

ENVE1001: Architecture and the Environment

Fall 2022

Lectures: Wednesdays 14:35-17:25 EST, SP303
Tutorials: Alternate Mondays 14:35-17:35 EST SP303

Professor: Prof. Liam O'Brien, Ph.D., P.Eng., email: Liam.OBrien@carleton.ca

Prof. O'Brien office hours: By appointment

TA contact: TBD

TA office hours: By appointment

Course description

This introductory course aims to familiarize students with key issues and strategies at the intersection of buildings and the built environment, the natural environment, and sustainability. It introduces students to a wide range of topics, including passive and active building design, building systems, energy, climate change – adaptation and mitigation, greenhouse gas emissions, weather and climate, water, sustainability and ecological footprints, building materials, building controls and operations, occupant health and comfort, life-cycle analysis, food, building codes and rating systems, cities and planning. These topics are explored individually and in relation to each other. The topics will be introduced conceptually but also quantitatively.

Learning objectives

After taking the course, students should be able to:

- Understand major building systems and design principles
- Understand energy flows through buildings and identify and propose strategies to reduce energy consumption
- Perform basic calculations to relate energy, power, heat, and temperature in the context of buildings
- Understand and characterize weather and climate
- Understand climate change and greenhouse gases
- Understand indoor environmental quality
- Understand and apply building codes and standards
- Understand water and nutrient cycles in the context of the built environment and food systems
- Understand and quantify ecological footprints and perform life-cycle analysis
- Understand the relationship between human land use and the environment
- Understand how to read building drawings and read technical specifications
and
- Use spreadsheets to perform basic quantitative analysis of the above topics
- Produce engaging and informative visualizations to communicate the above topics
- Know how to produce reasonable estimates, as applied to the built environment

Evaluation

Assignments (4 total, spaced at about 3-week intervals, with at least two weeks' notice)	40% (10% each)
Project	10%
Final Exam - Covers entire term; exam will be scheduled during the exam period.	50%

All evaluation (assignments, exams) will be in SI units. However, it would be beneficial for students to be comfortable with basic conversions to IP units (e.g., CFM).

Course Materials

Course/exam material consists of: freely available textbook chapters, blackboard notes, PowerPoint presentations, conference and journal papers, government reports, and building standards. Any material discussed by the guest lecturers are also testable on final exam.

Assignments

Four assignments will be given throughout the term. They will be posted a minimum of two weeks before they are due. Refer to course schedule on BrightSpace for deadlines. Late assignments will be accepted but with a 10% per day mark reduction. Assignments are to be completed individually; evidence of direct copying will be treated as cheating and will be handled accordingly (i.e., reported to the Dean's office).

Project

A group project will be assigned in the second half of term. It will be posted a minimum of four weeks before it is due. Pate projects will be accepted but with a 10% per day mark reduction.

Final Exam

The final exam is during the designated exam period and will cover all material (see *Course Materials*) taught during the course.

Software

1. Excel or GoogleSheets, etc.

Key reference texts

1. Short articles and readings will be posted most weeks, but there is no formal textbook. Reference guides can be suggested by the professor upon request.

General Regulations

Attendance: Students are expected to attend all lectures. The University requires students to have a conflict-free timetable. For more information, see the current *Undergraduate Calendar, Academic Regulations of the University, Section 1.2, Course Selection and Registration and Section 1.5, Deregistration.*

Appeal of Grades: The processes for dealing with questions or concerns regarding grades assigned during the term and final grades is described in the *Undergraduate Calendar, Academic Regulations of the University, Section 2.7, Informal Appeal of Grade and Section 2.8, Formal Appeal of Grade.*

Academic Integrity: Students should be aware of their obligations with regards to academic integrity. Please review the information about academic integrity at: <https://carleton.ca/registrar/academic-integrity/>. This site also contains a link to the complete Academic Integrity Policy that was approved by the University's Senate.

Plagiarism: Plagiarism (copying and handing in for credit someone else's work) is a serious instructional offense that will not be tolerated.

Academic Accommodation: You may need special arrangements to meet your academic obligations during the term. You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at <http://www.carleton.ca/equity/> For an accommodation request, the processes are as follows:

- **Pregnancy or Religious obligation:** Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see <https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf>

- **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*).
- **Survivors of Sexual Violence:** As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/sexual-violence-support/>.
- **Accommodation for Student Activities:** Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>

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