ARCH 673: THE SCIENCE OF THE BUILDING ENCLOSURE

"How to make buildings that work"* or *"How to practise architecture and not get sued"

Outline

This course provides an advanced study of the building enclosure (called the "envelope" in the past) as the place where design, technology, performance, environmental and professional concerns converge. The course advances beyond Arch 364 in depth and scope. The focus of this course is on the practical technical needs of architects specifying, designing, and detailing building enclosures -- walls, windows, roofs, foundations etc. The emphais is on typical Canadian architectural practise, which means cold climate, hot-humid commercial, institutional, and high-rise residential buildings. However, differences to building in other climates and contexts (e.g., Dubai, Houston, Shanghai, Las Vegas). There will be a bias towards buildings with the high performance goals required by new energy regulations and owners seeking low- and net-zero-energy buildings. Minimum performance expectations will be identified however.
The performance of building materials, a review of the benefits and limitations of the different types of enlclosures, and the detailing of the many common enclosure assemblies. Mechanical environmental devices, including lighting, will be discused alongside daylighting, shade, and ventilation as they relate to the choices made by architects about enclosures. Site design, orientation, and massing as it relates to building performance are briefly reviewed and integrated.

Lectures:

Fridays 2:00 PM to 4:50 PM in CAM ARC2026

Format

Lectures w/case studies, slide shows, physical samples, case studies. Some simple equations, mostly concepts and design principles.

Instructor:

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TextBook

Required Course Textbook *High Performance Building Enclosures*, sold in class at discount.
Readings will be provided on UW-Learn site: the "Readings" folder are required reading.
Other references: *Architectural Detailing* by Ed Allen, and Linda Brocks *Designing the Exterior Wall*, all CMHC *Best Practise Guides* (all of these are in the library)

Marking Scheme

Projects: 20%	Assigned group design project/presentation
Project #2: 50%	Design project: detail enclosure drawings. Due Dec 1
Exam #1: 30%	Written exam in final exam period

Late submissions: No projects will be accepted past the final exam date, and will be assigned a mark of zero, i.e. a course failure, without a doctors note. Attendance of the lectures is important, required, and assumed.

Projects

The first project involves the detail design of a building enclosure for a specific building type-climate-exposure combination. A fine scale drawing must be submitted, identifying layers, arrangement and materials identified, and presented/explained to the class in groups of three or four.

The second project will require the submission of details of numerous prescribed (4) enclosure component intersections of a building. The final project is due Friday Dec 4, in paper form (with electronic as backup). More information will be provided on the final project later in the course.

Important Fine Print

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check www.uwaterloo.ca/academicintegrity/ for more information.] This includes no copying others' work, referencing sources of ideas, photos, etc.

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4, www.adm.uwaterloo.ca/infosec/Policies/policy70.htm. When in doubt please be certain to contact the School's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity [check www.uwaterloo.ca/academicintegrity/] to avoid committing an academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline, www.adm.uwaterloo.ca/infosec/Policies/policy71.htm. For typical penalties check Guidelines for the Assessment of Penalties, www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm.

Appeals: A decision made or penalty imposed under Policy 70 (Student Petitions and Grievances) (other than a petition) or Policy 71 (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals) www.adm.uwaterloo.ca/infosec/Policies/policy72.htm.

Note for Students with Disabilities: The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.