

ARCH 407/507: DESIGN INTEGRATION AT THE BUILDING ENCLOSURE

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Contact: This class will be designed to operate remotely until further notice. Whole group contact times will be limited, but if needed they will occur between 2:00PM and 3:00PM on Tuesday. Individual electronic conferences, if needed, will be scheduled between 2:00PM and 4:00 PM, Tuesday and Thursday. Much of the exchange will occur asynchronously through email, with periodic submissions and feedback.

Credits: 2 Credit Hours, P/N grading only

Prerequisites: Open to students enrolled in continuing terminal studios.

The goal of this supplemental seminar is to apply your understanding of the major issues of ARCH 471/571: Building Enclosure to the development of your terminal studio project. You will be asked to build and maintain an illustrated narrative essay describing the design parameters and decision making process as you work through the development of your studio project. Your study will conclude with wall sections and details to be incorporated into the presentation of your work at final reviews.

During the first term of terminals you should have developed a strong scheme for the overall project, but you may be engaged in revisions based on your recent review. In this seminar, you will begin by making a technical proposal about the enclosure systems. Imagine that a schematic design, cost estimate needs to be prepared to establish the project budget and square footage. To do this your cost estimator wants to know, in advance of the final design, what you think you will be using for the envelope of the building. You have to perform a systematic analysis of the choices based on what you do know at each stage, and you must explain those choices. As an obvious example, if you are working on a campus where all of the buildings have a particular red brick, you might be willing to propose that you will use at least some red brick.

As a guide to this exercise, consider the outline below, which was more or less the outline of the lectures on large scale cladding systems in Building Enclosure. Stages one through four are the "outline specification," to be completed as a narrative essay with diagrams, sketches and appended reference material. (Your will be expected to draw from visual materials prepared for studio to provide background for the specific choices you are making.) Stages five and six are a critique of the enclosure system, and of the project scheme as the design development process proceeds. These two could take the form of a short essay, or self-critique. Stages seven, eight and nine are the design development process; to be completed with appropriate wall sections, elevation studies and key details. Stage ten is a self-assessment that you would want to make at the conclusion of the design development period. If your arguments in the earlier sections are clear, this final portion should be a very brief summation.

The objective of the course is to inspire you to move through these decision stages on a schedule that is compatible with the progress of your studio work. Resource materials from Building Enclosure will be migrated to a new Canvas site for the course.

Cladding for Large Scale Buildings:

1. Establish performance requirements for the entire skin:
 - A. Schematic requirements: concepts of the project and context of the site as they relate to the enclosure systems.
 - B. Technical requirements: daylight, thermal control, water control, etc.
 - C. Construction principles: need for pre-fabrication, long term durability or maintenance issues, special problems of the site regarding access for construction, or for supply of materials, etc.
2. Define the patterns of solid and void that reinforce the larger concepts of the building:
 - A. Consider functional requirements behind the skin.
 - B. Determine the amount of opening that is appropriate to those uses.
 - C. Examine the flexibility needed for a good interior design over the life of the building.
 - D. Bring an appropriate order to the facade.
 - E. Examine the geometric options for controlling solid and void.
 - F. Consider the column position relative to the enclosure wall plane.
3. Make preliminary decisions about the performance characteristics of the openings.
 - A. Determine the glass area and select the glazing type.
 - B. Consider the use of facade leaves (layers), projections and operable sunshades to control the openings.
 - C. Establish the operable portions of the glazing and study the visual impact on the whole.
4. Make preliminary decisions about the major zones of the facade.
 - A. Respond to the project context: both in time and place.
 - B. Satisfy the requirements for watertight construction.
 - C. Address structural requirements: resist wind loads.
 - D. Establish an efficient and effective construction process.
 - E. Provide for the integration of services.
 - F. Set economic parameters for the skin: quality of materials.
5. Review the basic decisions made to this point. (Transition from schematics to design development.)
 - A. Is there a good fit between your design intentions and the technical characteristics of the enclosure system?
 - B. Is the overall expression of the system satisfactory?
6. Reconsider the performance of the wall as a whole.
 - A. What design and performance criteria have been overlooked?
 - B. Can the chosen system be adapted to meet these criteria?
7. Detail the major zones (traditionally the solid portions) of the facade.
 - A. Make final selection of systems for the majority of the wall surfaces.
 - B. Specify the joining techniques between units in the system: horizontally and vertically.
 - C. Detail the back-up systems and means of attachment.
8. Detail the unique features (traditionally the openings).
 - A. Examine boundary conditions at tops, bottoms, at the openings in a system or changes between systems.
 - B. Specify the glazing assemblies, especially the operable components.
 - C. Integrate glazing systems into the overall wall system.

9. Detail the joints.
 - A. Examine all the interfaces where different subsystems join one to another.
 - B. Develop a logical set of custom joints to meet special conditions.
 - C. Verify the sequence of assembly and allow for field adjustments.

10. Evaluate the results.
 - A. How many of the original design objectives have been satisfied.
 - B. What hidden consequences arose out of the initial selections?
 - C. Have those consequences been resolved in a satisfactory manner?