



Architectural Lighting Design

EVDA 617Q (3.0-0)

Instructor: Dr. C. Hachem-Vermette

Winter 2020

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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 10:00 am- 1:00pm	Jan 6 th	Introduction to Lighting Design; Lighting perception Introducing Project ; Physical characteristics of light; Lighting metrics.
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Day2 10:00 am- 1:00pm	Jan 7 th	Quiz1 (10 mins) 5 layers approach (ctd); Task Illuminance; Lamps and lighting Equipment lighting calculations; [1hour] Exercise of lighting calculations (cavity method, point by point method)
Day3 10:00 am- 1:00pm	Jan 8 th	Quiz 2 (10 mins) Lighting map process, Lighting specs and cutsheets , Lighting control and sustainability (Alison) Project tutorial: calculation + lighting maps- Introduction to Daylighting (Definition and benefits)
Day 4 10:00 am- 1:00pm	Jan 9 th	Quiz 3 Daylighting (Daylighting surfaces, Daylighting design); Shading devices Tutorial (in class/computer lab) using AGI32 –(last 2 hours)
Day 5 10:00 am- 1:00pm	Jan 10 th	Quiz 4 GI32 tutorial + assistance in class
	Jan 20 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- 25%: 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 - 45%: 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.

University of Calgary Policies and Supports

ACADEMIC ACCOMMODATION

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/. Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at <http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf>.

ACADEMIC MISCONDUCT

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, (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. Any suspicion of plagiarism will be reported to the Dean, and dealt with as per the regulations in the University of Calgary Graduate Calendar.

For information on academic misconduct and its consequences, please see the University of Calgary Calendar at <http://www.ucalgary.ca/pubs/calendar/current/k.html>

COPYRIGHT LEGISLATION:

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf) and requirements of the copyright act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorised sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary.

UNIVERSITY STUDENT APPEALS OFFICE: 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.

<https://ucalgary.ca/student-appeals/>

More student support and resources (e.g. safety and wellness) can be found here:

<https://www.ucalgary.ca/registrar/registration/course-outlines>

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.

Contact & Office Information

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