

Fall 2024

Arch 483-107: Architectural Galss Design and Prototyping

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NJIT FALL 2024

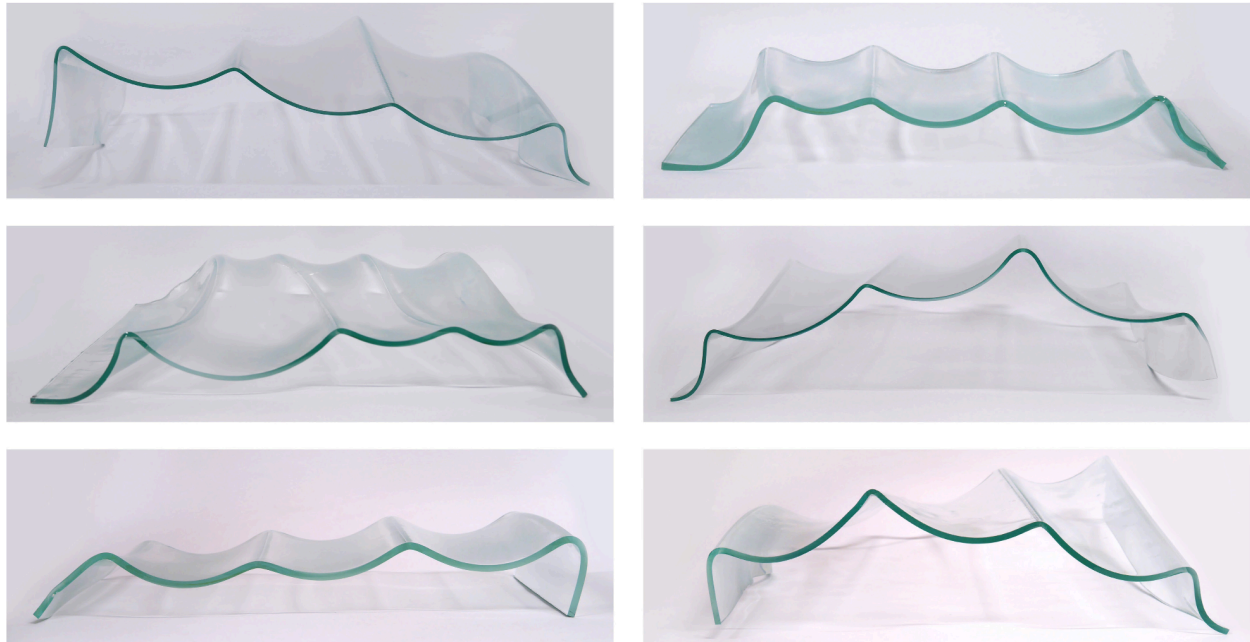
INSTRUCTOR: Gosia (Malgorzata) Pawlowska

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ARCH483 ST: Architectural Glass Design & Prototyping

Face-to-Face Course – 3 Credits – Wednesday evenings 6:00 pm - 8:50 pm

Class Location: TIER 108 – Office Hours: Wednesdays 5:00 pm - 6:00 pm or by appointment



COURSE OVERVIEW

How can architects leverage the material intelligence of glass, to the benefit of design and functionality in the built environment? This course will examine glass as a material, both through case studies of existing precedents in art and architecture, and a hands-on prototyping exercise made possible thanks to collaboration with a local glass studio in Newark, [Glassroots](#).

By learning from traditional craft techniques we will speculate how emerging technologies have the potential to expand the performance and environmental effects of architectural glazing. Previous experience with glass is not required. Students can expect to gain a basic understanding of glass material properties, mold-making processes, and the challenges and opportunities that exist around the design and manufacture of architectural glass systems.

We will begin the semester with a lecture series to contextualize our research within the history of architectural glass, from the cathedral window to contemporary examples of innovative glazing. Lectures will be supplemented by readings, discussions, and case studies.

The second half of the semester will consist of a collaborative design and making exercise investigating new methods of digital tooling for glass fabrication. Students will work in groups to develop molds for glass following a design for manufacture workflow- 3D modeling and producing a physical prototype using the tools and facilities available at the NJSOA fabrication shop and the hot glass studio at Glassroots. Demonstrations will be given and students can expect generous assistance throughout the process when new techniques are introduced.

REVISED SCHEDULE

Dates below are subject to change, all assignment deadlines will be confirmed within 2 weeks.

Week(s)	Description	Location
09/04	Lecture: Survey of architectural glass history	NJIT Classroom
09/11	Case studies (Assignment 1)	NJIT Classroom
09/18	Guest talk from facade designer (Haya Alnibari, Front inc), Discussion of Assignment 2 , intro to prototyping exercise	NJIT Classroom
09/25	Guest talk from Michael Haddy (Steven Holl Architects), review of goals for glass prototyping exercise, early sketches	NJIT Classroom
10/2	Workshop orientation- intro to CNC milling + Concept Review	DigiFab Lab
10/9	Workshop demonstration: mold-making for glass	Casting Lab
10/16	Workshop session- CNC milling	DigiFab Lab
10/23	First Visit to Glassroots- Demonstration (TBD)	Glassroots
10/30	Workshop session: mold making for final prototypes	Casting Lab
11/6-13	Visit to Glassroots for demonstration and hands-on exercise	Glassroots
11/20-27	Final Presentation of prototypes & research	TBD
12/4-11	Studio Reviews- no class	N/A
12/18	Final Submissions Due	Virtual

GRADING

Class participation and engagement: 20%

Case Studies (written report and presentation) + sketch assignments: 25%

Design Development for prototyping exercise (mid-term presentation): 25%

Outcome of prototyping exercise (final presentation with physical model): 30%

LEARNING OUTCOMES

This course will guide students to competently achieve the following:

- Analyze various historic and contemporary examples of architectural glass design.
- Discern the challenges and opportunities inherent in the material, understanding its properties and limitations through readings, lectures, and case study presentations.
- Demonstrate skills in academic research through discussion and assignments.
- Develop a unique design proposal/ proof-of-concept prototype aligned with class objectives.
- Gain new skills related to fabrication of molds for glass and apply these to produce a physical object. Be able to reflect on this process and share insights at the end of term.

MATERIALS

Since this elective course is structured around producing a physical prototype, there will be a materials fee of approximately **\$100/student** which will cover supplies such as foam, plaster, glass, and equipment rental costs at Glassroots (an external studio). Please contact the instructor by email if the materials fee is prohibitive to your participation in the course.

TEXTBOOKS

No textbooks required. Any assigned readings will be made available in PDF/ digital format.

SOFTWARE

Students are expected to have computer access throughout the semester to complete assignments, however laptops are not required during each class session. Basic operational knowledge of the following software is preferred: Rhino 3D, Adobe Creative Cloud.

ATTENDANCE

Attendance will be considered as part of an overall student engagement grade alongside active collaboration and class participation. Students are expected to attend all regularly scheduled classes, and prior notification is required in case of any absence or tardiness. Three or more unexcused absences will require a meeting with the instructor and the student's advisor.

KEPLER/ CANVAS

NJSOA students are required to upload all graded work to Kepler in order to receive a passing grade.

NAAB PERFORMANCE CRITERIA

The National Architectural Accrediting Board (NAAB) accredits NJIT's architecture program. The NAAB has Program and Student Criteria that must be covered by any architectural curriculum to attain their approval. This course satisfies the following criteria in full or partially:

Design: Architects design better, safer, more equitable, resilient, and sustainable built environments. Design thinking and integrated design solutions are hallmarks of architecture education, the discipline, and the profession.

Knowledge and Innovation: Architects create and disseminate knowledge focused on design and the built environment in response to ever-changing conditions. New knowledge advances architecture as a cultural force, drives innovation, and prompts the continuous improvement of the discipline.

Lifelong Learning: Architects value educational breadth and depth, including a thorough understanding of the discipline's body of knowledge, histories and theories, and architecture's role in cultural, social, environmental, economic, and built contexts. The practice of architecture demands lifelong learning, which is a shared responsibility between academia and practice.

LEARNING AND TEACHING CULTURE POLICY

In addition to the overarching values and ethics of the university, the NJSoA is dedicated to optimism, diversity and solidarity, professional conduct, constructive evaluation and instruction, collaborative community, health and wellbeing, time management and school-life-work balance, respectful stewardship and space management, and well-rounded enrichment. The pedagogy of architecture and design is as complex as it is rewarding, and as dynamically evolving as the people who learn and teach it. This understanding resides at the core of the NJIT Learning and Teaching Culture Policy:

<https://design.njit.edu/learning-and-teaching-culture-policy>

COURSE EVALUATION CRITERIA

NJIT Undergraduate grading scale:

A 4.0 Superior

B+ 3.5 Excellent

B 3.0 Very Good

C+ 2.5 Good

C 2.0 Acceptable

D 1.0 Minimum

F 0.0 Inadequate

I Incomplete*

AUD Audit

W Withdrawal

S Satisfactory

U Unsatisfactor

* granted in rare instances to students who cannot complete the course due to unforeseen circumstances, must be approved by the instructor and administration.

ACADEMIC INTEGRITY

All students are expected to adhere to the University Code on Academic Integrity and to the Code of Student Conduct, as outlined: <https://www.njit.edu/dos/academic-integrity>

<https://www.njit.edu/dos/policies/conductcode/index.php>

GENERATIVE AI POLICY

Students should not utilize artificial intelligence (AI) tools towards the completion of coursework unless otherwise stated. Any assignments where the use of AI is permitted will be explicitly noted as such, and the AI must be cited following the NJIT Library AI citation guidelines. Please reach out with any concerns about the use of AI technology prior to submitting the assignment in question.