

Course Syllabus:

A4113 ENVELOPES IN ARCHITECTURE

FALL 2017

1. Class Description & Objectives

This course explores the design of building skins to comply with a set of performances while turning an architectural concept to a finished system product. Potential material and systems will be explored for different areas of the building that satisfy the architectural and functional constraints along with these performance goals.

The class will be taught as lectures that will include case studies of real projects as well as introduction of tools to improve the system performances and optimize the envelope geometry. Assignments will consist of hand calculations and software design of sections of façade systems.

The final aim of the course is to teach students the process of defining an envelope strategy while conceiving complex geometry systems and to give an overview of the different parties involved in the decision making process in the American and overseas markets.

2. Class Hours

Lectures: Thursday 10am - 1 pm 114 Avery
Reviews: 5 Reviews, at the same time of the lectures. Reviews will begin at 11:30am. All students must be present for the full review from 11:30am and 1pm.

3. Instructors & Critics

Professor: Silvia Prandelli, sp3372@columbia.edu

Critic Team #1	Façade	TBC	
Critic Team #2	Façade	TBC	
Critic Team #3	Façade	TBC	

4. Course Requirements

- Attendance
Students are expected to attend all classes. When absence is justifiable and unavoidable, students are expected to contact the class TA, copying the instructor, outlining the date that will be missed and the reason. Two unexcused absences will result in a low pass. Three or more unexcused absences will preclude a passing grade in the class.
- Assignments
All assignments will be individual and to be submitted on the requested dates.
- Final presentation
A final presentation on the design of the façade system selected during phases 2 and 3 will be evaluated at the same time of the final presentation for AT IV BUILDING SYSTEMS INTEGRATION. Students will be required to bring any relevant materials to the classroom.

5. Grading

Project development is a team effort. Cohesive group participation is critical to a successful project. Grades are assigned in groups. On the rare occasion, individual grades may be awarded for exceptional performance within a group. Grading is based on the following criteria:

Assignments	30%
Enclosure System Concept	10%
Quality of Drawings and Oral Presentation	30%
Attendance and Participation	30%

6. Class References

The following is a list of optional resources:

- Detail in Contemporary Glass Architecture Publisher: Laurence King Publishing (\$35)
- Facades: Principles of Construction Publisher: Birkhauser (\$49)
- In Detail: Building Skins: Concepts, Layers, Materials Publisher: Birkhauser (\$99)
- Kinetic Architecture: Designs for Active Envelopes Publisher: Images Publishing (\$80)

7. Class Schedule & Outline

- **Phase 1 - Performances Introduction:** students will be shown processes to select the most appropriate skin solutions in line with the Architectural intent and the required performances via in class presentations and site meetings with industry representatives.
- **Phase 2 - Analysis and Construction:** students will work in groups and analyze a set of performances on the AT IV BUILDING SYSTEMS INTEGRATION project in order to finalize a set of possible options. These options will be then evaluated via a construction of a physical mock up for constructability or computer generated tools to optimize a set of performance parameters. Students will finally present their strategy and findings.
- **Phase 3 – Innovation:** a set of presentations by industry representatives will inform the student design carried out during the second phase of this course. Students will have an option to review their design following the presentations to include for an innovative approach.

Expected lecture topics are listed below. The final schedule will be provided during the first class.

1	Phase 1 Performances Introduction	Understanding the Design Intent
2		Structural Design
3		Environmental Requirements and Weather Performance
4		Lighting Design
5		Geometry Modeling and Constructability
6		Supply Chain and Budget Costing
7		Acoustics
8		Durability
9	Phase 2 Analysis and Construction	Analysis & Construction
10		Project reviews
11	Phase 3 Innovation	Industry presentations
12		Project reviews
13	Final Presentation	