Instructor: Burak Gunay, PhD, PEng
Virtual meeting room: [Zoom link]
Office Hour: Email to make an appointment for a one-on-one meeting. I will keep the following timeslots available: Wednesdays 5 pm to 6 pm and Thursdays 5 pm to 6 pm.
Email: burak.gunay@carleton.ca

The class will meet on Thursdays at 6:05 pm via Zoom. Lectures will be recorded and posted on Brightspace. After the lecture, there will be time allocated to answer your questions.
If registered to ENVE 4105 (A2) problem analysis group, these sessions will be in MC 5010 on Fridays at 10 am. Other PA groups are online.
Software tutorial and problem analysis session videos will be posted on Brightspace.
Teaching assistants will hold office hours on two different timeslots.

Teaching Assistants
Email to make an appointment for an online one-on-one meeting. Following timeslots will be kept available.
TBA

Learning Objectives:
1. Understand metrics and methods to assess building performance
2. Understand integrated design process
3. Apply design principles for high-performing envelopes
4. Understand fundamentals of solar geometry and design of fixed shading systems
5. Understand principles of lighting and daylighting design
6. Perform steady-state thermal analysis
7. Understand common HVAC and building-integrated renewable energy systems

Supplementary text:

Software:
You may install these software on your personal computer or access them remotely via our virtual computer lab. See instructions for remote access to computers with the required software. [https://carleton.ca/dbom/wp-content/uploads/CEE-Computer-Lab-Instructions.pdf]
Course Plan:

Introduction
Lesson 1: Background in green buildings
Lesson 2: Course overview

Weather and climate
Lesson 3: Weather and climate metrics
Lesson 4: Air psychrometry
Lesson 5: Solar geometry

Tutorial 1: Climate data analysis in Climate Consultant
Tutorial 2: Working with data in EXCEL
Tutorial 3: Solving problems using psychrometric chart

Envelope
Lesson 6: Thermal analysis and design of building envelope
Lesson 7: Airtightness and natural ventilation
Lesson 8: Thermal properties of windows
Lesson 9: Design of fixed shading systems

Tutorial 4: Solving envelope design problems
Tutorial 5: Solving shading design problems
Tutorial 6: Envelope thermal analysis with LBNL Therm
Tutorial 7: Window thermal analysis with LBNL Window
Tutorial 8: Midterm review

Midterm

HVAC and renewable energy systems
Lesson 10: HVAC systems
Lesson 11: Steady-state load calculations
Lesson 12: Building-integrated renewable energy systems

Tutorial 9: Calculating sensible and latent heating and cooling loads
Tutorial 10: Calculating optimal PV spacing and estimating generation potential
Tutorial 11: Whole-building energy modelling with eQUEST

Lighting and daylight
Lesson 13: Lighting and daylight performance metrics
Lesson 14: Design and control for lighting and daylight
Tutorial 12: Computing daylight performance metrics
Tutorial 13: Daylight analysis in LBNL COMFEN

Design process and principles
Lesson 15: Passive solar design
Lesson 16: Integrated design process

Tutorial 14: Final exam review

Grade Distribution:
Midterm  20%
Four assignments  30%
Final exam  50%

Letter Grade Distribution:
>= 90.00    A+
85.00 - 89.99  A
80.00 - 84.99  A-
77.00 - 79.99  B+
73.00 - 76.99  B
70.00 - 72.99  B-
67.00 - 69.99  C+
63.00 - 66.99  C
60.00 - 62.99  C-
57.00 - 59.99  D+
53.00 - 56.99  D
50.00 - 52.99  D-
<= 49.99      F

Academic Regulations, Accommodations, Plagiarism University rules regarding registration, withdrawal, appealing marks, and most anything else you might need to know can be found on the university’s website [here].

Academic Accommodations for Students with Disabilities The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). Requests made within two weeks will be reviewed on a case-by-case basis. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (if applicable).

For Religious Obligations Students requesting academic accommodation on the basis of religious obligation should make a formal, written request to their instructors for alternate dates and/or means of satisfying academic requirements. Such requests should be made during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist, but no later than two weeks before the compulsory event. Accommodation is to be worked out directly
and on an individual basis between the student and the instructor(s) involved. Instructors will make accommodations in a way that avoids academic disadvantage to the student. Students or instructors who have questions or want to confirm accommodation eligibility of a religious event or practice may refer to the Equity Services website for a list of holy days and Carleton’s Academic Accommodation policies, or may contact an Equity Services Advisor in the Equity Services Department for assistance.

For Pregnancy Pregnant students requiring academic accommodations are encouraged to contact an Equity Advisor in Equity Services to complete a letter of accommodation. The student must then make an appointment to discuss her needs with the instructor at least two weeks prior to the first academic event in which it is anticipated the accommodation will be required.

Plagiarism Plagiarism is the passing off of someone else’s work as your own and is a serious academic offence. For the details of what constitutes plagiarism, the potential penalties and the procedures refer to the section on Instructional Offences in the Undergraduate Calendar.

What are the Penalties for Plagiarism? A student found to have plagiarized an assignment may be subject to one of several penalties including: expulsion; suspension from all studies at Carleton; suspension from full-time studies; and/or a reprimand; a refusal of permission to continue or to register in a specific degree program; academic probation; award of an FNS, Fail, or an ABS.

What are the Procedures? All allegations of plagiarism are reported to the faculty of Dean of FASS and Management. Documentation is prepared by instructors and/or departmental chairs. The Dean writes to the student and the University Ombudsperson about the alleged plagiarism. The Dean reviews the allegation. If it is not resolved at this level then it is referred to a tribunal appointed by the Senate.

Plagiarism and cheating at the graduate level are viewed as being particularly serious and the sanctions imposed are accordingly severe. Students are expected to familiarize themselves with and follow the Carleton University Student Academic Integrity Policy (See here). The Policy is strictly enforced and is binding on all students. Plagiarism and cheating – presenting another’s ideas, arguments, words or images as your own, using unauthorized material, misrepresentation, fabricating or misrepresenting research data, unauthorized co-operation or collaboration or completing work for another student – weaken the quality of the graduate degree. Academic dishonesty in any form will not be tolerated. Students who infringe the Policy may be subject to one of several penalties including: expulsion; suspension from all studies at Carleton; suspension from full-time studies; a refusal of permission to continue or to register in a specific degree program; academic probation; or a grade of Failure in the course.

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