Type of Course: Advanced Studio ARCH 51000 / ARCH 85101 / ARCH 91102
Class Meetings: M/TH 2:00PM – 5:50PM; Thursday lectures @ 5:30 PM
Instructor: Professor Ahu Aydogan, aaydogan@ccny.cuny.edu
Location: Spitzer 325
Semester/Year Fall 2019

Weaving the Double Skin: Double W's

Hybrid Webs: Tomas Saracena
© Photography by Andrea Rossetti

Studio Overview:

To develop next generation building systems for sustainable environments, interdisciplinary knowledge across different scales needs to be performed. Design thinking has to be expanded to include broad range of disciplines and scales. Architectural design is a balance between technical, scientific and artistic values. How and what we think during design process is influenced by the knowledge we gain through science, engineering and art works that conceive ecology.

This studio will explore different scales in design. Two different studio topics will be explored as *building integrated systems* with the transformation in science and technology. While these two topics designed in selected building type, the emphasis shouldn't be limited only by energy saving. Two projects are: spider webs and vertical weed for shading. The building we will use for these two integrated systems is Turk Telekom Headquarters, Ankara/Turkey. Double skin façade will be the design zone for the integrated ideas. Students will work in groups of two.

a. Spider Webs:
"Spiders, we now understand, have given us a model of which the present is a simulacrum, though not just the technocratic, seemingly intangible future-present of life online but also the real-world urgency of environmental relationships and their fragility."
(David Toop, *Filament Drums: the Endless Instrument*, in <u>Cosmic Jive: The spider Sessions</u>, 2014)

Tomas Saraceno, an artist working with large-scale, interactive installations and floating sculptures, made us aware of three-dimensional form geometry of spider webs. His studies have opened our eyes in the direction of comparative studies in mathematics, engineering, arachnology, art and architecture. In this studio, from an architecture point of view, spiders will be used to create webs to form organic shading elements in the double skin façade to save energy by shading the facade. This project is not biomimicry, designing artificial webs by observing spiders, it is making spiders work in the direction of the simulation analysis of the environmental parameters. During the development of the design, quantitative and qualitative solar radiation, shading and natural ventilation, lighting, illumination strategies will be examined through the given case study.


Hybrid Webs: Tomas Saracena
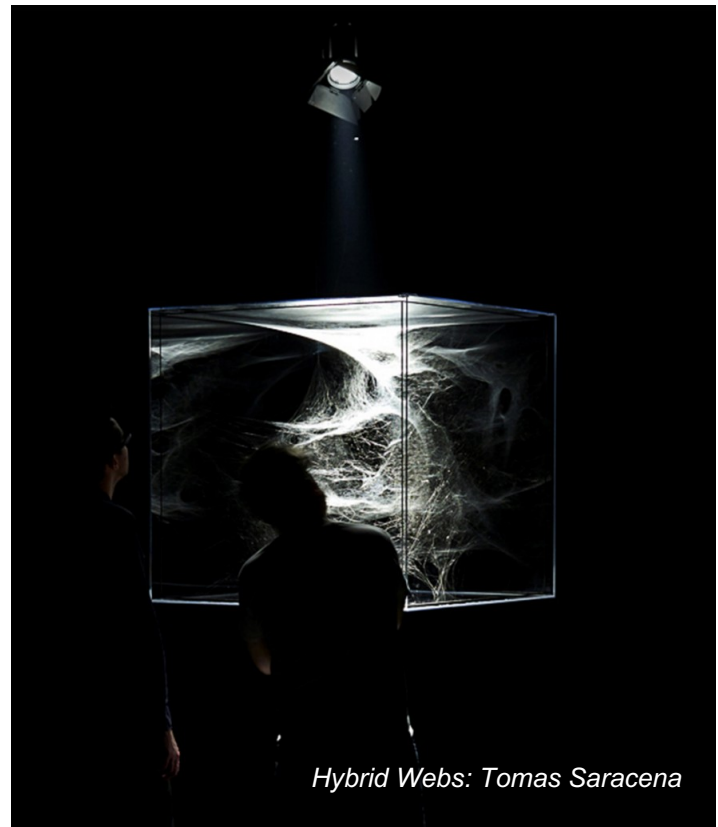
b. *Vertical Weed:*

"Cannabis is remarkably safe. Although not harmless, it is surely less toxic than most of the conventional medicines it could replace if it were legally available. Despite its use by millions of people over thousands of years, cannabis has never caused an overdose death."

(Lester Grinspoon, Associate Professor of Psychiatry, Emeritus at Harvard Medical School)

The use of medical weed is getting allowed more widely and treated federally legal under the controlled circumstances around the world. While hemp was previously regulated as an illegal substance, is now federally legalized under the Agriculture Improvements Act of 2018. It has been used to produce industrial, food and medicinal products. Marijuana, on the other hand, is still treated as federally illegal under the Controlled Substance Act. While people used it as an herbal remedy for centuries, nowadays people use it to relieve symptoms and treat various diseases. Growing these weeds requires large amount of spaces and volumes since they are plating horizontally. The aim of this studio is to design modular

vertical solutions and provide several fundamental advantages to the building itself. This project will use these modular systems to shade the building by creating parametric solutions through
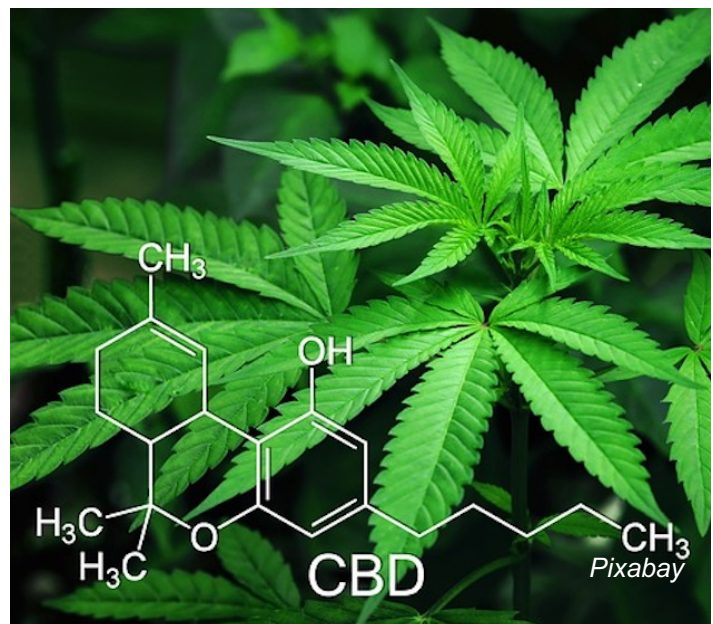
the double skin façade. During the development of the design, quantitative and qualitative solar radiation, shading and natural ventilation, lighting, illumination strategies will be examined through the given case study.

Research:

This studio is focusing on designing building-integrated shading elements in the <u>double skin façade</u> of Turk Telekom Headquarters, Ankara/Turkey. Two topics as spider webs and vertical weed will be used to create/weave these elements. We will seek to navigate between multiple scales and across disciplines to find alternative solutions for the building skin. The main goal is to decrease the energy consumption of the building by creating shading elements to minimuze the solar radiation. Quantitative and qualitative analysis will be explored during design process.

Research activities in the studio will investigate following topics during different phases of design:

Week 1-2: Precedents, Literature Review and Building Analysis
Week 3-5: Environmental Analysis and Schematic Design
Week 6-9: Design and Experimental Process
Week 10-14: Design Development

Program and Building:

The program of this studio is to design organic and synthetic shading elements in the double-skin façade by considering solar radiation. The design of this shading element is critical in this studio because it will affect the thermal performance of the building. The optimal solution to the performance will be achieved through the design process.

The building for this studio project is Turk Telekom Headquarters, which is a new symbol on main transportation axis in Ankara, Turkey. There are two components in this building design. First one is the office tower (working stations are settled) and the second one is the horizontal block where conference hall, technical system halls, network operation center and data centers are located. During the design phase, transparency, open office systems, use of interior gardens as social spaces and double skin facade were the major focuses. Double skin façade is used to control the space temperature better, to ventilate the offices naturally and to create a barrier to noise and pollution. In addition, motorized elements were designed at the exterior facade for outdoor air circulation through the space. This studio focus on double skin façade, to optimize the thermal performance of the headquarters.

Bibliography:

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- Alread, Jason; Leslie, Tom and Whitehead, Robert. Design-Tech: Building Science for Architects. Routledge, 2014.
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Turk Telekom Headquarters, Ankara/Turkey (Architect: A Architectural Design)

- Heusler, Winfried; Lieb, Rolf-Dieter ; Lutz, Martin and Oesterle,Eberhard. Double-Skin Facades. Prestel, 2001.
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- DeKay, Mark, and G. Z. Brown. Sun, Wind & Light: Architectural Design Strategies. 3rd ed. Wiley, 2014.
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- Dahl, Torben. Climate and Architecture. Routledge, 2011.
- Deplazes, Andrea. Constructing Architecture: Materials, Processes, Structures. Birkhäuser Architecture, 2008.
- Hawkes, Dean. The Environmental Tradition: Studies in the Architecture of Environment. Taylor & Francis, 1996.
- Hawkes, Dean, Wayne Forster, and Arup Associates. Architecture, Engineering and Environment. London:
- Laurence King Pub. in association with Arup, 2002.
- Lally, Sean. The Air from Other Planets. Lars Muller Publishers, 2014.
- Lovell, Jenny. Building Envelopes: An Integrated Approach. Princeton Architectural press, 2010.

Weekly Schedule:

Note: schedule below is subject to revision through the duration of the semester.

Introduction:

Thu 08.29	**INTRODUCTION I Weaving Double Skin Façade: Double W's**
	First day of class (Lottery and general presentation)
	5:00pm. Convocation, Aaron Davis Hall

W1   **Precedents, Literature Review and Building Analysis**
Mon 09.02   college closed / Labor Day
Thu 09.05   Monday schedule - Studio

W2
Mon 09.09   Studio
Thu 09.12   Pin-up: Precedents, Literature Review and Building Analysis

W3   **Environmental Analysis and Schematic Design**
Mon 09.16   Studio I 4pm-6pm: Presentation and Workshop: Sefaira and Diva by Yee Lin
Thu 09.19   Studio

W4
Mon 09.23   Studio
Thu 09.26   Studio- Pin-up: Environmental Analysis and Schematic Design
                      5:30pm. Sciame Lecture: Maria Fullaondo, Rm 107

W5
Mon 09.30   no classes / Rosh Hashanah
Thu 10.03   Studio
                      5:30pm. Sciame Lecture: Deborah Berke, Rm 107

W6   **Design and Experimental Process**
Mon 10.07   Studio
Thu 10.10   Studio
                      5:30pm. Sciame Lecture: Rahul Mehrotra with Filiep Decorte, Rm 107

W7
Mon 10.14   college closed / Columbus Day
Wed 10.16   Monday Schedule – Studio
                      5:30pm. Max Bond Lecture: Zena Howard, moderater Mabel Wilson, The New School
Thu 10.17   Studio

W8
Mon 10.21   Studio
Thu 10.24   Studio_Pin-up: Design and Experimental Process
                      5:30pm. Sciame Lecture: Jean-Pierre Pranlas-Descours, Rm 107

W9
Mon 10.28   Studio
Thu 10.31   **MID-REVIEW**

W10		**Design Development**
Mon	11.04	Studio
Thu	11.07	Studio
		5:30pm. Sciame Lecture: Håvard Breivik and Saskia Sassen, Rm 107

W11		
Mon	11.11	Studio
Thu	11.14	Studio
		6:00pm. Habana 500 colloquium, Rm 107

W12		
Mon	11.18	Studio
Thu	11.21	Studio

W13		
Mon	11.25	Studio
Thu	11.28	college closed / Thanksgiving

W14		
Mon	12.02	Studio
Thu	12.05	

W15		
TBD	12.09-12.12	**FINAL REVIEWS**
Fri	12.13	End of Semester assessment

W16		
Mon	12.15	Last Meeting. Final Studio Materials due for: SSA/CCNY Archive, end of semester assessment, Graduation Show, etc., as directed

Grading/Attendance Policies and Studio culture

Course Expectations:
- That students will develop a high level of independent thought and rigor and a willingness to go beyond both basic project requirements and their own perceived limits and abilities.
- That students will successfully complete all project requirements. No make-up or postponed project submissions will be accepted except in the case of medical emergencies or other extraordinary circumstances. Excused absences and project delays must be officially cleared by professor in advance in order to be considered valid.

Methods of Assessment:
- Attendance and participation in class discussions: 20%
- Project development in response to semester schedule: 50%
- Project presentation, completion and resolution: 30%

Note: The Research component of the studio will be weighed more heavily in assessment of graduate student work and class performance.

Key areas of Grading Assessment:
- **Studio performance & work habits:** Ability to respond to studio criticism & discourse in a consistent & clear manner throughout the course of the semester as demonstrated in the evolution and development of design work.
- **Clarity of representation & mastery of media:** Ability to utilize both digital and manual drawing and model-making techniques to precisely and creatively represent architectural ideas.
- **Pre-design:** Ability to prepare a comprehensive program for an architectural project that includes such

tasks as: an assessment of client and user needs; an inventory of spaces and their requirements; an analysis of site conditions (including existing buildings); a review of the relevant building codes and standards, including relevant sustainability requirements, and an assessment of their implications for the project; and a definition of site selection and design assessment criteria.

- **Research:** Understanding of the theoretical and applied research methodologies and practices used during the design process.
- **Integrated evaluations and decision-making design process:** Ability to demonstrate the skills associated with making integrated decisions across multiple systems and variables in the completion of a design project. This demonstration includes problem identification, setting evaluative criteria, analyzing solutions, and predicting the effectiveness of implementation.
- **Attendance**: Consistent level of preparation and on-time presence for each studio class and scheduled evening lectures.
- **Portfolio**: Completion of portfolio as directed by coordinator and attendance at all scheduled portfolio related events.

Grading Criteria:

A (+/-) Work meets all requirements and exceeds them. Presentations are virtually flawless, complete, and finely detailed. Work exhibits professional, "museum quality" level of craft. Student has developed an individual design process that shows a high level of independent thought and rigor. Work shows evidence of intense struggle to go beyond expectations, and beyond the student's own perceived limits of their abilities.

B (+/-) Work meets all requirements. Presentations are complete and finely detailed. Work exhibits professional level of craft. Student has developed an individual design process that shows a high level of independent thought and rigor.

C (+/-) Work meets minimum requirements. While presentations may be complete, student has struggled to develop an individual design process and/or is lacking in craft or design resolution.

D (+/) Work is below minimum requirements. Presentations are incomplete, student has struggled to develop an individual design process and/or is lacking in craft or design resolution.

F Work is well below minimum requirements. Student does not develop adequate design process, and/or does not finish work on time.

INC Grades of "incomplete" are not given under any circumstances unless there is evidence of a medical or personal emergency. In such cases, instructor and student develop a contract to complete work by a specified date, as per CCNY policy. Classes / work missed due to illness must be explained with a physician's note.

Notes:
C is the lowest passing grade for M.Arch I and M.Arch II students. No D grades are given to graduate students. Working in teams does not guarantee the same grade for each team member; grades are based on a range of criteria for each student.

For more information on grading guidelines and other CCNY policies and procedures, consult the current CCNY academic bulletins: https://www.ccny.cuny.edu/registrar/bulletins

Office Hours:
Office hours are set by appointment. If a student needs to speak in private with a studio critic, they must email in advance to request a meeting time. Students may seek office hour appointments to discuss any matters of concern including personal, private matters and general inquiries about course related work, grading, assessment and content.

Probation & Dismissal: for program specific information related to grades, academic standing, probation and dismissal, please see your program academic advisors:
B.Arch: Michael Miller mmiller@ccny.cuny.edu

Amy Daniel adaniel@ccny.cuny.edu
M.Arch: Hannah Borgeson hborgeson@ccny.cuny.edu

Studio Culture:
Working in the studio is mandatory. Studio culture is an important part of an architectural education. Please see the Spitzer School of Architecture Studio Culture Policy, which can be accessed on the SSA website here: https://ssa.ccny.cuny.edu/about/policies/.

Absence & Lateness:
Arriving more than ten minutes late to class will constitute an absence. Two unexcused absences will result in a whole letter grade deduction from a final grade; more than four will result in a failing grade. It is expected that all students will participate in all scheduled working, midterm and final reviews and contribute constructively to the discussion.

Absences due to Religious Observances:
Students who will miss any class sessions, exams, presentations, trips, or the like due to a religious observance should notify the instructor at the beginning of the semester so that appropriate adjustments for observance needs can be implemented. This could include an opportunity to make up any examination, study, or work requirement that is missed because of an absence due to a religious observance on any particular day or days.

Noise Policy:
The studio environment should be a quiet and respectful place where all students can work and think in peace. At no time may students play music out loud in studio, even at a low volume. If you desire to listen to music, either during class hours or after hours, headphones are a requirement. Conversations must also be kept to a reasonable volume to respect classmates and those students in adjacent studios.

Readings & Journals:
Students are expected to keep a journal or sketchbook throughout the duration of studio to document their thought process & take notes of any texts, books, terms or references that are mentioned by either the studio critic or fellow classmates and to selectively follow up on these and any other assigned readings before the next class.

Academic Integrity:
As a student you are expected to conduct yourself in a manner that reflects the ethical ideas of the profession of architecture. Any act of academic dishonesty not only raises questions about an individual's fitness to practice architecture, but also demeans the academic environment in which it occurred. Giving or receiving aid in examinations, and plagiarism are a violation of an assumed trust between the school and the student.

Plagiarism, i.e. the presentation as one's own work of words, drawings, ideas and opinions of someone else, is a serious instance of academic dishonesty in the context as cheating on examinations. The submission of any piece of work (written, drawn, built, or photocopied) is assumed by the school to guarantee that the thoughts and expressions in it are literally the student's own, executed by the student. All assignments must be the student's original work. Any copying, even short excerpts, from another book, article, or Internet source, published or unpublished, without proper attribution will result in automatic failure of the entire course.

The CCNY Academic Integrity Policy: https://www.ccny.cuny.edu/about/integrity
For citations, the Chicago Manual of Style is recommended:
http://www.chicagomanualofstyle.org/tools_citationguide.html

AccessAbility Center (Student Disability Services):
The AccessAbility center (AAC) facilitates equal access and coordinates reasonable accommodations, academic adjustments, and support services for City College students with disabilities while preserving the integrity of academic standards. Students who have self-identified with AAC to receive accommodations should inform the instructor at the beginning of the semester. (North Academic Center 1/218; 212-650-5913 or 212-650-6910 for TTY/TTD). https://www.ccny.cuny.edu/accessability

Library:

The school's library is a shared resource that is necessary supplement to all research and design work. Please direct questions to the library staff or the Architecture Librarian Nilda Sanchez: nsanchez@ccny.cuny.edu

NAAB (National Architectural Accrediting Board):

The National Architectural Accrediting Board (NAAB) is the sole agency authorized to accredit US professional degree programs in architecture. Since most state registration boards in the United States require any applicant for licensure to have graduated from a NAAB-accredited program, obtaining such a degree is an essential aspect of preparing for the professional practice of architecture. While graduation from a NAAB-accredited program does not assure registration, the accrediting process is intended to verify that each accredited program substantially meets those standards that, as a whole, comprise an appropriate education for an architect.

More specifically, the NAAB requires an accredited program to produce graduates who: are competent in a range of intellectual, spatial, technical, and interpersonal skills; understand the historical, socio-cultural, and environmental context of architecture; are able to solve architectural design problems, including the integration of technical systems and health and safety requirements; and comprehend architects' roles and responsibilities in society.

The following student performance criteria from the 2014 NAAB Conditions are addressed in this course:

Realm B: Building Practices, Technical Skills, And Knowledge. Graduates from NAAB-accredited programs must be able to comprehend the technical aspects of design, systems, and materials and be able to apply that comprehension to architectural solutions. In addition, the impact of such decisions on the environment must be well considered.

> **B.1 Pre-Design:** ability to prepare a comprehensive program for an architectural project that includes an assessment of client and user needs; an inventory of spaces and their requirements; an analysis of site conditions (including existing buildings); a review of the relevant building codes and standards, including relevant sustainability requirements, and an assessment of their implications for the project; and a definition of site selection and design assessment criteria.

Realm C: Integrated Architectural Solutions. Graduates from NAAB-accredited programs must be able to demonstrate that they have the ability to synthesize a wide range of variables into an integrated design solution.

> **C.1 Research:** understanding of the theoretical and applied research methodologies and practices used during the design process.

> **C.2 Integrated Evaluations and Decision-Making Design Process:** ability to demonstrate the skills associated with making integrated decisions across multiple systems and variables in the completion of a design project. This demonstration includes problem identification, setting evaluative criteria, analyzing solutions, and predicting the effectiveness of implementation.

Students should consult the NAAB website www.naab.org for additional information regarding student performance criteria and all other conditions for accreditation.

CONTACT INFORMATION:

Ahu Aydogan, PhD
Assistant Professor,
Spitzer School of Architecture, CCNY
Office: 3M19
aaydogan@ccny.cuny.edu
Office hours by appointment