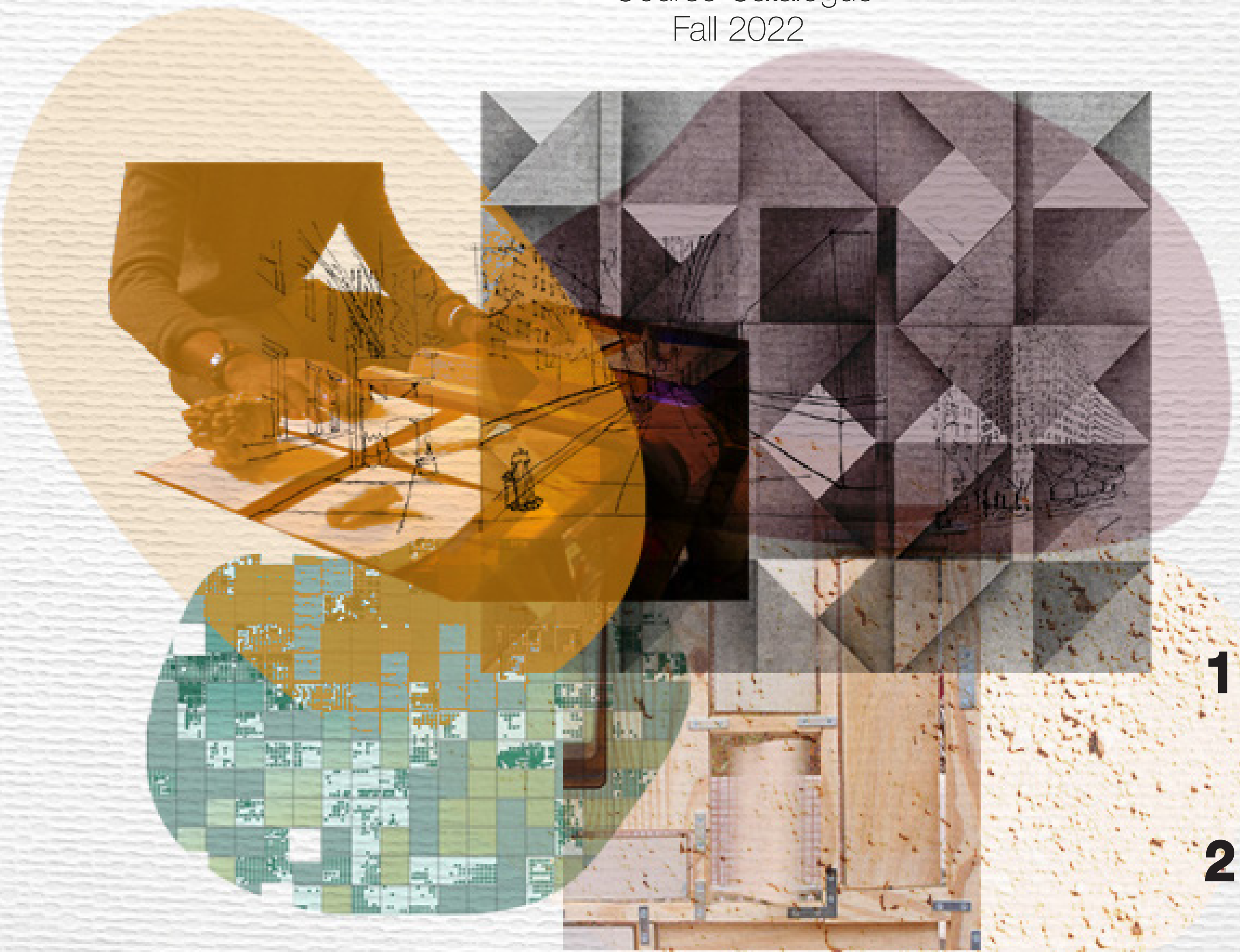
BUILDING TECH

TECHNOLOGY | ECOLOGY | CLIMATE | HEALTH

Course Catalogue
Fall 2022



Images from: Making Kin with Biomaterials, 1:1 Detailing & Fabrication, Transitional Geometries, TECH III

COLUMBIA
GSAPP

Lola Ben-Alon
Assistant Professor
Director, Building Tech

Building practices, even those supported by technology, are–like all human actions–necessarily contingent upon materials, social, and institutional arrangements, and are thus embodied, situated, and messy. Technologies themselves may condition design, and the lives of those who practice it and works behind the scenes for it. As David Benjamin writes in his editorial book “Embodied Energy and Design” (page 13), buildings are ideas made physical and they carry with them silent histories of the extractions, labor, and supply chains that are then manifested into an operational structure with dynamically moving parts. With emerging global challenges of social and environmental equity that arise from resource scarcity and public health emergencies, the Building Tech sequence takes a strong position to forward novel approaches to making buildings more resource-aware, comfortable (dare we say, pleasurable?), and available for all.

At the heart of this sequence are the required TECH I - TECH IV courses that take a new stance in threading technology, ecology, climate, and health considerations in existing buildings, integrating environmental, structural, mechanical, enclosure, and circulation systems through intense drawing and fabrication processes.

Additionally, an array of elective courses are curated as part of the sequence mission to create novel and radical experimental forms of building technologies, while celebrating the tactile interaction between humans, more-than-human species, materials, structures, and the built and natural environments. The Building Tech electives cover a range of topics, from landscape technologies and 1:1 fabrication of details, to healthy materials and supply chains of low-carbon and readily available assemblies. This course selection not only provides software tools for performance analysis and making practices, but also cultivates radical interventions to crafting new ways of understanding and imagining resource justice, anti-racist vernacular, construction slowness, recovery, and wellbeing.

With best wishes at the start of the semester,

Lola Ben-Alon
Assistant Professor
Director, TECH Sequence

Farm to Building
The Natural Materials Lab
Instructors: Tommy Schaperkotter, Lola Ben-Alon, Sami Akkach, Lorenz Kastner
Students: Zina Berrada, Fukunda Mbaru, Wenjing Xue, Shuyang Huang, Xiyu Li
Volunteers: Grace Schleck, Penmai Chongtoua, Lynnette Widder

COLUMBIA
GSAPP

Core Tech Sequence Overview

NO WAIVERS

**Core Tech Sequence - 18 Credit Hrs.
Required Classes:**

Tech 1-5 Required
Tech 6 Elective

YEAR 1		YEAR 2		YEAR 3	
Core I - Fall	Core II - Spring	Core III - Fall	ADV 4 - Spring	ADV 5 - Fall	ADV 6 - Spring
Tech 1 Environments In Architecture	Tech 2 Structures In Architecture	Tech 3 Materials And Envelopes			
		Tech 4 Integrated Building Systems	Tech 5 Integrated Construction Systems		
				Tech 6 Tech Elective (Option Any Semester)	

TECH 1 ADVANCED STANDING

You can be granted with Advanced Standing if you provice evidence of two relevant courses.

Tech 1 Advanced Standing gives you a 3 point credit.

YEAR 1		YEAR 2		YEAR 3	
Core I - Fall	Core II - Spring	Core III - Fall	ADV 4 - Spring	ADV 5 - Fall	ADV 6 - Spring
Tech 1 Environments In Architecture	Tech 2 Structures In Architecture	Tech 3 Materials And Envelopes			
AT1 WAIVER= 3 CREDITS		Tech 4 Integrated Building Systems	Tech 5 Integrated Construction Systems		
				Tech 6 Tech Elective (Option Any Semester)	

TECH 2-5 WAIVED

OPTION TO WAIVE ANY TECH COURSE (TECH 2-5)

You can be granted with a Waiver if you provice evidence of two relevant courses.

For each Waiver granted, you need a subsitute Tech Elective.

YEAR 1		YEAR 2		YEAR 3	
Core I - Fall	Core II - Spring	Core III - Fall	ADV 4 - Spring	ADV 5 - Fall	ADV 6 - Spring
Tech 1 Environments In Architecture	Tech 2 Structures In Architecture	Tech 3 Materials And Envelopes			
		Tech 4 Integrated Building Systems	Tech 5 Integrated Construction Systems		
Tech Elective 1	Tech Elective 2	Tech Elective 3	Tech Elective 4	Tech 6 Tech Elective (Option Any Semester)	

Building Tech Course Listings - Fall 2022

Clim. Equ. Des. Lo/Hi VS UD HP

Course	Title	Instructor	Climate & Energy	Equity & Health	Design/ Build	Low-Tech/ High-Tech	Visual Studies	Urban Design	Historic Preservation
A4111	**Tech I, Environments In Arch.**	Lola Ben Alon	●	●		●			
A4113	**Tech III, Materials & Assemblies**	Gaby Brainard & Tom Reiner	●	●					
A4114	**Tech IV, Building Systems**	Berardo Matalucci	●	●	●	●			
A4856	**Transitional Geometries**	Josh Jordan			●	●			
A6892	**1:1 Detailing & Fabrication**	Zachary Mulitauaopele			●	●			
A6917	**Seed Bombs**	Emily Bauer	●			●		●	
A4776	**Man, Machine, and the Industrial Landscape**	Sean Gallagher	●	●					
A4625	**Tensile/Compression Surfaces in Architecture**	Robert Marino			●	●			
A4634	**Advanced Curtain Wall**	Daniel Vos	●						
A4635	**Architectural Daylighting**	Davidson Norris	●	●					
A6893	**Making Kin With Biomaterials**	Chris Woebken	●	●	●	●			
A6894	**Net Zero Housing**	Andreas Benzing	●						
A4715	**Re-Thinking Bim**	Joe Brennan				●	●		
A6768	**Architectural Metals**	Richard Pieper	●			●			●
A6784	**Brick, Terra Cotta, & Stone**	Norman R. Weiss & Daniel Allen	●			●			●

Building Tech Course Listings - Fall 2022

EQUITY/HEALTH

TECH 3, Materials And Assemblies
Gaby Brainard & Tom Reiner

Making Kin With Biomaterials
Chris Woebken

Transitional Geometries
Josh Jordan

Man, Machine, And The Industrial Landscape
Sean Gallagher

TECH 4, Building Systems
Berardo Matalucci

1:1 Detailing & Fabrication
Zachary Mulitauaopele

Seed Bombs
Emily Bauer

Net Zero Housing
Andreas Benzing

TECH 1, Environments In Architecture
Lola Ben Alon

Tensile/Compression Surfaces In Architecture
Robert Marino

Re-Thinking BIM
Joe Brennan

Architectural Daylighting
Davidson Norris

Architectural Metals
Richard Pieper

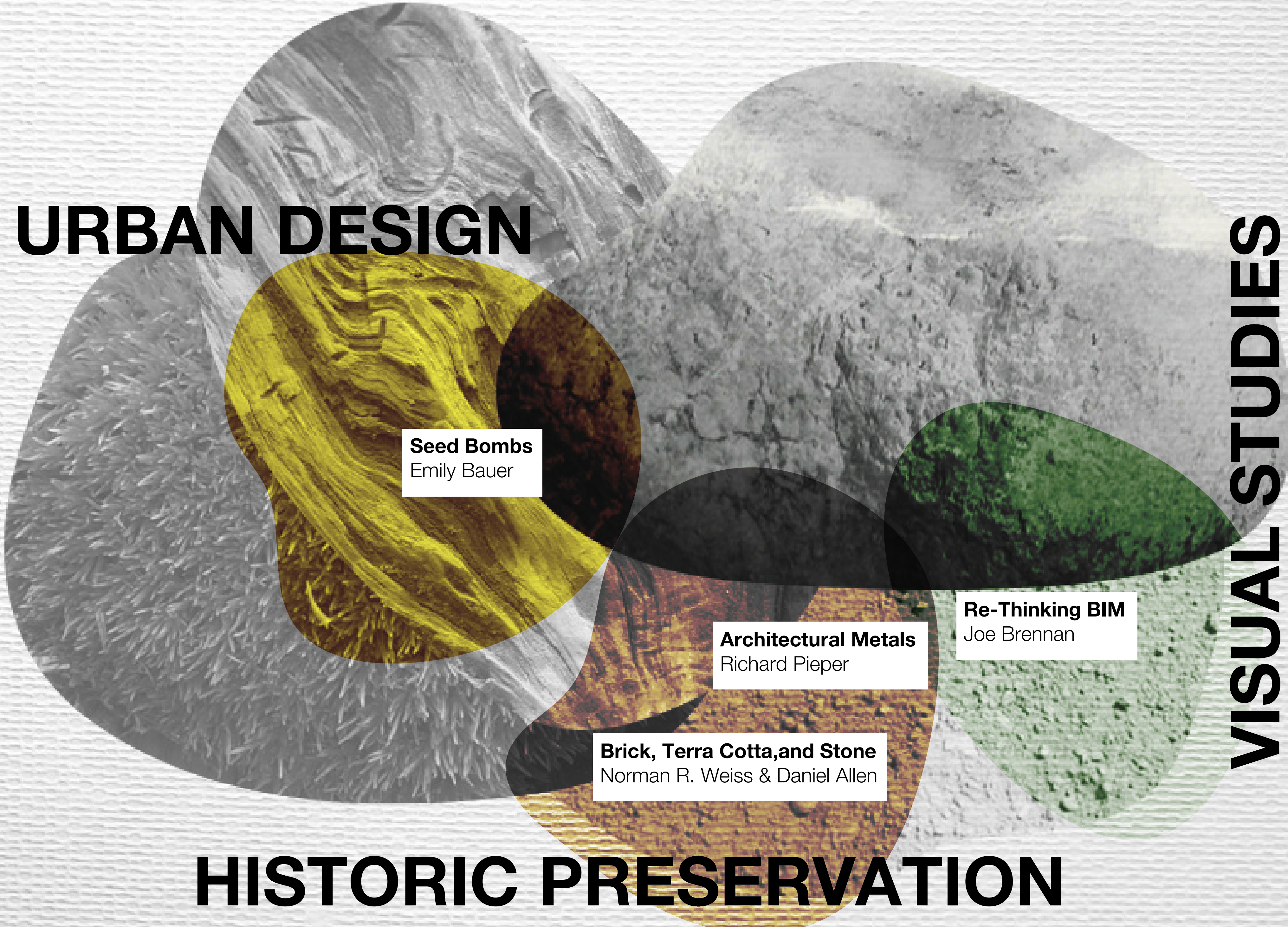
Advanced Curtain Wall
Daniel Vos

Brick, Terra Cotta,and Stone
Norman R. Weiss & Daniel Allen

CLIMATE/ENERGY

DESIGN/BUILD

HIGH-TECH/LOW-TECH


URBAN DESIGN
Seed Bombs
Emily Bauer
Architectural Metals
Richard Pieper
Re-Thinking BIM
Joe Brennan
Brick, Terra Cotta,and Stone
Norman R. Weiss & Daniel Allen
HISTORIC PRESERVATION
VISUAL STUDIES

Images from: Making Kin with Biomaterials, Tensile/Compression Surfaces, Net Zero Housing, Man, Machine, and the Industrial Landscape, Re-Thinking BIM

COLUMBIA

GSAPP

Building Tech

Fall 2022 Courses

TECH 1: ENVIRONMENTS IN ARCHITECTURE

Lola Ben Alon

Clim. Equ. Lo/Hi

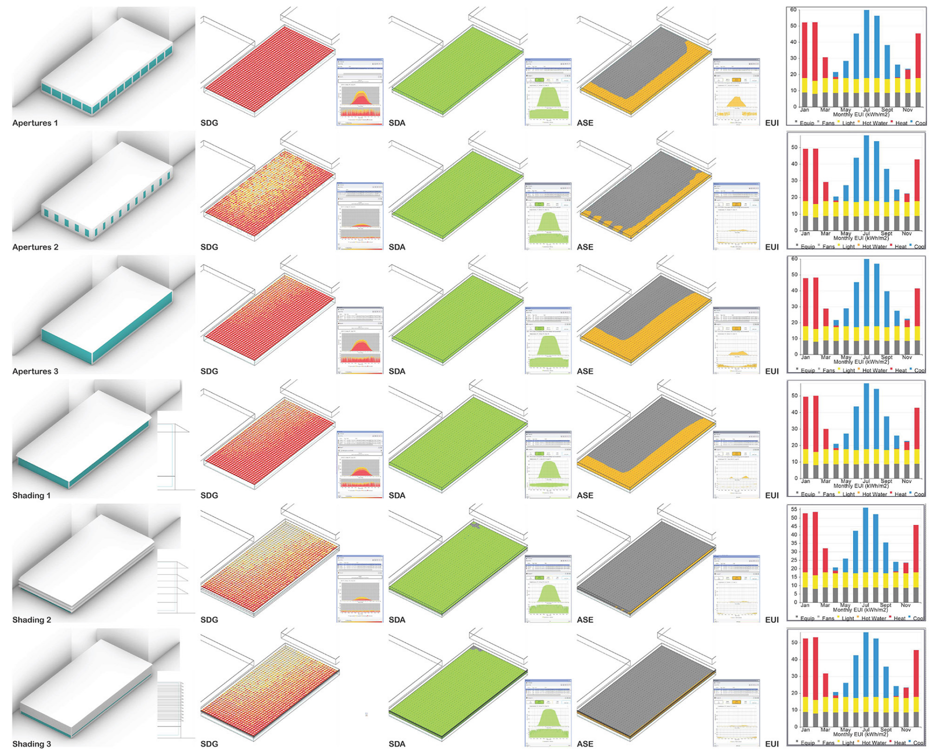
Student Work Samples
Gio Kim, Adam Fried, Ian Callender

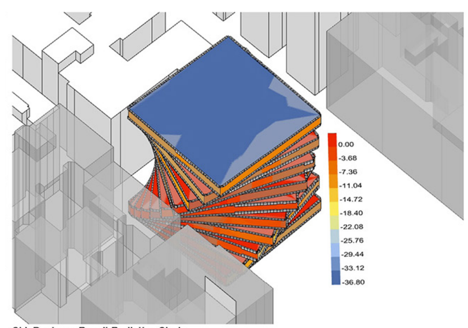
AT1 introduces building technology responses for energy conservation and natural conditioning, human comfort, and the site-specific dynamics of climate and environments. The state of the art in environmental design and passive heating and cooling technologies will be presented in lectures and supported by software tutorials, readings and assignments.

To illuminate the significance of architectural design decision-making on energy consumption and comfort, design specifications and modifications will be explored for a residential building. Students will be expected to integrate an understanding of the basic laws of comfort and heat flow with the variables of the local environment to create design adaptations for their own work. Homework assignments will be scaffolded to compile a professional environmental communication video, analyzing energy measures from massing, orientation, organization, enclosure detailing, opening control, to passive system integration and management.

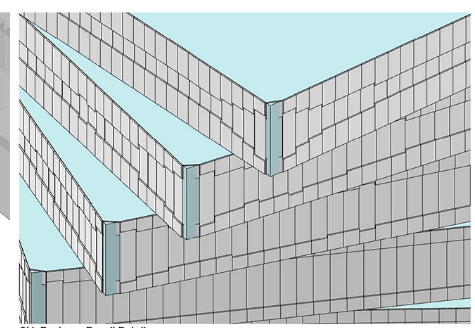
An overview of world energy consumption in buildings and energy rating systems will be introduced by lectures on building energy and emerging responsibilities for a broader definition of sustainability. The course will end with a critical and explorative visual communications exercise of environmental considerations that integrate natural and passive systems as well as the potentially dynamic interface of mechanical systems. Class time will be divided into lectures, lab introductions of software tools, and guest lectures. Students are encouraged to apply lessons learned in this class to their studio explorations.

A4111 | Tech 1: Environments In Architecture
Location: Avery 114
Date & Time: Tuesday 9 AM -12 PM
Call No.: 12425





SkinDesigner Result Radiation Study


SkinDesigner Result Detail

TECH 3: MATERIALS AND ASSEMBLIES

Gabrielle Brainard & Tom Reiner

Clim. Equ.

AT3: Materials and Assemblies introduces students to the technical design of structural and building envelope systems. The course is divided into two modules, each taught by a specialist in that subject.

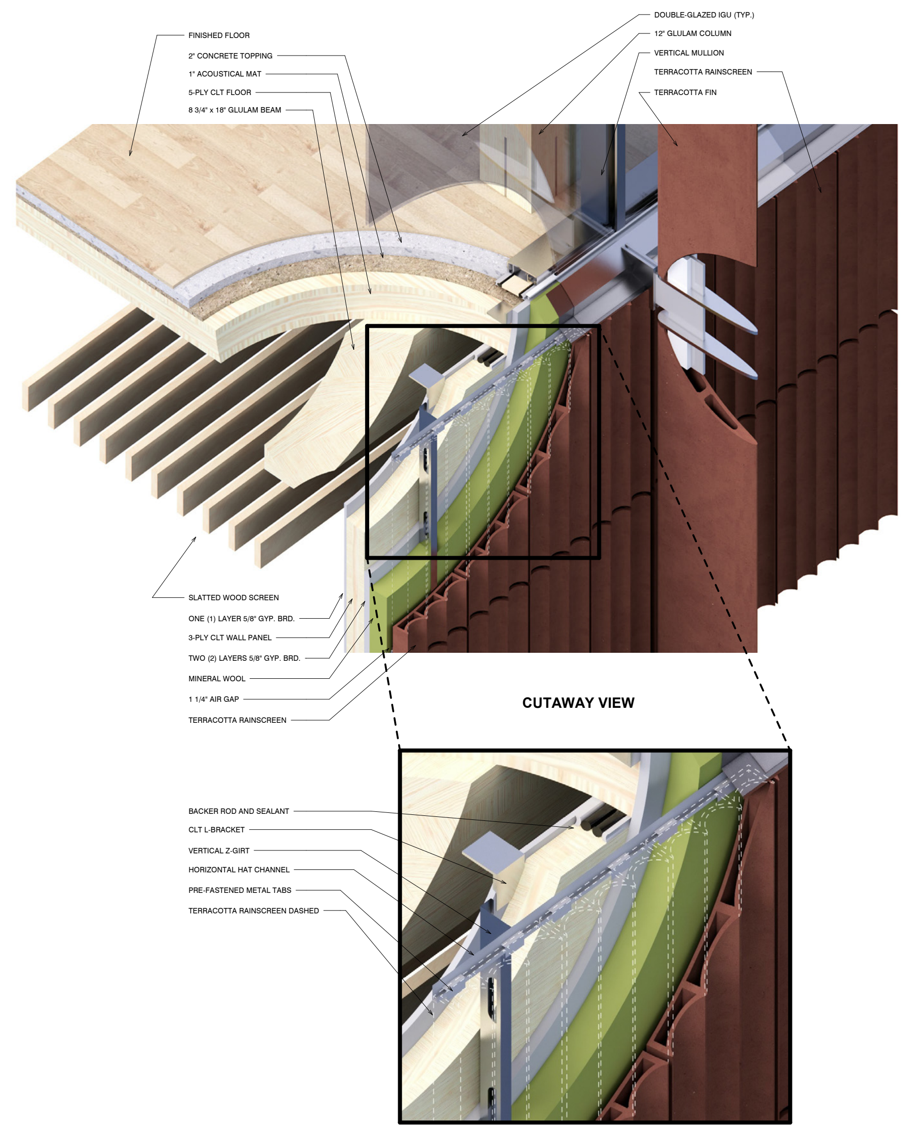
The first module focuses on structural systems and is taught by Thomas Reiner. The material is based on the structural concepts first introduced in AT2. This module covers structural design criteria, building structural design, and discusses common structural systems and materials. The students learn how to develop and detail preliminary designs of structural systems based on the strength and properties of different materials, as well as the geometry of their building designs.

The second module focuses on building envelopes and is taught by Gabrielle Brainard. Beginning with envelope design principals and system typologies, and moving on to performance criteria, documentation strategies, and considerations of project execution (fabrication, installation, cost), this module covers the tools and methods of façade design and prepares students to design advanced enclosure systems. The course is taught in lecture format. The lectures cover core concepts relevant to the design process of both structural and envelope systems. A series of group8-based design and detailing exercises encourage students to immediately engage with the material presented during class and develop a hands-on understanding of the principles and systems discussed.

AT3 is taught in parallel with AT4 – Building Systems. Students are expected to apply the material covered in AT3 to the structural and envelope design of their AT4 projects.

A4113 | Tech 3: Materials & Assemblies
Location: Avery 114
Date & Time: Thursday 9 AM -12 PM
Call No.: 12420

Student Work Samples
Thiago Lee, Blake Kem, Khadija Tarver, Stephen Zimmerer, Aaron Smolar



TECH 4: BUILDING SYSTEMS INTEGRATION

Berardo Matalucci

Clim. Equ. Des. Lo/Hi

Student Work Samples
Hanyu Liu, Kaixi Tu, Dongxiao Yang, Ruisheng Yang, Zixiao Zhu

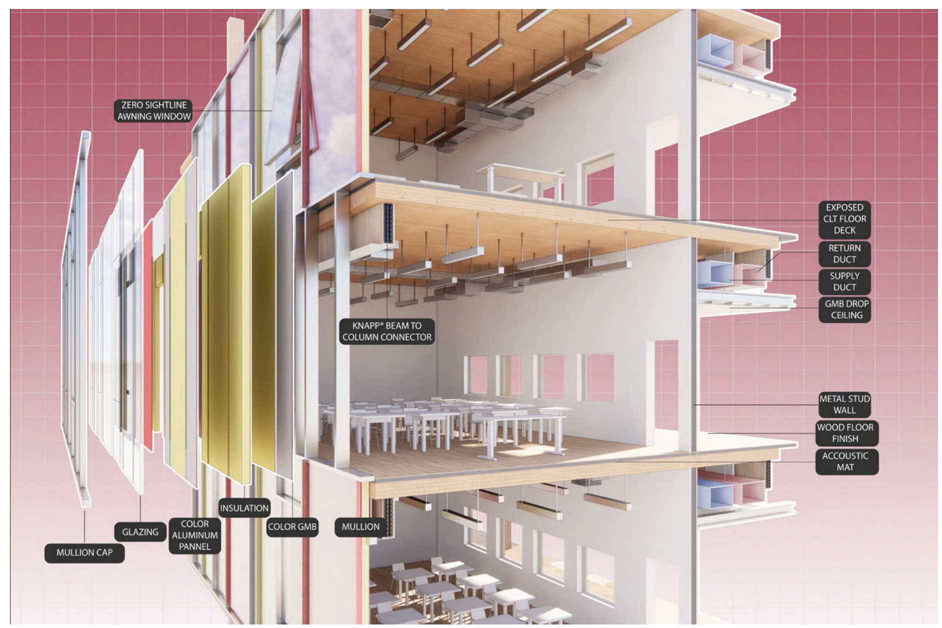
Building Systems Integration (Tech 4) brings together the technical domains of life safety, fire protection, environmental systems, structure, and enclosures in a way that promotes the integration of disciplines. It also exposes participants to the issue of validating their design ideas against code and technical constraints. The knowledge, concepts, and principles learned in previous Tech courses are applied in a design-based project.

The construction of a building is essentially a part-to-whole problem, as it involves the integration of multiple building components, systems, and processes into a whole. In successful building projects, architects, engineers, fabricators, and erectors work together to develop each respective part. Within this process, architects hold a critical role in ensuring the successful synthesis of these multiple parts, all while keeping the design intention intact. Through a better understanding of the different building systems and the constraints associated with them, architects can integrate systems more completely with greater economy, elegance, and efficiency. A well-integrated building is an efficient one, an elegant one, and most importantly, a well-integrated building gets built.

The intent of the course is an intensive introduction to the application of technical systems through design development. The course objectives are to establish an understanding of the technical aspects of architecture and how they participate in reinforcing and supporting the design intentions, such as beauty, sustainability, functionality, and integration with the surroundings. Structural form, environmental systems, materials, construction methods, and fire protection elements are developed systematically and integrated.

This course takes a fresh look at the primary systems within a building. What are their key drivers, requirements, and intentions around each system? What are techniques to rapidly iterate around design ideas and strategies? The course is structured in two modules: a series of lectures on technical topics and assignments to encourage real-case applications. The participants will work in teams, selecting a design concept previously developed during the previous studio. The design teams will work with mentors to bring the chosen design concept to a highly-detailed level of development by constantly confronting the design intent against the technical constraints discussed in class and nurturing a critical decision-making process.

A4114 | Tech 4: Building Systems Integration
Location: Avery 114
Date & Time: Tuesday 2PM - 5PM
Call No.: 12425



TRANSITIONAL GEOMETRIES

Josh Jordan

Des. Lo/Hi

This course investigates tiling and modular fabrications, from two simultaneous motivations:

1) To explore the organizational, experiential, and aesthetic performance of units and repetition in architectural composition. This trajectory of the course will consider the history and application of tiling effects and techniques in the making of architecture, as well as study the geometric principles that lead to existing and potentially new systems of connections of parts.

2) To develop the skill sets involved fabricating the units: through mold-making, casting substances, and other shop-based materials and methods. This trajectory of the course will look at moldmaking craft as an analog to construction logics writ large, efficiencies and economies of modular fabrication, and the development of fabrication systems that apply the lessons of the first trajectory in new and innovative ways.

This course will begin with exercises in tiling, tessellation, and pattern, developing incrementally into a 3D modular geometric system. These systems will be constructed physically along with digital development.

Note that the materials component of the course will have individual student costs in the range $200-250.

A4856| Transitional Geometries
Location: Ware Lounge
Date & Time: Wednesday 9AM -11AM
Call No.: 12445

1:1 DETAILING + FABRICATION

Zachary Mulitauaopele

Des. Lo/Hi

As digital fabrication processes continue to advance, our comprehension and command of these construction methodologies is critical in capturing the full potential they offer to the built environment and how we design. 1:1 will focus on advanced detailing, fabrication, and assembly techniques. We will challenge the conventional illustrative mode of architectural detailing by using 1:1 material exploration to facilitate design ideation and spatial speculation. The course encourages curious fabrication, rogue detailing and imaginative research into new potentials for building assemblies.

Participants will iteratively build a totem, a remixed and on the fly response to the default wall mock-up. Shifting through scales of a building, we will track the spatial and technical trajectory of detailing custom hardware, new wall typologies, structural abnormalities and fully customized building skins. The course will oscillate between detailing and fabricating these spatial constructs, always building off of the previous week's iteration to facilitate new and unimagined component adjacencies. The totem, which should be thought of as a living prototype, should fill a 2'x2'x5' volume.

A6892 | 1:1 Detailing + Fabrication
Location: Buell 200
Date & Time: Tuesday 7PM - 9PM
Call No.: 12452

SEED BOMBS: URBAN ECOLOGIES AND LANDSCAPE TECHNOLOGIES

Image Credits
eCOncreteTECH, Balmori Associates, Bouyant Ecologies Float Lab

Emily Bauer

Clim. Lo/Hi UD

Ecosystems have a larger role than ever to play in our buildings and cities and are a key to future adaptation. Seed Bombs: Urban Ecologies and Landscape Technologies will explore the realms of ecosystems in the urban environment and the technologies and systems that they depend on and support. In this course, constructed and emergent ecosystems are considered across scales, from architectural to urban scale and lessons are applied through a fabricated installation.

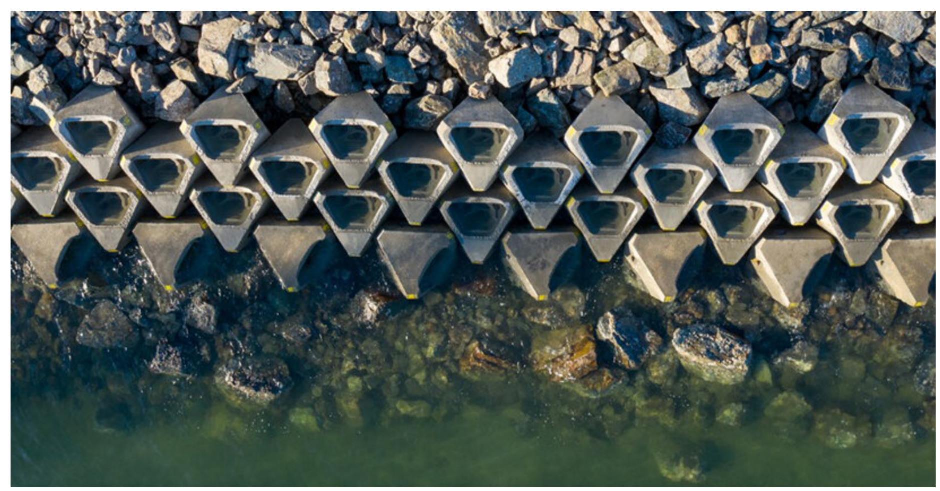
As a significant component of contemporary design, landscape's key concepts, diverse characteristics, metrics and modes of measurement, and cutting-edge practices will be explored through lectures, readings, and case studies. Students will be expected to articulate an understanding of these topics through assignments, discussions, case studies, and their final project.

Floating landscape typologies have the potential to produce measurable impacts on water quality, native ecology, and community wellbeing, as well as serve as an important design reference in the city. Through the course, students will fabricate a cultivated/constructed intervention that functions as a floating marine landscape. The course will end with students constructed projects being installed on NYC's Red Hook waterfront. The intervention's ongoing ecological performance will be monitored in collaboration with the local RETI Center nonprofit.

Class time will be composed of presentations, guest lectures, discussions on key topics, peer-presentations of case study best practices, and design/fabrication reviews.

Our urban environments are adjusting the idea of nature to include technology-dependent and emergent ecosystems. The course will provide the tools to understand, assess, and build these hybridized ecological systems.

A6917 | Seed Bombs: Urban Ecologies And Landscape Technologies
Location: Avery 409
Date & Time: Wednesday 9AM - 1PM
Call No.: 13210
Cross Registered with Urban Design



MAN, MACHINE AND THE INDUSTRIAL LANDSCAPE

Sean Gallagher

Clim. Equ.

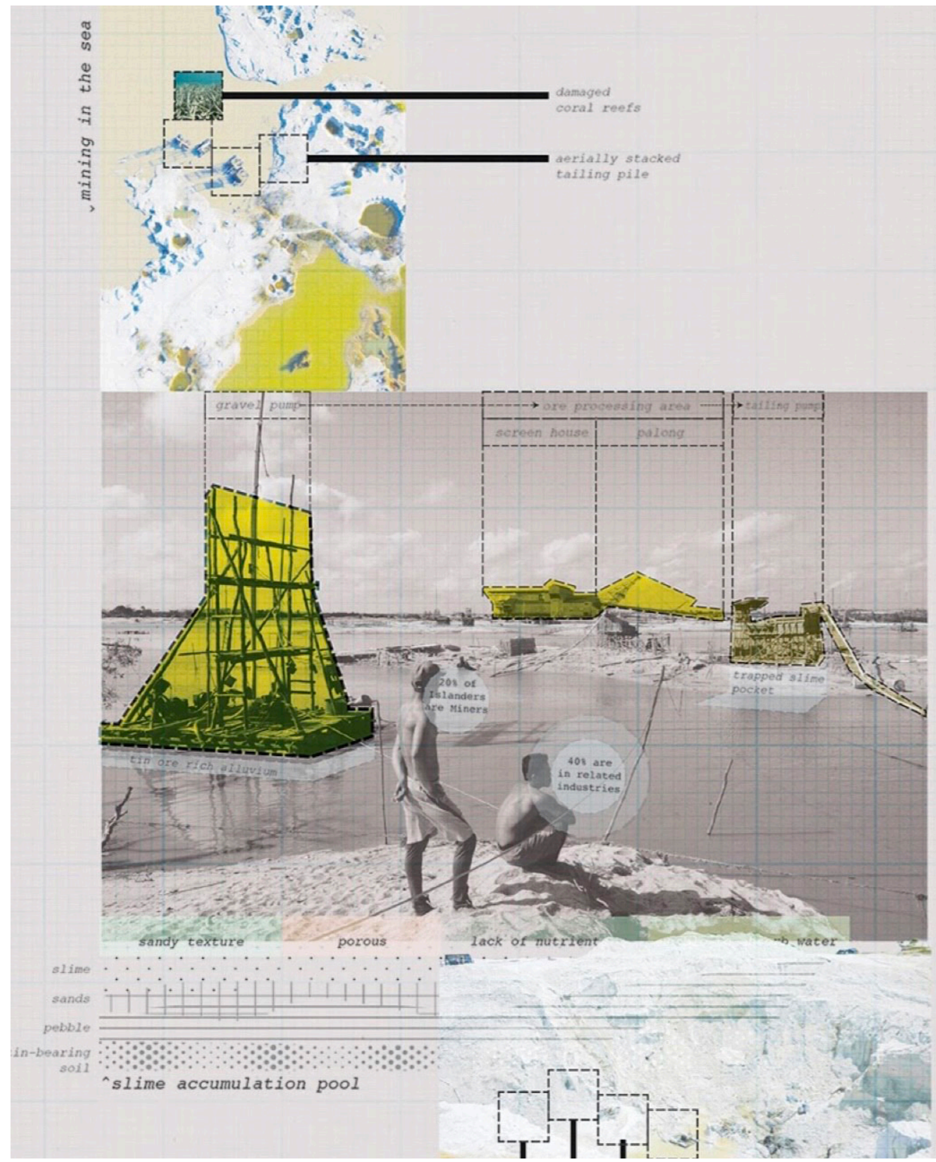
Industrialism changed human civilization and the surface of the Earth in unimaginable ways. While it has exponentially increased human awareness and prosperity, its has initiated the Earth's 6th Great Extinction Era. It's both promising and terrifying. So what is next? That is unclear. But one thing is for certain, a transformed Industrial ecosystem will need to be at the center of any solution where human civilization as we understand it today survives this mass extinction event.

In light of this reality, this course examines past, present and future strategies of meeting the growing industrial and infrastructural demands of human civilization. The goal is to expose students to emerging post-industrial relationships between people, industry, and ecology that have the potential to define how human
civilization can thrive globally within the planet's biospheric constraints.

Through lectures, field explorations, and self-directed research, each student will gain a broad understanding of the means and methods that industrialized communities use to support societal needs. During the semester, the class will visit both industrial and post industrial sites of material extraction, refinement, production, distribution, and sequestration.

Students produce writings and drawings analyzing and re-imagining the potential futures of global community structures and networks. The course is structured as a think-tank and students are encouraged to use their personal interests to identify unlikely post-industrial relationships between community, environment, and industry. On a broader level, this course is designed to be a means for each student to develop a personal manifesto for how urban planners and architects can influence the necessary change in how we structure global habitation.

A6892 | Man, Machine, and the Industrial Landscape: Re-Imaging the Relationship Between Industrial and Public Territories
Location: Avery 409
Date & Time: Monday 9AM - 11AM
Call No.: 12445



TENSILE/ COMPRESSION SURFACES IN ARCHITECTURE

Robert Marino

Des. Lo/Hi

Student Work Samples
Nelson DeJesus

In the history of architecture there are few forms which engender thoughts of the Platonic Ideal. We think of the perfect architectural form: a combination of an efficient use of a material and labor at hand, an intelligent encapsulation of space for a particular use, and a structurally precise concept. In the past these goals have been met by architects, engineers, and designers of a particular ilk. Our current ability, (or inability), to deal with our physical environments could benefit from an appreciation of this type of design. There is no better summary of this way of working than in understanding shells.

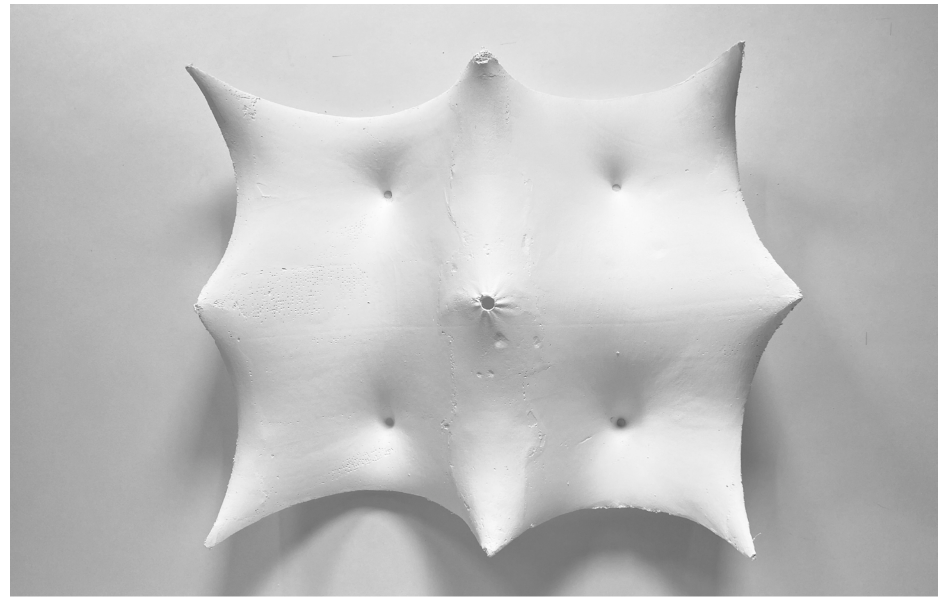
The course is organized with a brief weekly visual presentation by the instructor, an invited architect, or when possible, a field visit, conducted by the instructor or a qualified specialist. The themes for these presentations are aligned with the production of architectural shells in both the history of architecture, and as pure, theoretical physical/structural constructions. The remainder of the allotted class time will be devoted to a discussion of each student's work on their chosen semester projects.

The semester project will be the construction of a shell, and the consideration of its theoretical form, the techniques of its fabrication, and the materials of its construction. These assumptions will be proposed by the student(s) and will become their responsibility. The use of the GSAPP Maker Space or shop will be necessary and encouraged. It will be possible for students to work individually, or in teams.

Presentations to the class, as well as the student's own work will be aligned with physical principles active in shell construction and theory. The principles can be described through an active glossary of terms, which will be emphasized throughout the semester.

In addition to visual presentations, there will be two visits to the Avery Archives, to examine the work of Santiago Calatrava and Rafael Guastavino. A field trip is being planned to see the plywood shell structures of architect George Nakashima in New Hope, Pennsylvania.

A4625 | Tensile/Compression Surfaces in Architecture
Location: Avery 115
Date & Time: Thursday 7PM-9PM
Call No.: 12428



ADVANCED CURTAIN WALL

Daniel Vos

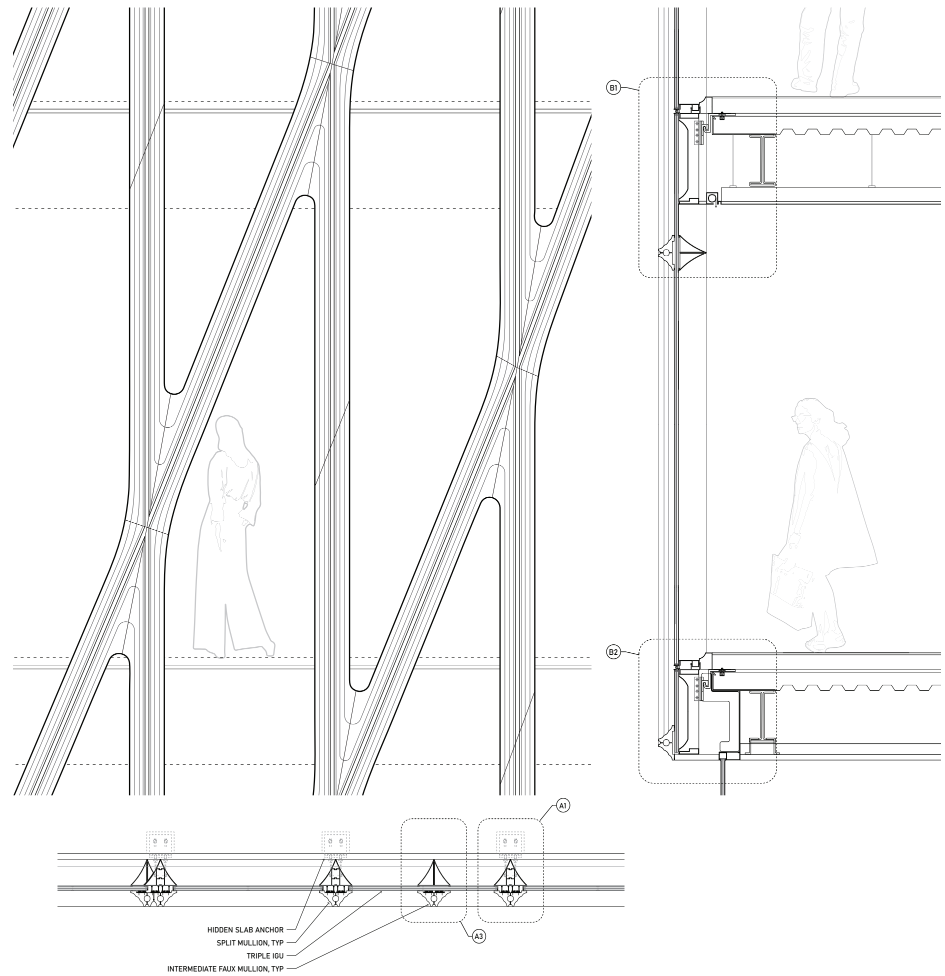
Clim.

This course is intended for students wanting to focus and excel in the technical execution of custom curtain wall enclosures. It will provide students with a comprehensive understanding of the concepts, process, and skills necessary to design, detail, specify, and administer the construction of a custom curtain wall. The course will be structured with a dual seminar / studio format. Lectures for the seminar portion will inform the studio design project and vice versa.

The primary focus of the course is the intensive, semester-long Technical Studio Design Project. Students will design their own unique custom curtain wall, developing detail drawings and preparing outline specifications. The projects will be developed over the course of the semester through Mini-Pinups that encourage peer-to-peer feedback, weekly individual crits with Prof. Vos, a mid-term pinup review, and a final end-of-semester pinup review.

The Seminar Lectures will introduce key concepts to understand the first-principles of façade enclosure design and key performance features of unitized curtain wall systems. The lectures will further explore the many material and aesthetic possibilities of curtain walls, explain design documentation methods and strategies, and review the various phases of the process through which custom curtain walls are designed, engineered, and built. This will include discussions on contract documentation, forms of contract, the bid process, review of fabricator's submittals and shop drawings, full-scale performance prototype testing, and fabrication and installation processes. Case study examples will be used throughout the lectures to show real-world examples of the concepts presented.

A4634 | Advanced Curtain Wall
Location: Avery 115
Date & Time: Tuesday 11AM-1PM
Call No.: 12431



ARCHITECTURAL DAYLIGHTING

Davidson Norris

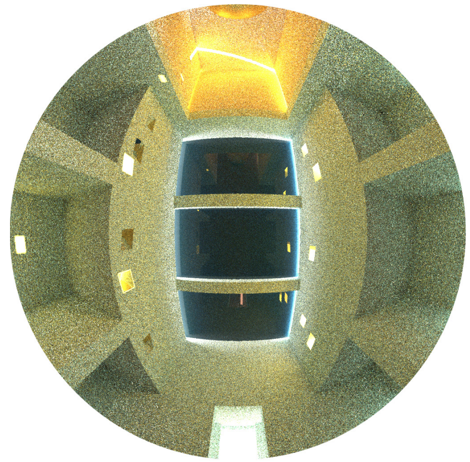
Clim. Lo/Hi

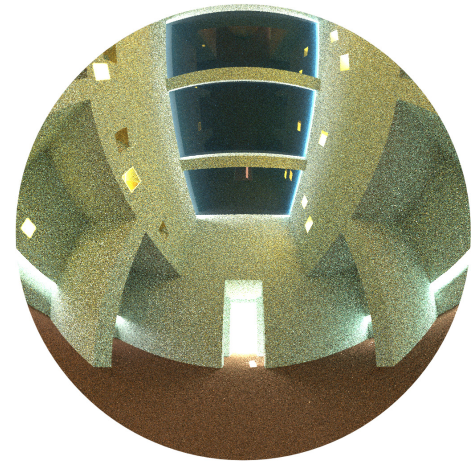
"Natural light is the only light that makes architecture Architecture..." - Louis Kahn

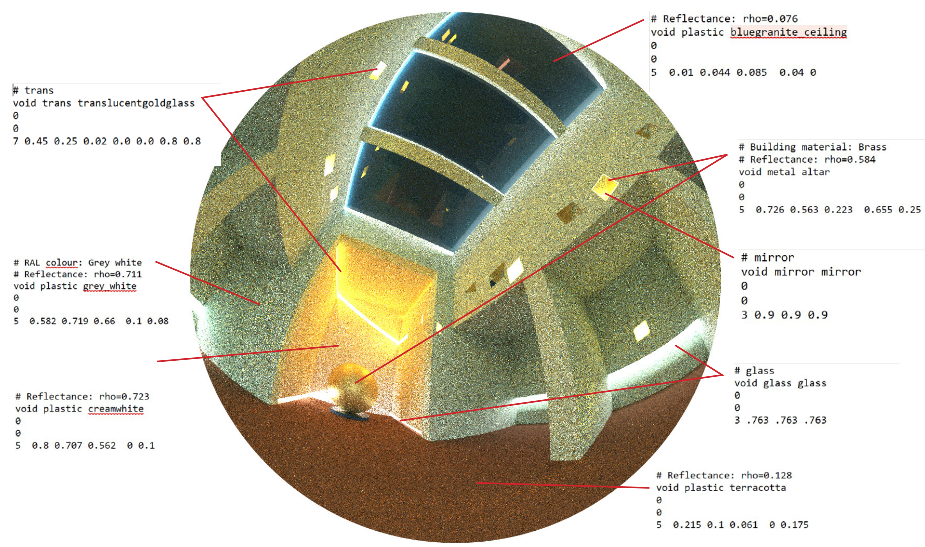
Daylight has played a key role in the perception, aesthetics and function of the built environment from its inception. The masterful play of light depends on the designer's grasp of both the technical requirements and spatial opportunities of natural light. This course will provide instruction in both.

Topics covered include: daylight and health, energy and productivity; daylight and perception; daylight in the atmosphere; daylight and the site; daylight and the section; architectural shading; calculating the daylight factor graphically; calculating daylight luminance and illuminance digitally using Rhino/Diva. Over the course of the semester, related assignments will develop perceptual as well as technical daylighting acuities. At the end of the semester, students will build physical models and put them out in the sun to test and demonstrate an architectural daylighting phenomenon of their choosing located, preferably, in their studio project.

A4635 | Architectural Daylighting
Location: Avery 412
Date & Time: Thursday 11 AM - 1 PM
Call No.: 12439







MAKING KIN WITH BIOMATERIALS

Chris Woebken

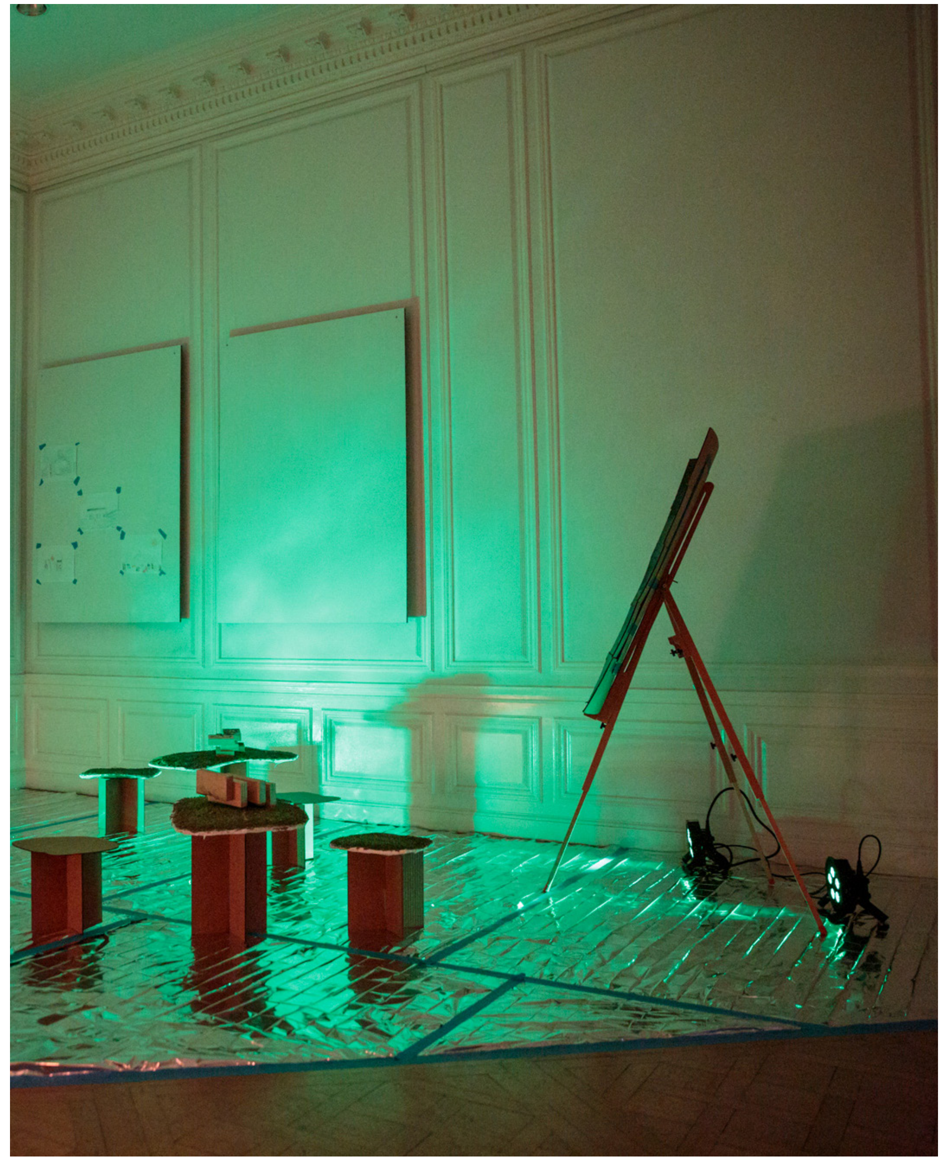
Clim. Equ. Des. Lo/Hi

Student Work Samples
Yingjie Liu, Brianna Love, Gloria Mah, Tashania Akemah, Carmen Yu

The realm of the tiny and invisible has actively been ignored within modern societies, despite or exactly because modern science found out more and more about our mutual relations and dependencies with microorganisms, fungi, and other non-human species. Only recently, this situation has started to change. New scientific, computational, philosophical, and evolutionary approaches emphasize the decisive role of the microbiome in the development and maintenance of complex life-forms. In the pyramid of organic life, microorganisms not only lay the foundation but by far represent the largest part, both in numbers and in volume or weight.

With the dawning of the carbon-based period of modernity and the realization of the environmental costs that are going along with it, biological agents and materials have received a major upgrade in public recognition. Being it for substitution of carbon-based building materials or fuels, being it as a means to clean up the petromodern mess, or being it as the basis for entirely new regimes of nutrition, transport, and living, nowadays' future scenarios are full of visions for newly envisioned uses of or, rather, collaborations with microorganisms.
This course aims to theoretically and practically investigate and reveal these mutual relationships and multispecies collaborations across all scales. Students will interrogate different approaches of industrial production, conceptualize and materialize objects that propose alternative approaches and situate these artifacts within the speculative frameworks and future developments. We will be designing prototypes for interfacing with biological systems in the form of grown materials, bioreactors, sampling instruments, or bio-receptive substrates. Students will have the chance to present work-in-progress prototypes and scenarios in a public forum at the project space 1014 within the framework of a series of workshops to embody and imagine life in a post-carbon society.

A6893 | Making Kin With Biomaterials
Location: Avery 408
Date & Time: Tuesday 4PM -6PM
Call No.: 12454



NET ZERO HOUSING - A MACHINE WITH A POETIC BIAS

Student Work Samples
Hao Ma

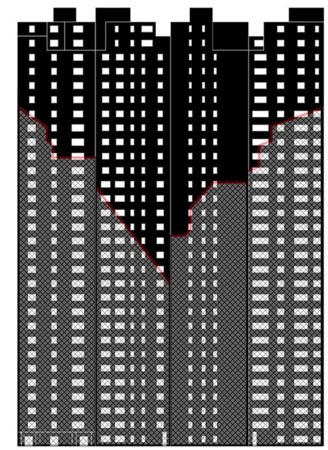
Andreas Benzing

Clim.

Net Zero Housing - A Machine with a Poetic Bias introduces building science principles to the tectonic treatment of massing an existing residential building in New York City. The course will explore the physical built environment: how the performance factor “energy balance” is influenced by climate conditions, spectral and thermal properties of materials, and the human body. The course will introduce tectonic principles as a possibility to express the thermal characteristics of the building skin and relate them back to the human body. This approach to building performance will explore form and geometry, mass and void, light and shadow, art form, and core form. The lectures and exercises are organized and paced to provoke questions to search for solutions in a methodical and morphological approach as they relate to the performance of a building.

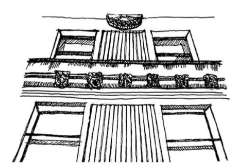
A6894 | Net Zero Housing
Location: Avery 409
Date & Time: Tuesday 5PM -7PM
Call No.: 12457

AXONOMETRIC DRAWING

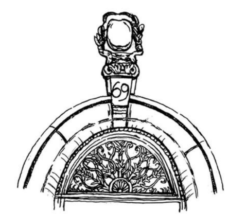


EXPLORATION 03

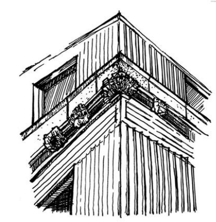
Glazing to Wall Ratio: East Elevation: 18.8% North Elevation: 23.2% West Elevation: 11.4% South Elevation: 41.8%



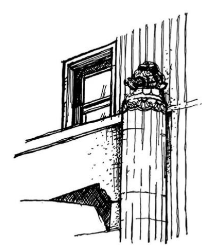
Cornice Drawing



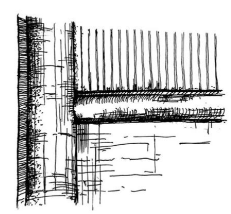
Cornice Drawing



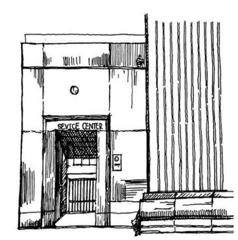
Corner Drawing



Joint Drawing



Joint Drawing



Joint Drawing

RE-THINKING BIM

Student Work Samples
Gejin Zhu and Bingyu Xia

Joe Brennan

Lo/Hi VS

Different assumptions exist for BIM, which stands for Building Information Modeling. Most people will tell you it means Revit. Others equate it more closely with parametric design.

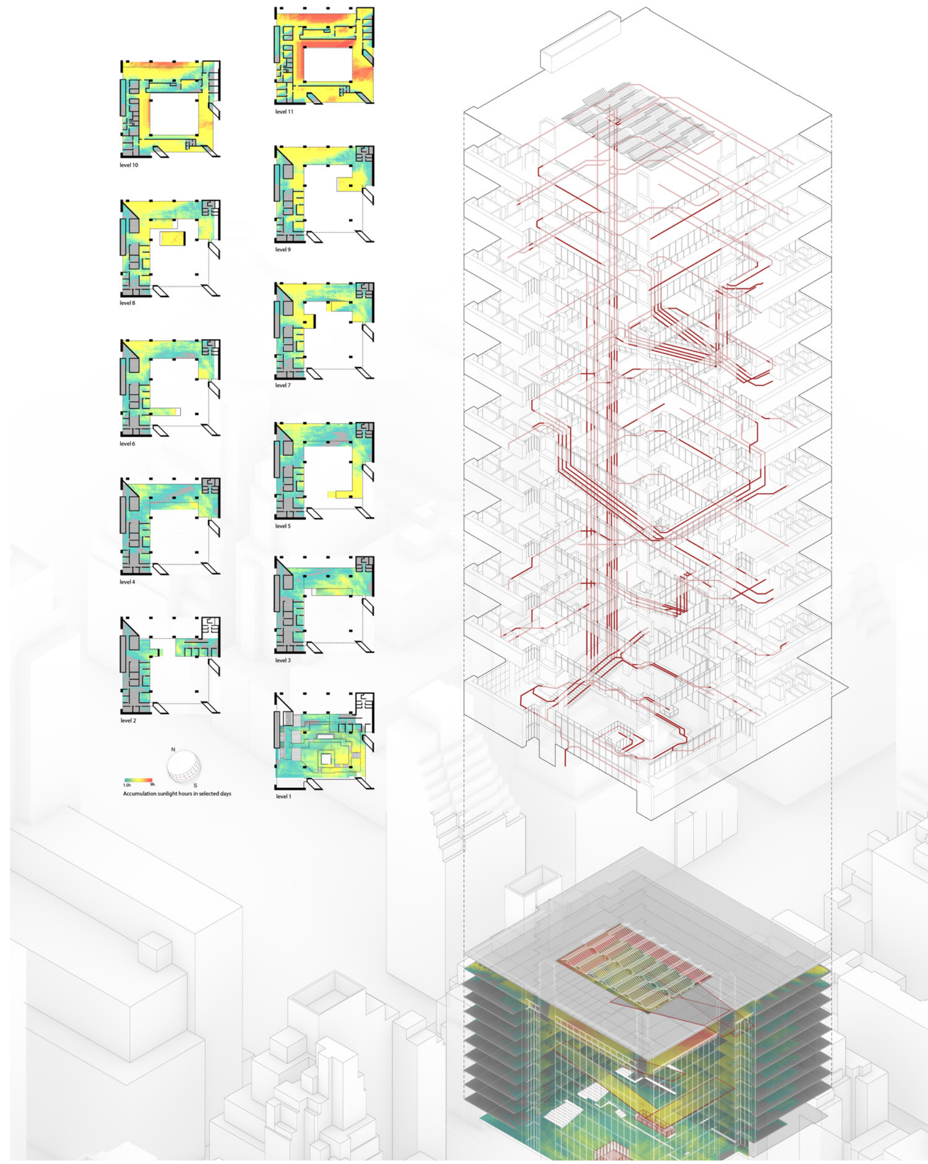
Rethinking BIM will challenge its participants to explore different methods of leveraging BIM to enhance all processes within our industry.

One of the critical drivers of success within architecture is our ability to collaborate with other members of the development, architecture, engineering, and construction (DAEC) industry. We will therefore examine how these related disciplines function. Concurrently, we will develop processes by which we can understand and communicate with them better, more efficiently, and seamlessly. We will also take inspiration from outside of the DAEC industry in areas like tech and manufacturing. Finally, we will leverage drawing and diagramming to visualize and explain these collaborative processes.

Throughout the semester, your project and thinking must function at two scales - macro (urban scale or building scale) and micro (program scale or detail scale). The goal of the class is to leverage new BIM processes to drive better-informed design, so all projects must develop a process that leads to a concrete design idea. You will be required to present both process and design ideas through various assignments throughout the semester. Students will work in groups.

The class will consist of lectures, discussions, pin-ups, office hours, and workshops. Lectures will consist of presentations and case studies. The lectures will consist also consist of software demonstrations. Class time together will focus on “big ideas” and concepts critical to successful project execution.

A4715 | Re-Thinking BIM
Location: Ware Lounge
Date & Time: Thursday 7PM -9PM
Call No.: 12387
Cross Registered with Visual Studies



ARCHITECTURAL METALS

Richard Pieper

Clim. Lo/Hi HP

New York is a city of masonry and metals. Its architecture reflects the changes in metal use and manufacture of the past three centuries, and provides an extraordinary laboratory for their study. What is the difference between wrought iron, cast iron, and steel? When were they introduced, how do they deteriorate, how can you visually differentiate them, and how can they be restored? Is that statue lead or zinc? What are the treatment needs of each? How can that copper cornice be replicated or restored? Is that ornament stamped, cast, or brake-formed, and what are the options for restoration? When were nickel silver and monel introduced, and how do they weather? What did that 1930's aluminum look like when it was first installed? How can that appearance be replicated?

With lectures and field trips this seminar reviews the structural and decorative uses of metals in buildings and monuments from the eighteenth to the twentieth centuries. The metals to be reviewed include wrought iron, cast iron, and steel; copper and copper alloys including bronze and brass; lead; tin; zinc; aluminum; and nickel and chromium alloys. Assuming that Columbia will once again allow us to bus together to Perth Amboy, NJ, we will pay a visit to V&S Hot Dip Galvanizing (pictured above) to watch steel being dipped into 600,000 pound vats of molten zinc. With visits to some of the City's most remarkable structures, the course will examine the history of metal manufacture and use; mechanisms of deterioration and corrosion; and cleaning, repair, and conservation.

A6768 | Architectural Metals
Location: 655 Schermerhorn Extension
Date & Time: Wednesday 2PM-5PM,
Sep. 7 - Oct 12
Call No.: 12499
Cross Registered with Historic Preservation

Photographs from Field Trips

BRICK, TERRA COTTA & STONE

Norman R. Weiss & Daniel Allen

Clim. Lo/Hi HP

This course explores a complex group of traditional masonry materials--brick, terra cotta and stone.
Our format includes lectures, demonstrations and laboratory exercises, and a field trip. The goals of the course are to provide:

1) An historical overview of the manufacturing and sourcing of these architectural materials with a focus on the 18th century to the present;

2) An understanding of some fundamental material properties in relation to their use and deterioration in a range of masonry construction systems; and 3) an exploration of state-of-the-art means and methods of their repair, maintenance, and conservation.

A6784 | Brick, Terra Cotta, & Stone
Location: 655 Schermerhorn Extension
Date & Time: Wednesday 1PM-5PM, Starting Oct 19th
Call No.: 12500
Cross Registered with Historic Preservation