 of the University Bulletin regarding University policies and the Student Conduct Code which includes Acts of Academic Dishonesty e.g., plagiarism – representing the work of another as one’s own work; preparing work for another that is to be used as that person’s own work; and Acts of Social Misconduct and violations of other university policies e.g., alcohol use, smoking, etc. “A student has the responsibility to be fully acquainted and comply with the published Student Conduct Code in its entirety and to comply with the policies of the Code as well as all federal, state, and local laws, and all university policies and procedures.”


Special Concerns: If there is any issue you might have that could impact your performance in the class, please inform the instructor the first week of class. NOTE: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the appropriate campus department involved with services for students with disabilities.
Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT’s website at www.bert.siu.edu, Department of Safety’s website www.dps.siu.edu (disaster drop down) and in Emergency Response Guideline pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.

Procedures: If an evacuation of Quigley Hall is required during an emergency, ALL School of Architecture students, faculty, and staff (from all three programs) are to gather ASAP after exiting in the grassed area east of the Quigley Courtyard and covered walkway area to determine if there are people unaccounted for at that particular time. There are four SoA faculty members that are part of the SIUC Quigley Hall BERT Team (Brazley, Frisch, Kidd, White, and Wojnarowski) who will be facilitating the necessary emergency procedures. There are BERT Posters located in numerous public areas throughout Quigley with Quigley Team emergency phone numbers.

Do not hesitate to call 911 if you have any sense of emergency and there isn’t a faculty or staff person available to immediately assist – 911 Staff are highly qualified and prepared professionals to make a response decision and to give you advice over the phone.

QUIGLEY HALL EMERGENCY RESPONSE MEETING AREAS

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>AREA</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food and Nutrition</td>
<td>1</td>
<td>Woody Hall grassed area West of Quigley Main Entry</td>
</tr>
<tr>
<td>Child Development Laboratory</td>
<td>2</td>
<td>North Side Quigley beyond Fenced Area</td>
</tr>
<tr>
<td>Social Work</td>
<td>3</td>
<td>Grassed Area NE of Loading Dock and Auditorium</td>
</tr>
<tr>
<td>School of Architecture</td>
<td>4</td>
<td>Grassed Area East of Quigley Patio and the Covered Walkway</td>
</tr>
<tr>
<td>College of Education - Pre-School</td>
<td>5</td>
<td>Grassed Walkways Area beyond South Entry</td>
</tr>
<tr>
<td>General Classrooms &amp; Auditorium</td>
<td>1, 3, &amp; 4</td>
<td>Please instruct those outside faculty, students, and visitors during an emergency</td>
</tr>
</tbody>
</table>
The accredited degree program must demonstrate that each graduate possesses the knowledge and skills defined by the criteria set out below. The knowledge and skills are the minimum for meeting the demands of an internship leading to registration for practice. The school must provide evidence that its graduates have satisfied each criterion through required coursework. If credits are granted for courses taken at other institutions or online, evidence must be provided that the courses are comparable to those offered in the accredited degree program.

The criteria encompass two levels of accomplishment:

- **Understanding** - The capacity to classify, compare, summarize, explain and/or interpret information.
- **Ability** - Proficiency in using specific information to accomplish a task, correctly selecting the appropriate information, and accurately applying it to the solution of a specific problem, while also distinguishing the effects of its implementation.

The NAAB establishes performance criteria to help accredited degree programs prepare students for the profession while encouraging educational practices suited to the individual degree program. In addition to assessing whether student performance meets the professional criteria, the visiting team will assess performance in relation to the school's stated curricular goals and content. While the NAAB stipulates the student performance criteria that must be met, it specifies neither the educational format nor the form of student work that may serve as evidence of having met these criteria. Programs are encouraged to develop unique learning and teaching strategies, methods, and materials to satisfy these criteria. The NAAB encourages innovative methods for satisfying the criteria, provided the school has a formal evaluation process for assessing student achievement of these criteria and documenting the results. For the purpose of accreditation, graduating students must demonstrate understanding or ability as defined below in the Student Performance Criteria (SPC) assigned to this course.

This course demonstrates student performance that meets the following NAAB accreditation criteria either in whole or in part:

A.4. Technical Documentation: **Ability** to make technically clear drawings, write outline specifications, and prepare models illustrating and identifying the assembly of materials, systems and components appropriate for a building design.

A.11. Applied Research: **Understanding** the role of applied research in determining function, form and systems and their impact on human conditions and behavior.

B.2. Accessibility: **Ability** to design sites, facilities, and systems to provide independent and integrated use by individual switch physical (including mobility), sensory, and cognitive disabilities.

B.3. Sustainability: **Ability** to design projects that optimize, conserve, or reuse natural and built resources, provide healthful Environments of occupants/users, and reduce the environmental impacts of building construction and operations on Future generations through means such as carbon-neutral design, bioclimatic design, and energy efficiency

B.5. Life safety: **Ability** to apply the basic principles of life-safety systems with an emphasis on egress.

B.8. Environmental Systems: **Understanding** the principles of environmental systems’ design such as embodied energy, active and passive heating and cooling, indoor air quality, solar orientation, daylighting and artificial illumination, and acoustics; including the use of appropriate performance assessment tools.

B.10. Building Envelope Systems: **Understanding** of the basic principles involved in the appropriate application of building envelope systems and associated assemblies relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.

B.11. Building Service Systems: **Understanding** of the basic principles and appropriate application and performance of building service systems such as plumbing, electrical, vertical transportation, security, and fire protection systems.

C.2. Human Behavior: **Understanding** of the relationship between human behavior, the natural environment and the design of the built environment.
There are thirteen standards that apply to Student Learning Expectations. In order to be accredited, an interior design program must comply or partially comply with all these standards as well as three additional standards relating to program mission, goals, curriculum, and administration.

Student learning expectations are identified by three levels of learning:

- **Awareness** – familiarity with specified data and information that is demonstrated in student work.
- **Understand/Understanding** – a thorough comprehension of concepts and their interrelationships.
- **Apply/Ability/Able** – competent entry-level skills that must be demonstrated in completed student work.

Student work is broadly defined to include all tangible work produced by students such as projects, research papers, completed exams, class exercises, recorded presentations, etc.

**This course demonstrates student performance that meets the following CIDA accreditation criteria either in whole or in part:**

2. **Global Perspective for design.** Entry-level interior designers have a global view and weight design decisions within the parameters of ecological, socio-economic, and cultural contexts.

2. a. Student work demonstrates understanding of the concepts, principles, and theories of sustainability as they pertain to building methods, materials, systems, and occupants.

2. b. Students understand the implications of conducting the practice of design within a world context.

4. **Design Process.** Entry-level interior designers need to apply all aspects of the design process to creative problem solving. Design process enables designers to identify and explore complex problems and generate creative solutions that support human behavior within the interior environment.

4. b. Students are able to gather, evaluate, and apply appropriate and necessary information and research findings to solve the problem (pre-design investigation).

6. **Communication.** Entry-level interior designers are effective communicators.

6. e. Students are able to produce competent contract documents including coordinated drawings, schedules, and specifications appropriate to project size and scope and sufficiently extensive to show how design solutions and interior construction are related.

10. **Color.** Entry-level interior designers apply color principles and theories.

10. a. Student work demonstrates understanding of color principles, theories, and systems.

10. b. Student work demonstrates understanding of the interaction of color with materials, texture, light, form and the impact on interior environments.

12. **Environmental Systems and Controls.** Entry-level interior designers use the principles of lighting, acoustics, thermal comfort, and indoor air quality to enhance the health, safety, welfare, and performance of building occupants.

12. a. Students understand the principles of natural and electrical lighting design.

12. b. Students competently select and apply luminaires and light sources.

12. c. Students understand the principles of acoustical design.

12. d. Students understand appropriate strategies for acoustical control.
13. Interior Construction and Building Systems. Entry-level interior designers have knowledge of interior construction and building systems.

13. d. Student work demonstrates understanding that design solutions affect and are impacted by energy, security, and building controls systems.

14. Regulations. Entry-level interior designers use laws, codes, standards, and guidelines that impact the design of interior spaces.

14. a. Students have awareness of sustainability guidelines.

14. b. Students have awareness of industry-specific regulations.

14. g. Students apply appropriate federal, state/provincial, and local codes.

14. h. Students apply appropriate standards.

14. i. Students apply appropriate accessibility guidelines.
IMPORTANT DATES *
Semester Class Begins: .................................................................01/19/2016
Last day to add a class (without instructor permission):..............01/24/2016
Last day to withdraw completely and receive a 100% refund: ......01/31/2016
Last day to drop a course using SalukiNet:.................................04/03/2016
Last day to file diploma application (for name to appear in Commencement program): .................................................................02/12/2016
Final examinations: ......................................................................05/09–05/13/2016

Note: For outreach, internet, and short course drop/add dates, visit Registrar’s Academic web page: http://registrar.siu.edu/

SPRING SEMESTER HOLIDAYS
Martin Luther King, Jr.’s Birthday Holiday 01/18/2016
Spring Break 03/12—03/20/2016

WITHDRAWAL POLICY – Undergraduate only
Students who officially register for a session may not withdraw merely by the stopping of attendance. An official withdrawal form needs to be initiated by the student and processed by the University. For the proper procedures to follow when dropping courses and when withdrawing from the University, please visit http://registrar.siu.edu/catalog/undergraduatecatalog.html

INCOMPLETE POLICY – Undergraduate only
An INC is assigned when, for reasons beyond their control, students engaged in passing work are unable to complete all class assignments. An INC must be changed to a completed grade within one semester following the term in which the course was taken, or graduation, whichever occurs first. Should the student fail to complete the course within the time period designated, that is, no later than the end of the semester following the term in which the course was taken, or graduation, whichever occurs first, the incomplete will be converted to a grade of F and the grade will be computed in the student’s grade point average. For more information please visit: http://registrar.siu.edu/grades/incomplete.html

REPEAT POLICY
An undergraduate student may, for the purpose of raising a grade, enroll in a course for credit no more than two times (two total enrollments) unless otherwise noted in the course description. For students receiving a letter grade of A, B, C, D or F, the course repetition must occur at Southern Illinois University Carbondale. Only the most recent (last) grade will be calculated in the overall GPA and count toward hours earned. See full policy at http://registrar.siu.edu/catalog/undergraduatecatalog.html

GRADUATE POLICIES
Graduate policies often vary from Undergraduate policies. To view the applicable policies for graduate students, please visit: http://gradschool.siu.edu/about-us/grad-catalog/index.html

DISABILITY POLICY
Disability Support Services provides the required academic and programmatic support services to students with permanent and temporary disabilities. DSS provides centralized coordination and referral services. To utilize DSS services, students must come to the DSS to open cases. The process involves interviews, reviews of student-supplied documentation, and completion of Disability Accommodation Agreements. http://disabilityservices.siu.edu/

PLAGIARISM
Student Conduct Code: http://sr.siu.edu/student_conduct_code/

MORRIS LIBRARY HOURS
http://www.lib.siu.edu/about

SAFETY AWARENESS FACTS AND EDUCATION
Title IX makes it clear that violence and harassment based on sex and gender is a Civil Rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you can find the appropriate resources here: http://safe.siu.edu

SALUKI CARES
The purpose of Saluki Cares is to develop, facilitate and coordinate a university-wide program of care and support for students in any type of distress—physical, emotional, financial, or personal. By working closely with faculty, staff, students and their families, SIU will continue to develop a culture of care and demonstrate to our students and their families that they are an important part of the community. For Information on Saluki Cares: (618) 453-5714, or siucares@siu.edu, http://salukicares.siu.edu/index.html

EMERGENCY PROCEDURES
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INCLUSIVE EXCELLENCE
SIU contains people from all walks of life, from many different cultures and subcultures, and representing all strata of society, nationalities, ethnicities, lifestyles, and affiliations. Learning from and working with people who differ is an important part of education as well as an essential preparation for any career. For more information please visit: http://www.inclusivesuccess.siu.edu/

LEARNING AND SUPPORT SERVICES
Help is within reach. Learning Support Services offers free tutoring on campus and math labs. To find more information please visit the Center for Learning and Support Services website:

Tutoring: http://tutoring.siu.edu/
Math Labs: http://math.siu.edu/courses/course-help.php

WRITING CENTER
The Writing Center offers free tutoring services to all SIU students and faculty. To find a Center or Schedule an appointment please visit http://write.siu.edu/

AFFIRMATIVE ACTION & EQUAL OPPORTUNITY
Our office’s main focus is to ensure that the university complies with federal and state equity policies and handles reporting and investigating of discrimination cases. For more information visit: http://diversity.siu.edu/

Additional Resources Available:

- SALUKINET: https://salukinet.siu.edu/cp/home/displaylogin
- ADVISEMENT: http://advisement.siu.edu/
- PROVOST & VICE CHANCELLOR: http://pveaa.siu.edu/
- SIU ONLINE: http://online.siu.edu/
## INSTRUCTIONAL SCHEDULE and PROJECT DUE DATES

<table>
<thead>
<tr>
<th>WEEK</th>
<th>DATES</th>
<th>Projects, Readings from Mechanical &amp; Electrical Equipment for Buildings, &amp; Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wk 1</td>
<td>1/19</td>
<td>Introduction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2 Energy, 3.6 Direct Sun &amp; Daylight, 3.7 Sound &amp; Airflow (a) Noise –</td>
</tr>
<tr>
<td>Wk 2</td>
<td>1/26</td>
<td>Chapter 6</td>
</tr>
<tr>
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<td>28</td>
<td>Homework 1 – Solar Geometry &amp; Shading Devices</td>
</tr>
<tr>
<td>Wk 3</td>
<td>2/02</td>
<td>Passive Environmental Systems – Chapter 8 Daylighting</td>
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<td></td>
<td>04</td>
<td>Homework 2 – Daylight factor</td>
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<tr>
<td>Wk 4</td>
<td>2/09</td>
<td>Chapter 13 – Lighting Fundamentals</td>
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<tr>
<td></td>
<td>11</td>
<td>Project 1 assigned – Quality of Light</td>
</tr>
<tr>
<td>Wk 5</td>
<td>2/16</td>
<td>Chapter 14 - Electric Light Sources</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Chapter 15 - Lighting Design Process</td>
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<tr>
<td>Wk 6</td>
<td>2/23</td>
<td>Chapter 16 - Electric Lighting Design</td>
</tr>
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<td>25</td>
<td>Chapter 17 – Electric Lighting Applications</td>
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<tr>
<td>Wk 7</td>
<td>3/01</td>
<td>Project 1 due</td>
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<td>03</td>
<td>Review for Midterm</td>
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<tr>
<td>Wk 8</td>
<td>3/08</td>
<td>MIDTERM</td>
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<tr>
<td></td>
<td>10</td>
<td>Project 1 Critique and comments</td>
</tr>
<tr>
<td>Wk 9</td>
<td>3/15 &amp; 17</td>
<td>NO CLASS (Spring Break)</td>
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<tr>
<td>Wk 10</td>
<td>3/22</td>
<td>Chapter 22 - Fundamentals of Architectural Acoustics</td>
</tr>
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<td>24</td>
<td>Chapter 23 - Sound in Enclosed Spaces</td>
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<tr>
<td>Wk 11</td>
<td>3/29</td>
<td>Chapter 24 – Building Noise Control</td>
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<tr>
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<td>31</td>
<td>Homework 3 – Objectives &amp; Criteria</td>
</tr>
<tr>
<td>Wk 12</td>
<td>4/05</td>
<td>Chapter 27 – Electrical Systems &amp; Materials</td>
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<td>07</td>
<td>Homework 4 – Service and Utilization</td>
</tr>
<tr>
<td>Wk 13</td>
<td>4/12</td>
<td>Chapter 28 – Wiring &amp; Raceway</td>
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<td>14</td>
<td>Project 2 Assigned – Studio generated building w/ Lighting &amp; Acoustics</td>
</tr>
<tr>
<td>Wk 14</td>
<td>4/19</td>
<td>Revisit Lighting Design Process – Daylighting &amp; Electric Lighting focus</td>
</tr>
<tr>
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<td>21</td>
<td>Electrical/Lighting Plan Considerations</td>
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<tr>
<td>Wk 15</td>
<td>4/26</td>
<td>Mock for Project 2 w/ comments</td>
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<td>28</td>
<td>Lecture reflecting assessment of needs relating to project 2 completion</td>
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<td>Wk 16</td>
<td>5/03</td>
<td>Final Project Due</td>
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<td>Final Exam Review</td>
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<tr>
<td>Wk 17</td>
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