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 enclosure -- walls, windows, roofs, foundations etc. Emphasis is on commercial buildings with the high performance goals required by new regulations and owners seeking low- and net-zero-energy buildings.

ARCH 673 discusses matters such as or the short- and long-term behaviours of building materials, the selection and detailing of the most common enclosure assemblies, assesses the use of new generations of "smart" mechanical environmental devices alongside daylighting, shade, and ventilation. Site design, orientation, and massing as it relates to building performance are briefly reviewed. Iteractions of the enclosure and environmental systems (lighting, ventilation, HVAC) will be covered as needed to allow for the assessment of the building as a system.

Lectures:

Mondays 2:00 PM to 4:50 PM in 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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Office hours: to be arranged in class to suit needs

TextBook

Require Course Textbook *High Performance Building Enclosures* by J Straube, 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 in library)

Marking Scheme

Projects: 20%	Fast design exercise, presented in class in groups
Project #2: 50%	submit in two stages: 2 page proposal, Dec 7 project submission
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 failure, without a doctors note. Attendance of the lectures is important, required, and assumed.

Projects

The first project involves the detail design of an enclosure for an instructor-assigned building type-climate-exposure combination. A fine scale drawing must be submitted, with layers, arrangement and materials identified, and presented/explained to the class.
The second project will require the submission of details of numerous prescribed (5) enclosure component intersections of a building. In Phase I, building details are to be submitted for approval on Nov 12 before the project proceeds. Electronic submissions accepted. The final project is due Dec 7, in paper form. More information will be provided on the final project.

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.]

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.