Terri Meyer Boake, BES, BArch, MArch, LEED AP
Professor School of Architecture University of Waterloo
email: tboake@uwaterloo.ca

Arch 671: Comprehensive Building Design TECHNICAL REPORT

Fall 2017 Course Home Page

course outline

last updated October 22, 2017 7:55 PM

Course Description:

"Students will investigate and report on technical issues as the relate to the development of the comprehensive building project in the parallel Design Studio. Innovation and integration in architectural design will be stressed, with respect to structure, building envelope, environmental systems, health and life safety, movement systems, site planning and the integration of information technology."

Office Hours:
Tuesdays and Wednesdays 1:00pm to 2:00pm, ARC 3012 or TBA
Email tboake@uwaterloo.ca anytime

Log-in to LEARN: here

Schedule of Lectures:

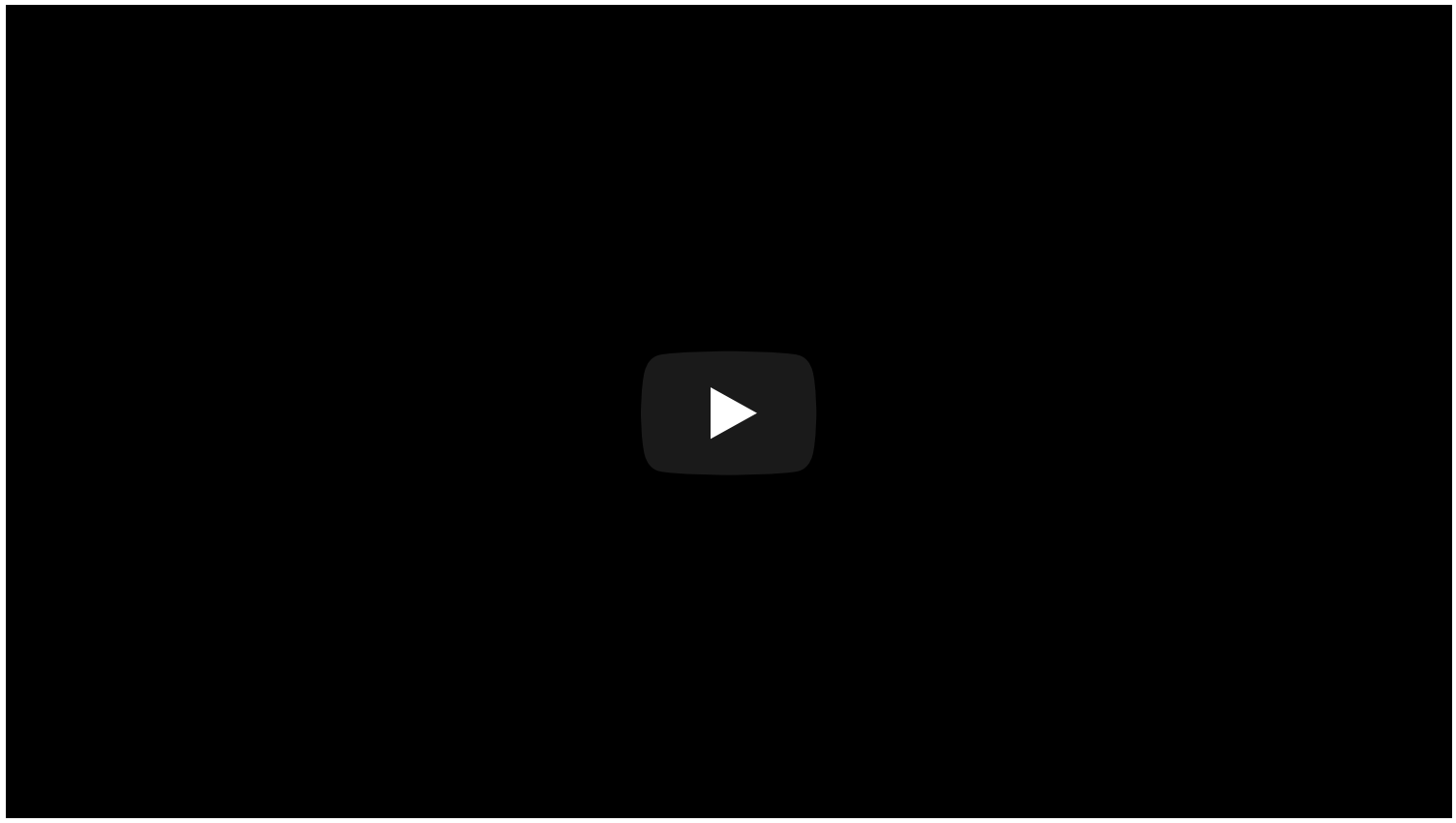
A series of supplemental technical lectures will be run on the dates listed below, Wednesday mornings from 10 to 12, ARC 2026. As you are all taking Arch 673: The Science of the Building Envelope, the focus of these talks will be more on structural, environmental and life safety/code issues.

DATE	TOPIC
Sept 13	**Designing for Climate** powerpoint

Sept 20

Structural Choices and Architectural Design

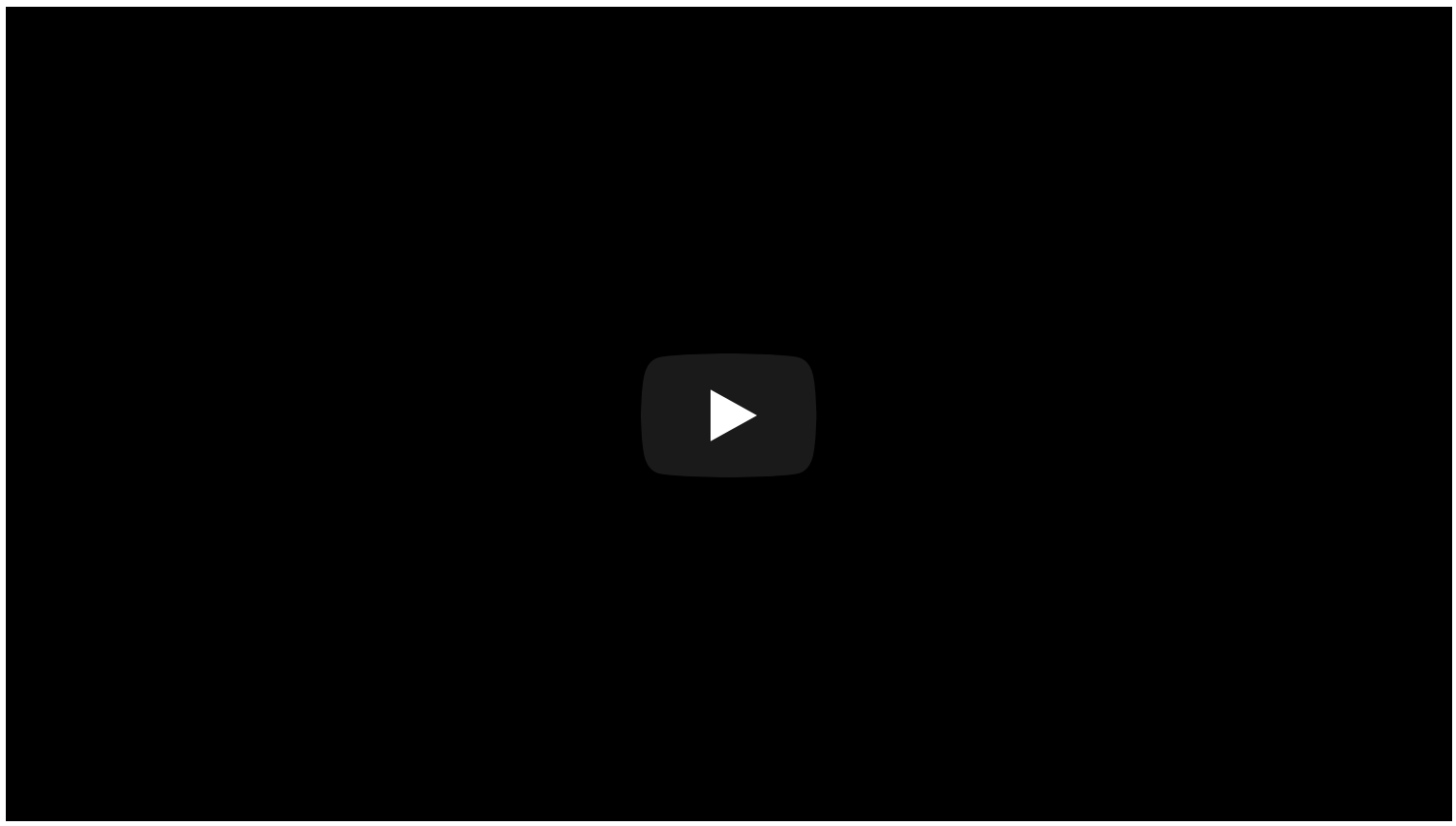
A look at various systems for creating structures that can positively influence the architectural outcome of spaces. Focus on medium to long spans to assist in the creation of your main community space. Focus on steel and concrete systems.



Sept 27

We are in Canada and we have lots of Wood...

Canadian architectural design takes great advantage of the materiality of wood, from light frame construction for our houses to heavy natural timber, glue laminated timbers and various engineered wood projects for longer spans in institutional buildings. This lecture will focus on the use of heavier exposed wood systems that have long been associated with community and institutional buildings.



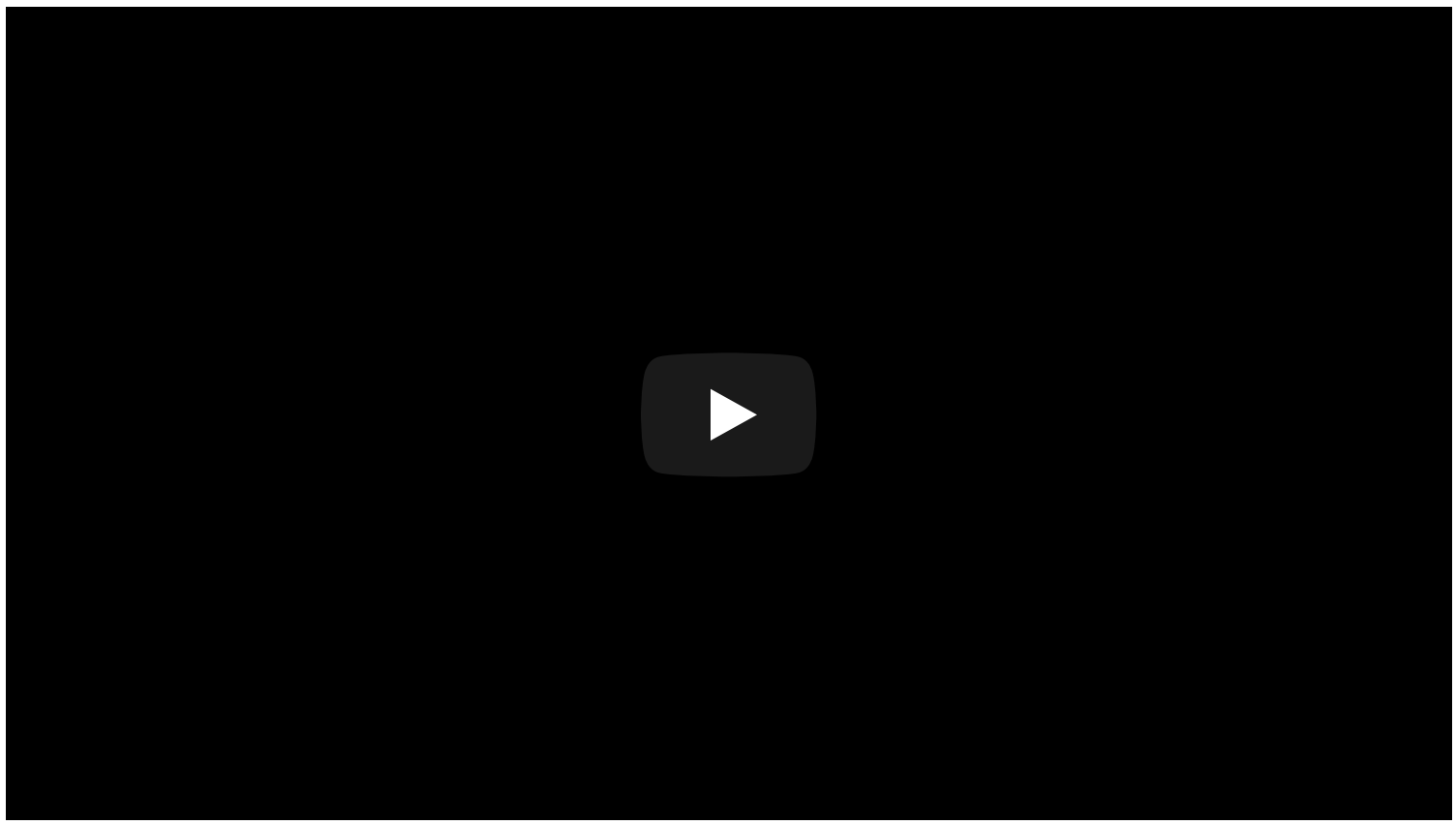
Basic presentations on wood construction from my first year class:
Structure and Properties of Wood, Engineered Wood, Post and Beam Construction

Oct 4

The Question of Sustainable Design in the Canadian Context

A review of green building practices in a cold climate with an emphasis on learning the LEED Accreditation system

	that is supported by the CaGBC and USGBC. LEED Basics powerpoint, Mining LEED for Carbon powerpoint solar geometry and shading, passive heating, passive cooling
Friday Oct 13	**Structural Designing in Exposed Steel** A more detailed look at Architecturally Exposed Structural Steel, connections, expression, protection. A focus on the application of "force differentiated structures" - those that acknowledge tension vs compression forces in the member choices. Steel: Fun is in the Details Website
Oct 18	**Facades** To complement the detailing being studied in Arch 673, we will look at various innovative cladding systems using some new materials, with a focus on the incorporation of the mandatory rain screen as well as shading devices to provide control of solar gain.



Oct 25	**Roofing Systems** A look at the application of the various materials for pitched and flat roofs. Detailing for flashing at roof edges. Incorporation of green roofs. Where the roof meets the wall.
Nov 1	No class. Terri at CTBUH Conference in Sydney
Nov 8	Desk crits in studio
Nov 15	Desk crits in studio
Nov 22	Desk crits in studio
Nov 29	Desk crits in studio

Evaluation:

The grade assessed will be based on Written Report (20%), Comprehensive LEED Evaluation (10%) and the drawings (70%). In the

report I will be looking for completeness and clarity of writing – adherence to the outline provided.

The building must be designed to meet a minimum LEED Gold standard. Additional grade points are possible for hitting LEED Platinum. The LEED spreadsheet MUST include a short PARAGRAPH for each credit explaining why you did or did not claim this credit. No calculations are necessary, just a good explanation.

Link to the base document for the written portion of the submission.

Link to the LEED excel spreadsheet - you will be using the LEED V4 system.

Link to the LEED V4 Reference Guide

For the drawing breakdown:
Structure 10%
Skins/Envelope Design 10%
Energy Efficient Design Strategies 10%
Environmental Systems and Services: HVAC, Acoustics, Lighting 10%
Life Safety 10%
Barrier Free Design 5%
Environmental Site strategies 5%
Presentation quality 10%

It is assumed that you will be using the same basic set of drawings to submit to Arch 691 Design Studio. The information required for the Technical Report component should be layered on the studio submission materials. It will be critically important that your basic design strategies for the studio project support the technical strategies.

Due Date: 11:59pm December xx to LEARN.

Late Penalties:
Projects or assignments submitted after the due date or due time will be penalized 5% per calendar day of lateness, with no maximum.

Sample Report:
This is a copy of a Technical Report for you to look at in order to understand the nature of the expectations of the submission. Do NOT copy the detailing as it is likely to be quite different from what you are using given the change in building type.

Recommended References:

In addition to the texts used for your Structures and Building Science classes last term and this term:

CMHC Best Practice Design Guides.

Wood Frame	link
BC (Humid Climate!) Wood Frame	link
Precast	link
Curtain Wall	link
EIFS	link
Brick - Steel Stud Backup	link
Brick - Concrete Block Backup	link
Healthy High Rise	link
Fire and Sound Design	link
Flashing	link
Bakor - Air Barriers	link

The National or Ontario Building Code.

Allen, Edward. Architect’s Studio Companion.

Allen, Edward. Fundamentals of Building Construction: Materials and Methods.

Allen, Edward. How Buildings Work. Oxford University Press, New York, 1995. ISBN 0-19-509100-0. A comprehensive general book with an appropriate title. Includes all aspects.

Salvadori, Mario. Why Buildings Stand Up. WW Norton & Co, 1994, ISBN 0393306763. A must for the architect who wishes an overview of systems, shapes and materials used for building structures.

Gordon, J.E. Structures: Or Why Things Don't Fall Down. Penguin Books, 1978. An interesting, informative, and still remarkably technical read. This book is more materials based and slightly more technical than Salvadori's.

Brand, Stewart. How Buildings Learn. A very influential book that thoroughly describes the life cycle of buildings in a case study approach. Excellent review of how building professions are not doing their jobs.

Stein, Benjamin and John Reynolds. Mechanical and Electrical Equipment for Buildings. John Wiley & Sons.

Lechner, Norbert. Heating, Cooling, Lighting. John Wiley & Sons, Toronto.

Brown, G.Z. Sun Wind and Light. Very good book on environmental design. Lots of info on daylighting.

Avoidance of Academic Offenses

Academic Integrity: To create and promote a culture of academic integrity, the behaviour of all members of the University of Waterloo is based on honesty, trust, fairness, respect and responsibility.

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, http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm

Discipline: A student is expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline, http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm

Appeals: A student may appeal the finding and/or penalty in a decision made under Policy 70 - Student Petitions and Grievances (other than regarding a petition) or Policy 71 - Student Discipline if a ground for an appeal can be established. Read Policy 72 - Student Appeals, http://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. Once registered with OPD, please meet with the professor, in confidence, during my office hours to discuss your needs.

last updated October 22, 2017 7:55 PM