

ARCH 673: THE SCIENCE OF THE BUILDING ENCLOSURE

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

Outline

The calender states: "The building envelope has become the single most significant and element within the contemporary economy of building. It bears much of the identity and amenity of buildings, is the site of significant expenditure, the occasion of environmental concern and attention, the object of much technological innovation, and the locus of entropy. This course provides an advanced study of the building envelope as the place where design, technology, building science, and environmental concerns converge. It discusses matters such as natural light and ventilation or the short- and long-term behaviours of building materials, and assesses the use of new generations of "smart" mechanical environmental devices." We will also briefly review site design, orientation, and massing as it relates to building performance.

The course advances beyond Arch 364 in depth and scope. The focus of this course is on the practical tehcnical needs of the architect, i.e., the design, rehabilitation, construction and operational aspects of the building enclosure -- walls, windows, roofs, foundations etc. 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 1:00 PM to 4:00 PM in ARC2026

Format

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

Instructor:

Dr John Straube, P.Eng.

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Office hours: to be arranged in class to suit needs

TextBook

Copious readings will be provided on UW-ACE: the "Readings" folder are required reading

Supplemental download: *High Performance Building Enclosures Course Manual* by J Straube

Recommended: *Architectural Detailing* by Ed Allen, *Building Science for Building Enclosures*, by J Straube and E Burnett and Linda Brocks *Designing the Exterior Wall* (in library)

Projects and Marking Scheme

Projects: 20% In-class design exercises

Project #2: 40% submit in two stages: Nov 8 2 page outline, Dec 6 project submission

Exam #1: 40% 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

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.