

Environmental **DESIGN**

architecture + landscape architecture + planning

Architectural lighting design

EVDA 617Q (1.5-0)

Instructor: Dr. C. Hachem-Vermette

Winter 2019

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PF 3170, office hours by appointment

Introduction

Lighting design can significantly affect the architectural perception of a space. Understanding the principles of architectural lighting is a basic step towards achieving comfortable, healthy, and environmentally responsible designs. In this course, lighting design will be addressed as part of the broader process of designing the visual experience in architecture. Both daylighting and electric lighting will be covered.

Course outcomes

By the end of this course, students will be able to:

1. To apply simple principles of lighting design process including the use of the 5 layers approach.
2. To develop illumination schemes that enhance an architectural design.
3. To demonstrate knowledge of electric illumination systems and design techniques.
4. To demonstrate knowledge of daylighting and its design principles.
5. To analyze designs quantitatively.
6. To demonstrate awareness of sustainable lighting design.

Teaching Approach

The course will be presented in lecture and workshop mode. The workshops will include lighting exercises, and will cover development of lighting designs using lighting maps and redline layouts. The project is a lighting design exercise.

Content: Topic Areas & Detailed Class Schedule

The functions and characteristics of lighting systems will be reviewed, together with their place in the development of design concepts. Components and terminology will be discussed, as well as quantitative design methods. Factors in systems selection will be examined, including:

1. Visual perceptions and the illumination of interiors,
2. Terminology and measurement units in illumination,
3. Electric light sources,
4. Daylighting,
5. Basic calculations for lighting
6. Basic modeling of lighting system (Using AGI32)

Detailed Class Schedule (tentative)

Day1 9:00 am- 1:00pm	Jan 2 nd	9-12: Introduction to Lighting Design; Physical characteristics of light; Lighting metrics. Design process: 5 layers approach (start) 12-1pm -Lighting perception -Project: Introduction, Exercises- on project **
Day2 9:00 am- 1:00pm	Jan 3 rd	Quiz1 (10 mins) 9-10: layers approach (ctd); Task Illuminance; 10- 11: Lamps and lighting Equipment; 11-12 pm: lighting calculations; Exercise of lighting calculations (cavity method) 12-1pm: Lighting map process, Work on project (Part A: application of 5 layers approach, general illuminance calculation, etc.) **
Day3 9:00 am- 1:00pm	Jan 4 th	Quiz 2 (10 mins) 9-10:30: Lighting specs and cutsheets, Lighting control and sustainability , lighting plans 10: 30 -1pm: Project tutorial: calculation (general illumination and other layers of light, extrapolation of info from cutsheets, lighting plans **
Day 4 9:00 am- 1:00pm	Jan 8 th	Quiz 3 9-11:Daylighting (Introduction, Daylighting surfaces, Daylighting design); Shading devices 11-1pm: Tutorial (in class/computer lab TBD) using AGI32 **
Day 5 9:00 am- 1:00pm	Jan 9 th	Quiz 4 9-1:00: GI32 tutorial + assistance in class **
	Jan 14 th	Submission of Project

**Students can continue after official class time

Assessment

Means of Evaluation

Evaluation will be based on:

Lighting Design Project 70%
 Project part A This part of the project deals with the conceptual design of architectural lighting, and will rely on knowledge gained in Day 1&2 (outcomes 1-3)
 Project part B: This part deals with the analytical aspect of a lighting project, including calculation, developing of final lighting maps, selecting lighting equipment, etc. It covers all material learned in the course (Outcomes 1-6).

Quizzes 20%
 Participation 10%
 Total 100%

Grading Scale

Grade	Grade Point Value	4-Point Range	Percent	Description
A+	4.00	4.00	95-100	Outstanding - evaluated by instructor
A	4.00	3.85-4.00	90-94.99	Excellent - superior performance showing comprehensive understanding of the subject matter
A-	3.70	3.50-3.84	85-89.99	Very good performance
B+	3.30	3.15-3.49	80-84.99	Good performance
B	3.00	2.85-3.14	75-79.99	Satisfactory performance
B-	2.70	2.50-2.84	70-74.99	Minimum pass for students in the Faculty of Graduate Studies
C+	2.30	2.15-2.49	65-69.99	All final grades below B- are indicative of failure at the graduate level and cannot be counted toward Faculty of Graduate Studies course requirements.
C	2.00	1.85-2.14	60-64.99	
C-	1.70	1.50-1.84	55-59.99	
D+	1.30	1.15-1.49	50-54.99	
D	1.00	0.50-1.14	45-49.99	
F	0.00	0-0.49	0-44.99	

Notes:

- A student who receives a "C+" or lower in any one course will be required to withdraw regardless of their grade point average (GPA) unless the program recommends otherwise. If the program permits the student to retake a failed course, the second grade will replace the initial grade in the calculation of the GPA, and both grades will appear on the transcript.

Readings

Recommended readings include:

- Kazimee Bashir, Sustainable Urban Forms : Theory, Design and Application, First edition, Cognella Academic Publishing, 2018.
- Barton, H., Grant, M., Guise, R. , Shaping Neighbourhoods: For Local Health and Global Sustainability, Routledge; 2 edition, 2010.
- Alison Cotgrave; Mike Riley Total Sustainability in the Built Environment, Palgrave Macmillan, 2012.
- Lynch, Kevin; Hack, Gary (1962). Site Planning. MIT Press. (2nd ed. 1971; 3rd ed. 1984)

In addition, list of readings related to selected topics will be posted regularly on D2L.

Important Notes

1. Written work, term assignments and other course related work may only be submitted by e-mail if prior permission to do so has been obtained from the course instructor. Submissions must come from an official University of Calgary (ucalgary) email account.
2. Academic Accommodations. Students who require an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to their Instructor or the designated contact person in EVDS, Jennifer Taillefer (jtaillef@ucalgary.ca). Students who require an accommodation unrelated to their coursework or the requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Vice-Provost (Student Experience). For

additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/

3. Plagiarism - Plagiarism involves submitting or presenting work in a course as if it were the student's own work done expressly for that particular course when, in fact, it is not. Most commonly plagiarism exists when:(a) the work submitted or presented was done, in whole or in part, by an individual other than the one submitting or presenting the work (this includes having another impersonate the student or otherwise substituting the work of another for one's own in an examination or test),(b) parts of the work are taken from another source without reference to the original author,(c) the whole work (e.g., an essay) is copied from another source, and/or,(d) a student submits or presents work in one course which has also been submitted in another course(although it may be completely original with that student) without the knowledge of or prior agreement of the instructor involved. While it is recognized that scholarly work often involves reference to the ideas, data and conclusions of other scholars, intellectual honesty requires that such references be explicitly and clearly noted. Plagiarism is an extremely serious academic offence. It is recognized that clause (d) does not prevent a graduate student incorporating work previously done by him or her in a thesis. Any suspicion of plagiarism will be reported to the Dean, and dealt with as per the regulations in the University of Calgary Graduate Calendar.
4. Appeals: If a student has a concern about the course, academic matter, or a grade that they have been assigned, they must first communicate this concern with the instructor. If the concern cannot be resolved with the instructor, the student can proceed with an academic appeal, which normally begins with the Faculty: <http://www.ucalgary.ca/provost/students/ombuds/appeals>
5. Information regarding the Freedom of Information and Protection of Privacy Act (<https://www.ucalgary.ca/legalservices/foip>)
6. Emergency Evacuation/Assembly Points (<http://www.ucalgary.ca/emergencyplan/assemblypoints>)
7. Safewalk information (<http://www.ucalgary.ca/security/safewalk>)
8. Contact Info for: Student Union (<https://www.su.ucalgary.ca/contact/>); Graduate Student representative(<https://gsa.ucalgary.ca/about-the-gsa/gsa-executive-board/>) Student Union Wellness Centre: <https://www.ucalgary.ca/wellnesscentre/>; Library Resources: <http://library.ucalgary.ca/> and Student Ombudsman's Office (<http://www.ucalgary.ca/ombuds>)

CACB Student Performance Criteria:

The following CACB Student Performance Criteria will be covered in this course at a primary level (other criteria will be covered at a secondary level): A1. Critical Thinking Skills; A6. Human Behaviour, B3. Site Design, and B4. Sustainable Design. (*see CACB SPC matrix for further details*)

Contact & Office Information

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Please contact instructor and teaching assistants with any questions or concerns. Meetings by appointment.