

Course Outline

Architectural and Engineering Technology
Faculty of Science

“Located on the Tk'emlups te Secwepemc Territory within the
unceded traditional lands of
Secwepmecu'ecw (Secwepemc Nation)”

ARET 1510-3
Building Lighting Design (3,0,0)
Winter, 2020

Instructor: Wagner Cardozo, M.Acct., B.Math., Dipl. Bldg. Tech. (TRU), A.Sc.T.
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Office Hours: By Appointment

Calendar Description

Building lighting design, incorporates a detailed study of the Illuminating Engineering Society of North America (IES) engineering design calculation methods. In addition, the concepts of quantity and quality of illumination will be discussed.

On completion of this course the successful student will be able to determine the illumination requirements of a building through the utilization of the IES calculation methods and apply those requirements; utilizing good engineering practice, to the development of a commercial building lighting design and the creation of lighting layout sketches through classroom assignments.

Course Description

The course introduces the student to the factors considered in the selection of light sources and equipment through the utilization of the Illuminating Engineering Society of North America calculation methods and engineering practices. In addition, the student will complete a detailed study of the principles of the operation and functions of typical lighting systems used in commercial buildings.

During this course the student will be involved in the development of commercial building lighting systems design and lighting system layout sketches.

Educational Objectives/Outcomes

On completion of this course the successful student will be able to determine the illumination requirements of a building through the utilization of the “Illuminating Engineering Society Of North America” calculation methods and apply those requirements; utilizing good engineering practice, to the development of a commercial building lighting design and the creation of lighting layout design drawings through classroom assignments and the use of Auto Cad software.

Prerequisites

Successful completion of ARET 1500 Building Electrical Design.
Or written consent of the Chairperson.

Texts/Materials

Required:

Mechanical and Electrical Systems in Buildings, Sixth Edition,

Authors: Richard R. Janis and William K.Y. Tao, Pearson, ISBN-13: 978-0-13-470118-9

Student Evaluation

Midterm exam	30%
Final exam	40%
Individual Assignments	15%
Term Project Assignments	15%
	100%

Assignment Submission

Late assignments will not be accepted without a valid medical excuse.

Attendance

Attendance will comply with TRU Policy ED 3-1 (May 25, 2015), Student Attendance. Refer to the policy at <http://www.tru.ca/calendar/current/index.htm>.

In addition to and as per Section 2, Article 3, of Policy ED 3-1; if a student misses more than 4 of the lecture and/or seminar and/or lab classes of a course without a valid medical excuse, a recommendation from the course instructor to the Chairperson or Dean will be made and course withdraw procedures will commence.

Letter Grades

Letter Grades assigned will conform to TRU Policy ED (24) 3-5, Grading System for Academic/Career/Developmental Programs. Refer to the policy at <http://www.tru.ca/calendar/current/index.htm>.

Course Topics

1. Light and Lighting
 - a) Light and Vision
 - b) Colour
 - c) Physics of Light
 - d) Light Controls

2. Lighting Equipment and Systems
 - a) Electrical Light Sources
 - b) Factors to Consider in Selecting Light Sources
 - c) Incandescent Light Sources
 - d) Fluorescent Light Sources

2. Lighting Equipment and Systems (continued)
 - e) High-Intensity-Discharge Light Sources
 - f) Miscellaneous Light Sources
 - g) General Comparison of Light Sources
 - h) Luminaires
 - i) Luminaires: Photometry
 - j) General Comparison of Lighting Systems

3. Calculations of Illumination
 - a) Quantity and Quality of Illumination
 - b) Determination of Illumination Requirements
 - c) Comprehensive Method for Determining Quantity and Quality of Illumination
 - d) Lumens (Zonal Cavity) Method
 - e) Point Method

4. Lighting Design
 - a) Design Process
 - b) Design Considerations

Special Course Activities

If course time permits, the arrangement of field trips to a lighting supplier and a construction site will be made.

Methods for Prior Learning Assessment and Recognition

Students applying for credit on the basis of prior learning assessment and recognition must consult with the department chairperson. In general, students who have taken a similar course that covers at least 80 percent of the course material within the last five (5) years will receive advanced credit. Students who are seeking credit on the basis of life experience will be expected to demonstrate their comprehension of the course material to the satisfaction of the department chairperson.

Use of Technology

Classroom lectures will incorporate the use of the white board for lecture notes and power point presentations. The use of drafting software, MS Office, and Excel will be used by the student for the production and completion of course assignments.