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**CIVE 551 – Advanced Building Science - 10607 - CIVE 551 - A01****Term – Fall 2020 (202009)**

We acknowledge with respect the Lekwungen peoples on whose traditional territory the university stands and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day.

**Instructor name**

Dr. Phalguni Mukhopadhyaya  
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Office: ECS 318

**Office Hours**

Days: Thursday & Friday  
Time: By Appointment Only  
Location: Online

**List all prerequisites and co-requisites:** None

**Course Objectives**

The primary objective of this course is to educate students about the engineering principles and processes associated with exterior building envelope design for optimum moisture and energy management. It is also the aim of this course to provide adequate background knowledge required to carry out forensic investigation of building envelope failures.

**Learning Outcomes**

On completion of this course students will be able to: (1) explain the fundamentals of heat-air-moisture transport mechanisms through building materials and exterior building envelopes, (2) define and explain the basic hygrothermal properties of building materials and their impacts on moisture management and energy performance of exterior building envelopes, (3) describe the test procedures to determine the hygrothermal properties of building materials and their limitations, (4) Explain the basic elements of exterior and interior climate climates critical for hygrothermal performance of exterior building envelopes, and (5) carry out hygrothermal and durability performance assessment of exterior building envelopes.

**Syllabus**

Scope and definition, heat-air-moisture transport mechanisms, hygrothermal properties, test methods, climate characterization, moisture management, durability index, energy efficient building envelopes, whole building energy performance, application of numerical simulation tools, forensic investigations.

A-Section(s): A01/CRN 10607

Days: Thursday

Time: 2:30 pm – 4:20 pm

Location: Online

## Required Text

Title: ASHRAE Handbook—Fundamentals  
Author: Edited by ASHRAE Technical Committee  
Publisher/Year: American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)/2017

## Optional Text

Title: Building Science for Building Enclosures  
Author: John F. Straube, Eric F. P. Burnett  
Publisher/Year: Building Science Press/2005

**References:** To be provided during the class.

## Assessment

<u>Weight &amp; Date(s) of Assessments</u>	<u>Weight</u>	<u>Date</u>
Assignments	20 %	Regular intervals (each week)
Mid-term	40 %	8 <sup>th</sup> week
Final Exam – Project Presentation and Report	40 % (10% Presentation, 5% Class room discussion and 25% Report).	Presentation will start from 11/12th week. Final reports and presentation slides to be submitted (e-copy) on or before Tuesday, December 15th 2020 (5:00 PM)

**NOTE:** Failure to pass the final exam will result in a failing grade for the course.

**Course Withdrawal Deadlines:** <https://www.uvic.ca/calendar/dates/index.php>

The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Graduate Calendar.

**There will be no supplemental examination for this course.**

**Grading:** Please see the Grading information in the current calendar at:

<https://www.uvic.ca/calendar/future/grad/index.php#/policies>

### Course policies and guidelines

**Late Assignments:** *No late assignments will be accepted unless prior arrangements have been made with the instructor at least 48 hours before the assignment due date.*

**Coursework Mark Appeals:** *All marks must be appealed within 7 days of the mark being posted.*

**Attendance:** We expect students attend all lectures and labs. It is entirely the students' responsibility to recover any information or announcements presented in lectures from which they were absent.

**Electronic devices in labs and lectures:** No unauthorized *audio* or *video* recording of lectures is permitted.

**Electronic devices in midterms and exams:** Calculators are only permitted for examinations and tests if explicitly authorized and the type of calculator permitted may be restricted. No other electronic devices (e.g. cell phones, pagers, PDA, etc.) may be used during examinations or tests *unless explicitly authorized*.

**Plagiarism:** Submitted work may be checked using plagiarism detection software. Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the link given below for the UVic policy on academic integrity. Note that the university policy includes the statement that "A largely or fully plagiarized assignment should result in a grade of F for the course."

**Academic Integrity:** You must make yourself aware of the University of Victoria guidelines and policy concerning fraud and academic integrity at this link, <https://www.uvic.ca/current-students/home/academics/academic-integrity/index.php>

**Policy on Academic Integrity:** <https://www.uvic.ca/calendar/future/grad/index.php#/policies>

**Standards of Professional Behaviour:** You are advised to read the Faculty of Engineering Document Standards for Professional Behaviour in current Graduate Calendar, which contains important information regarding conduct in courses, labs, and in the general use of facilities. Please find the document at this link: <https://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf>

**Notes to Students:**

Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the Chair of the Department by email or the Chair's Secretary to set up an appointment.

**University of Victoria Privacy Policy:** If any student has concerns about their private information being stored or accessed outside of Canada, they are required to inform the course instructor about their concerns before the end of second week of classes.

**Accommodation of Religious Observance:** See entry in current Graduate Calendar.

**Equality:** This course aims to provide equal opportunities and access for all students to enjoy the benefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the essential requirements of the course. The accommodation will not alter academic standards or learning outcomes, although the student may be allowed to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or confidential medical information to the course instructor. If you believe that you may require accommodation, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for appropriate accommodation. Alternatively, you may want to contact the Centre for Accessible Learning located in the Campus Services Building, <https://www.uvic.ca/services/cal/>.

The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.

**Sexualized Violence Prevention and Response at UVic:** UVic takes sexualized violence seriously, and has raised the bar for what is considered acceptable behaviour. We encourage students to learn more about how the university defines sexualized violence and its overall approach by visiting [www.uvic.ca/svp](http://www.uvic.ca/svp). If you or someone you know has been impacted by sexualized violence and needs information, advice, and/or support please contact the sexualized violence resource office in Equity and Human Rights (EQHR). Whether or not you have been directly impacted, if you want to take part in the important prevention work taking place on campus, you can also reach out:

**Where:** Sexualized violence resource office in EQHR; Sedgewick C119

**Phone:** 250.721.8021

**Email:** [svpcoordinator@uvic.ca](mailto:svpcoordinator@uvic.ca)

**Web:** [www.uvic.ca/svp](http://www.uvic.ca/svp)

**Policy on Inclusivity and Diversity:** See the entry in the current Graduate Calendar.

**Course Lecture Notes**

Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.

### **Syllabus statement**

A note to remind you to take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone.

**Counselling Services** - *Counselling Services can help you make the most of your university experience. They offer free professional, confidential, inclusive support to currently registered UVic students.*

<https://www.uvic.ca/services/counselling/>

**Health Services** - *University Health Services (UHS) provides a full service primary health clinic for students, and coordinates healthy student and campus initiatives.* <http://www.uvic.ca/services/health/>

**Centre for Accessible Learning** - *The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations* <https://www.uvic.ca/services/cal/>. *The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.*

**Elders' Voices** - *The Office of Indigenous Academic and Community Engagement (IACE) has the privilege of assembling a group of Elders from local communities to guide students, staff, faculty and administration in Indigenous ways of knowing and being.*

<https://www.uvic.ca/services/indigenous/students/programming/elders/index.php>

The [Office of the Ombudsperson](#) is an independent and impartial resource to assist with the fair resolution of student issues. A confidential consultation can help you understand your rights and responsibilities. The Ombudsperson can also clarify information, help navigate procedures, assist with problem-solving, facilitate communication, provide feedback on an appeal, investigate and make recommendations.

Phone: 250-721-8357; Email: [ombuddy@uvic.ca](mailto:ombuddy@uvic.ca); Web: [uvicombudsperson.ca](http://uvicombudsperson.ca).