


University of Massachusetts Amherst
Department of Architecture

ARCH 605-1 / Sustainable and High-Performance Facades Seminar / Summer 2020

Number of Credits: 3
Time and Location: Mon / Wed 11:00 AM – 2:00 PM / Online (May 18 to June 26, 2020)

Instructor: Ajla Aksamija, PhD, LEED AP BD+C, CDT
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Overview: This graduate seminar course is intended to develop students' skills in designing sustainable, high-performance building facades and to broaden their knowledge about sustainable facade materials, design methods, systems, simulation and modeling tools, and facade performance. The course is structured to allow students to learn about the design methods and approaches, analyze properties of facades, and also incorporate specific design strategies to develop viable solutions for innovative facades.

The students will learn about the advances in technology, sustainable and high-performance facades, building simulations and energy modeling, materials and their environmental impact, design and technical documentation.

This online course will cover the following topics:

- What are the appropriate design strategies for different climate types?
- How to choose facade types and materials to improve their performance?
- How to treat different building orientations?
- What are the best passive design methods for improving the performance?
- What are the best methods for daylighting?
- How to improve thermal comfort with facade designs?
- How to balance opaque and glazed areas of the facade?
- What are the appropriate simulation tools and analysis procedures for sustainable facade systems?
- What are the emerging technologies and materials for facades?

What can students expect to learn by studying this course?

- Research methods
- Sustainable design methods for facades
- Emerging facade technologies
- Methods for improving thermal performance, daylight and building occupants' comfort through facade design
- Advanced construction materials
- Environmental impact of facade systems
- Building performance tools and simulations
- Analytical processes for facade design
- Preparation of technical documentation
- Testing procedures for facades
- Development of design communication skills through written, verbal, 2D and 3D formats.

Textbook:

Aksamija, A., (2013). *Sustainable Facades: Design Methods for High-Performance Building Envelopes*, Hoboken, NJ: Wiley.