Teaching Portfolio

Tianbao Hu

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Teaching Philosophy

I always thank those great teachers who lead me to a new world. They not only shared my knowledge but also shaped my values. My teaching philosophy is associated with the teaching methods of them and my reflection and rethinking.

Be Supportive/ Care for individual student

My early teacher shaped the first image of this beautiful profession. She was my second Chinese teacher in my middle school. Not only teaching with passion, how she treated different students also set an excellent example of dealing with inclusivity issues in school.

For young students, other than passing exams, the most significant barriers at school for a kid are about how to survive every little life difficulty. As my middle school was a boarding school, students were easily missing their parents. Also, sometimes, school bullying happens. Before she came to my class, the former teacher always ignored these "small" conflicts and showed little sympathy to the victims. However, she bravely showed a severe attitude to those bullies and made students in my class feel protected. At that time, I thought a teacher is a "warm" occupation, lighting the darkness on our way growing up. I believe, being supportive and encouraging can make a difference for students.

Focusing on school basic laws and discipline is undoubtedly correct, but as a good teacher, this is not enough. As students spend all weekdays in school, the school acts as a rehearsal room before they entering into the real stage. In my opinion, mental health values are crucial in these environments, perhaps more than intellectual development. How to own a positive thinking mode /treat the unhappiness/deal with struggles at school or even in life? For students, they cannot know the answer of the above question automatically. Family, of course, owns the duty to shape their children a more mature perspective of understanding those questions; at the same time, a good teacher will have empathy with their emotions and personal feelings.

Although collegiate teaching faces more mature targeted students than middle school teaching, the mental caring and respect of inclusivity are still worth focusing on. As for collegiate level of teaching, especially in architectural discipline, I will illustrate more specific points that I want to emphasize.

From essential to advanced level

Students are different. Some students have a relatively weak academic background and less competitive comprehensive skills, while some of them are smart and even talented, expecting challenging content. Balancing the level of teaching contents and allocating them in different parts of class appropriately create a reasonable arrangement of a class.
In my future teaching, I will apply this principle to prepare the course syllabus as well as a

specific lecture slide show. The goal is not only to make everyone understood but also delight the smartest group with challenging content.

Among them, how to successfully convey a complex provocative idea needs many detailed and concrete strategies. The goal of collegiate teaching in art school is not only about teaching solid knowledge, methods, and technologies, but also about sharing ideas in a broader multi-disciplinary context, spreading values of humanity and aesthetics. Students can get a dependable and robust professional outcome like software toolset. More importantly, they will be a mature independent thinker by grasping the critical methodologies of conducting research. They will become a problem solver facing many complexes, cross-boundary problems in the future. Therefore, my teaching principle of collegiate teaching, especially in architecture discipline, is about how to let students benefit from the goals and outcomes mentioned above.

Throughout my observation of good architecture teacher, I make a summary of how to even make an average student get fully trained step-by-step:

1. Establish authority by preparing fruitful class content

The teacher for my advanced studio is an excellent example of showing authority. He prepared every class with a spreadsheet: a title, course description, goal & outcome, a lecture with a slide show, and a series of reading contents. Every individual class has a specific topic and orientation; by putting them together, the whole semester course is about an in-depth area with multi-layer branches. Undoubtedly, collegiate teaching should involve educational content in similar depth by providing such a fruitful academic background. Proper preparation sets a tone of professionalism and a sense of authority. In this era of merging of disciplines, the prepared fruitful contents match the intricate interweaving knowledge relating to the designative topic. Moreover, thus, a student begins to own the opportunity to shape a complete understanding and reduce the possibilities of holding biased opinions. In my proposed class, I will try to use a similar framework to prepare the class material.

2. Repeat with different approach

Memory works through repetition. It is nearly impossible for a student to memorize an idea with once input. Therefore, I will try multiple ways to add the frequency of exposing the core concept/knowledge.

Here is an example of how I will do the repetition:
I will ask students to finish the relating readings as a warm-up. Then, during the class, I will ask them to divide into groups to have an in-class discussion. The following lecture will work as complementary and explanatory material to the reading. In this way, students will have multiple times thinking about the class material, which matches how human brain runs. Also, keeping emphasizing the keywords is another straightforward but practical teaching approach. I believe “3-time principle” could be a useful tip:
-Use bold font and emphasize the material in the syllabus for the first time;

-In that class, explain the concept in detail for the second time;
-At the end of the semester, do a summary phase to repeat the concept for the third time.

It is also workable to conduct the "3-time principle" in one class: in the beginning, middle, and end of a lecture/class.

3. Provide suggestive clue as a stepping-stone to abstraction

In my previous class, a studio teacher tried to illustrate what a design concept was. Rather than directly asking this abstract question, he asked what kind of spatial quality the designer tried to realize on the fourth floor of BEB building. As students were facing this built environment, it was easier to observe the spatial quality in this room. After understanding this specific example, students can make an analogy from specific to general.

This strategy is advantageous to undergrads, especially freshman, and sophomore. Suggestive and heuristic clues work as a bridge to in-depth content. Even in a class with seniors and grads, it is safer to give clues. After addressing a more in-depth statement, do not forget to ask students whether they understand or not. It is better to slow down the teaching pace when expressing advanced topics. Otherwise, there is a high risk that many students may do not understand the whole idea.

This strategy is also a useful approach when doing a critique. E.g., By asking questions on why making a design decision to the specific project, the instructor can lead students to put forward further queries relating to design methodology. Similarly, in my proposed class syllabus, I will ask students to do the study model at first. Then, group pin-up will work as a summary and an advancement to abstraction and conceptual world. It is necessary to conduct the basic model-making process. However, it is more valuable to do a review to enrich the study outcome with upper-level theoretical and methodological contents.

4. Encourage making and take advantage of desk-crit (individual talk)

Model-making is an essential learning process in studying architecture. In the initial state, the model serves as an experimental approach to test novel ideas. In the second semester of my first Grad year, my studio teacher noticed that I was not on the right track by spending too much time on making a good quality model. During the "desk-crit" (individual talk in class), he told me why iteration models encourage thinking in various directions. Throughout this talk, I began to realize that it is more meaningful to make an iteration of various study models in a relatively poor quality than creating one model with extraordinary precision and craftmanship. This is how an individual talk can work effectively to give specific guidance. In my future teaching, I will arrange more than one desk-crit timeslot for each assignment to ensure every student can get this kind of specific help.

5. Teach students how to think critically

Teaching students how to think, for me, is a vital role for college teachers. The instructor for my Urban Ecology class once kept asking me a serious of questions during the desk-crit. "Why did you make this design decision? How would you realize your design goal, and why

did you think the way you conducted could illustrate the concept most successfully…" Even though I felt so depressed when I had to face these tough questions, I grasped a meaningful thinking mode for becoming a mature designer with self-triggering thinking methods.

This semester, I have applied this method when doing my TA job for the Grad Core 01 studio. I have kept asking students in my section with similar questions. I think this thinking mode works universally to various kinds of design. In my future teaching, if I find out a student feels frustrated to make a design decision, I will try to use the desk-crit as a chance to ask them this kind of question to guide them to establish a designer thinking framework.

6. Generate provocative questions in group critique and encourage an open talk atmosphere

There is no fixed formula or a particular answer to do an architecture critique. As you can judge a design from any perspective (e.g., programmatical arrangement/ abstraction/ aesthetics/ tectonic/ cultural/ economic/ historical/ social/ …), it is better to invite more people to join in the talk. By inviting scholars with different subjective interest and focus as critics, various judgments on every single project can reach to a phenomenal discussion. In my previous studio critique, the professor said, "today was not a serious critique but an open discussion, an exhibition to see everybody's work." I think this is a great template to start a critique. More participation guarantees a more thorough collection of thoughts. In my proposed architecture course, I plan to invite critics from different academic backgrounds and research orientations. By doing this, I hope my students can benefit from gaining a variety of reading to the project.

7. Bring students' background

Each student has a different study/living/art background. Towards a student, rather than asking everyone to acquire the same new input, it's equally essential to bring their experience into the class and use them as an opportunity to generate a diversified path. As learning is a continuing process, bringing everyone's background admits the value of what you gained before. In my proposed course, I am planning to add warm-up assignments to know better about their background. E.g., "What's your most memorable experience of light? Do a charcoal drawing of 3 light experiences(11x11")." In a broader picture, this trains students to flexibly use grasped knowledge, which is a provocative approach to become innovative.

Summary

These summaries come from my observation during my study life, representing my initial understanding of collegiate teaching. With passion and the requirement of professionalism, I will testify the effectiveness of them with more teaching practice. By collecting more and more feedback, I will have a reflection on my teaching methods and adjusting the path. Only by touching to students, a teacher can honestly know them better. So, keep remembering, "Towards Student"!

Inclusivity Statement

In a long process of the effort of many social initiators, human society has realized the importance of inclusivity. College and university communities seek to establish a harmonious atmosphere embracing the campus culture and treasuring the core principles of inclusion, equity, access, agency, and mutual respect. This goal of communities is not only on campus but also broadly through our interactions worldwide.

Our Inclusive Classroom Projects focus on providing students an equal sense of respect and understanding, no matter their gender, color, race, and nationality, biological or self-awareness. We care for and protect every student's psychological sensitivity. As more and more artists are engaged in promoting the inclusive culture, art departments also participate in these practices. Sociological research proves that color, sexual orientation, and ethnic group have no relationships to one's success, intellectual development, and aesthetic sense. In the art and design discipline, many greatest artists recognize inclusivity and contribute to the fantastic diversified art world today.

Practically, I will take a series of actions to fulfill my inclusive class culture. In my future class, in the beginning, I will deliver questionnaires to collect every students' name, pronoun, interests, and identities. In this way, I will understand how to show respect to the individual student. Another particular way I practice inclusivity in teaching and learning in the classroom is to divide students in group talk and mix them up with various identities. In such a mixed circle, students can feel equal treatment. I will try to make this process happen naturally, not deliberately. Otherwise, some students may still feel a sense of offensive.

Similarly, during the critique, I will invite students with different identities to talk publicly. I will try to cover every student in case anyone feels neglected. During the individual talk period, I will smile and be caring for students in any identity. I will set the same academic standard for every student. No bias and prejudice are allowed in my class. If there is a biased issue in my class, I will warn the student convicting discrimination.

Inclusivity is a big issue, but it is composed of the specific actions mentioned above. As everyone is a “family member” of our sharing village, "the earth," we need to spend joint efforts to encourage this civilized and equalized culture.

Course Proposals

ARCHITECTURE AS MICRO-SYSTEM

Category: Architecture Studio/ Non-major elective
Credits: 3 Elective Credits.(14 students max)
Instructor: Y. Tian (ytian02@risd.edu) , T.Hu (thu@risd.edu)

An ecosystem is defined as "a community of interacting organisms and their environment functions as an ecological unit." Did you know that the hollow structure of bird bones act in aerodynamic function? Did you know that Zebra's camouflage skin not only reacts to its living environment but is also based on a molecular-scale bio-chemical positive/negative feedback mechanism? There is a mystery on form and its direct/indirect function/performance. So, how to design a "micro-system" as an architectural unit structurally and functionally? In this course, students will apply their research from natural materials, structures, systems, and behaviors, and then develop an integrative "micro-system." Using the RISD Nature Lab collections as primary resources, students will primarily conduct in-depth research for different types and scales of forms, from macroscopic to microscopic, from static to dynamic. While learning to use fundamental architectural analysis and design strategies, students will be expected to bring their own backgrounds into developing their "micro-system."

To reinforce the logic of the concept, students will develop components of their "micro-system" with parametric prototyping. The Grasshopper, a plug-in from Rhinoceros, will be taught and utilized as a tool to model performative, tectonic, and kinetic systems. By learning to create a series of prototypes of their concepts, students will gain the opportunity to develop iterations of various "micro-systems." The final project will be a synthesized design proposal with a self-determined "site" dependent on students' concepts and their architectural functions. During this course, students will produce physical and digital models, as well as architectural diagrams, as a series of speculative demonstrations of their research-based and performance-oriented designs.
(Estimated cost: $100-400)

Resilient Coastal Design

Category: Landscape Studio/ Major elective
Credits: 3 Elective Credits.(14 students max)
Instructor: T.Hu (thu@risd.edu)

Global climate issues (especially sea-level rise) are unignorable in the contemporary world. According to scientist's predictions based on data simulation, sea-level rise is becoming a more serious problem, particularly to coastal cities and areas. This course sets Providence as

an example, showing a thorough exploration path on how we can design the city in a preparational and far-sighted way. The whole design path combines the research and design parts.

Preliminary research involves inter-disciplinary background, such as meteorology, ecology, soil science, and topography, as well as professional toolsets, such as ArcGIS or other software. As designers, we will grasp the data collection skills for generating diagrams that illustrate different aspects of the sea-level rise problem. The following design part adds more goals for the landscape design. How could a terrain playground act as a shelter during a tsunami? How would the site be used in the next 10, 20, and 50 years according to predicted sea levels? This course not only allows students to master the expertise but also encourages them to think like an environmental activist. The final results may be fictional or experimental, but they provide visions or directions that trigger a more sophisticated and robust solution.
(Estimated cost: $200-500)

Inhabitable House：Poetic Path in Modern Architecture

Category: Architecture Seminar/ Major elective
Credits: 3 Elective Credits.(13 students max)
Instructor: T.Hu (thu@risd.edu)

Modern architecture, from its beginning, has encouraged the use of advanced technology to provide more people with better housing. Early theorists even envisioned an idealized future where people would get the benefits from technological development. However, the academic architectural world didn't go further into the technology-oriented Utopian world. Instead, many architecture theorists (such as Louis Kahn, Álvaro Siza, Luis Barragán, etc.) began to encourage students to use architecture as a language to address manifold academic issues. Their drawings and models vary in appearance but show similar sensitivity and empathy to the poetic nuance of light, form, and material. Rather than focusing on the practical aspect of building engineering, these projects, often being abstract and showing a more purely theoretical focus, are called "inhabitable houses."

This seminar encourages students to understand the timeline and contents of the inhabitable houses in different periods (the 30s, early 40s, post-war time, late 50s…), including architects' and their students' fictional works, essays on architectural theories, etc. This course relates to history, but it goes further. It focuses more on an open discussion and rethinking on these historical works.

"What can architecture do today?" This old question may be a good start for a new question. How did modern eras shape the views of these architects? What's the value of their focuses to our time? How can we get inspiration for their research approach, but address a new topic? By sharing readings and lectures as well as table talks, students will understand the essence of keeping the "wonderland" of academic architecture. Here,

architecture is just a medium to express your aesthetic pursuit and thinking freely.
(Estimated cost: $50)

Proposed Class Syllabus

ARCHITECTURE AS MICRO-SYSTEM

COURSE SYLLABUS

• Winter Session 2020 | Course Number TBD | Architecture as Micro-System | 3 Credits

• Meeting Times | Proposed Schedule BB | Every Tues. & Fri. / Wed. (Jan 08 & Jan 22, TBD) 1:10 pm - 6:10 pm

• Location | Request for BEB 3rd floor Studio (tables would be assigned by Department)

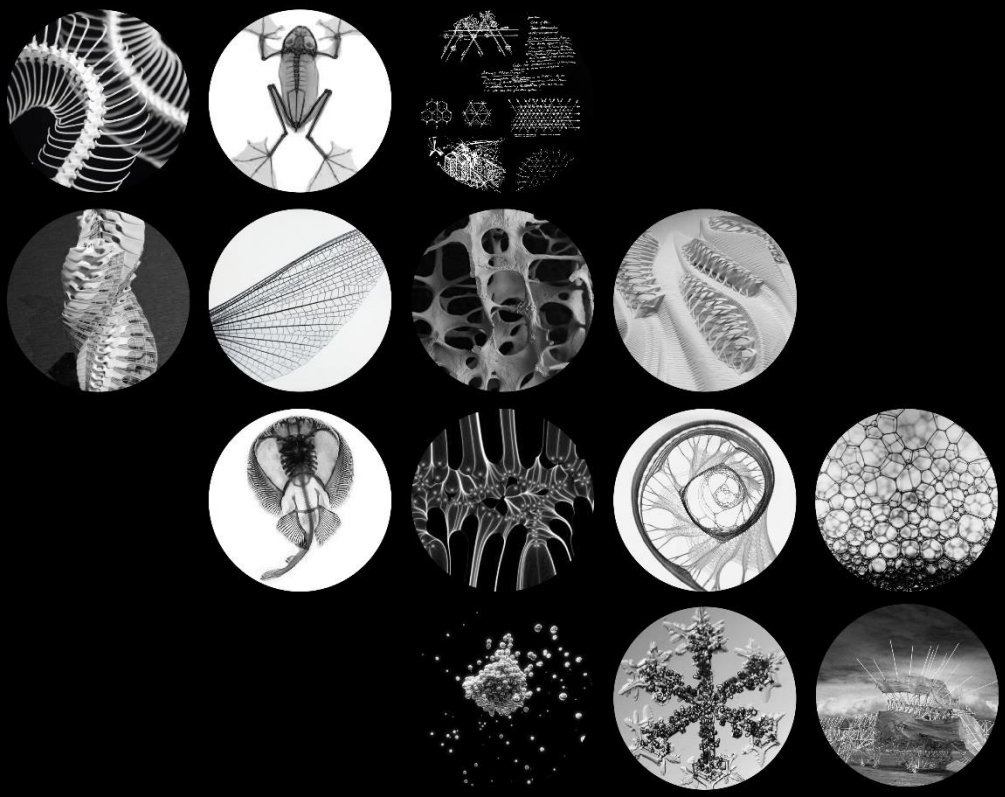
• Instructors | Yangchuan Tian (ytian02@risd.edu) ; Tianbao Hu (thu@risd.edu) (office hours by appointment)

COURSE DESCRIPTION

An ecosystem is defined as “a community of interacting organisms and their environmental functions as an ecological unit."[1] So, how could we design a *micro-system* as an architectural unit structurally and functionally? Reflecting and innovating from bio-system performance provide our future architecture a greater possibility to be more efficient and adaptable facing environmental challenges. Throughout this course, students will produce a series of speculative demonstrations of their research-based and performance-oriented design by different approaches. Using the City of Providence Museum of Natural History and Planetarium and RISD Nature Lab collections as primary resources, students will conduct in-depth research for different types and scales of forms, from macroscopic to microscopic, from static to dynamic. Student will apply their research from natural materials, structures, systems, and behaviors to develop an integrative “micro-system” through physical and digital models, architectural analysis, drawings, and diagrams.

While learning to use fundamental architectural design strategies, students will be expected to bring their own unique backgrounds and skillsets into developing their *micro-system*. To reinforce the logic of the concept, students will develop components of their *micro-system* with parametric prototyping. Grasshopper, a plug-in from Rhinoceros, will be taught and utilized as a tool to model performative, tectonic, and kinetic systems. By learning to create a series of prototypes of their concepts, students will gain the opportunity to create iterations of various *micro-system.* The final project will be a synthesized design proposal with a self-determined *site* dependent on students’ concepts and their architectural functions. Weekly project-based critique across studio will occur throughout the term with students and faculty.

[1] Oxford English Dictionary



ARCHITECTURE as [MICRO - SYSTEM]

WINTER SESSION

Open to all major

Department: Architecture
Term: Winter 2020 | 3 Credits
Schedule: Tuesday and Friday 1:10 - 6:10 pm
Location: Bayard Ewing Building (BEB)
Individual Desk Provided

Contact Instructors for questions:
Niko Tian | *ytian02@risd.edu*
Jonah Hu | *thu@risd.edu*

An ecosystem is defined as "a community of interacting organisms and their environment functions as an ecological unit." So, how could we design a "micro-system" as an architectural unit structurally and functionally? Reflecting and innovating from bio-system performance provide our future architecture a great possibility to be more efficient and adaptable facing environmental challenges. Throughout this course, students will produce a series of speculative demonstrations of their research-based and performance-oriented design by different approaches. Using *the RISD Nature Lab collections* as primary resources, students will conduct in-depth research for different types and scales of forms, from macroscopic to microscopic, from static to dynamic. Student will apply their research from natural materials, structures, systems, and behaviors, and produce physical and digital models, architectural analysis, drawings, and diagrams to develop an integrative "micro-system" individually.

The goal of this course is for students to develop a rigorous research and design practice individually and collaboratively. In the first half of class, students will identify their discovery and design direction through a series of research, readings, lectures and field trips. Each exercise and project will help students to consolidate and interpret their concepts more thoughtfully and thoroughly. Starting from the second half of the class, students will be taught to design functional components within an integrative system by exploring different *scales* of natural systems in Grasshopper. Students will practice both fundamental and advanced architectural and computational design strategies to express their system forms through a series of lectures, workshops, and projects.

Join us by registering winter-session course **Architecture as "Micro-system"**

Please show up on the first day of class if you are interested for more details!

COURSE OBJECTIVES

The goal of this course is for students to develop a rigorous research and design practice individually and collaboratively. In the first half of class, students will identify their discovery and design direction through a series of research, readings, lectures and field trips. Each exercise and project will help students to consolidate and interpret their concepts more thoughtfully and thoroughly. Starting from the second half of the class, students will be taught to design functional *components* within an integrative system by exploring different *scales* of natural systems in Grasshopper. Students will practice both fundamental and advanced architectural and computational design strategies to express their system forms through a series of lectures, workshops, and projects.

Understanding of the fundamental ideas and techniques of designing natural prototypes in Grasshopper will also boost their algorithmic skill of creating relationships between the corporeal conceptual patterns and architecture. The design methodologies taught in this course are thoroughly integrated with various design processes and practice, in conjunction with their realization through the introduction of several fabrication technologies, such as laser cutting and 3D printing. This course also functions as a workshop studio for students to learn to create systematic and comprehensive model design of naturally derived forms and systems from architectural perspectives and languages. As an architecture community, we will use conventions of architectural representation and architectural modeling to suggest new ways of understanding the built-in environment both inside and outside of the structures we occupy; we will also use diverse forms of communication and computation to address environmental issues.

COURSE GOALS

- To realize natural performance in the architectural design field more profoundly;
- To engage and understand architectural techniques and capacities of describing three-dimensional forms in space through two-dimensional drawings;
- To originate new practical possibilities of structure from the composition or behaviors of organisms;
- To compare and contrast the demands and tectonics between architecture and natural organisms;
- To evaluate the feasibility of innovative concepts and provide corresponding solutions.

REQUIREMENTS +STUDENT LEARNING OUTCOMES

- Methods to draw and produce 2D & 3D architectural drawings and diagrams;
- Fundamental architectural modeling skills physically and digitally;
- Basic Rhino & Grasshopper knowledge;
- Professional verbal presentation strategies and logical architectural thinking;
- Strategies to develop a research-based architectural scheme independently;
- Brief history of bio-design and relative application methods in the architecture industry;
- A final portfolio that will showcase a wide range of systematic and analytical process with a deep understanding between biotic and architectural structure both artistically and logically.

Proposed Class Schedule

WEEK	CLASS NO.	DATE	SESSOIN TYPE	SESSION CONTENT	PROJECT
EMERGING					
PART 1 - NATURAL COMPONENT AND SYSTEM RESEARCH					
WK1	**1**	Fri. Jan 03	Introduction + Workshop	• Course Introduction; • Workshop #1 - Introduction to Architectural Drawing and Modeling: Overview (leads, line-weights), Drawing Types, Tools and Supplies	• Project #1 assigned - "The Component" • Project #1 is due Jan 10 - Email your final decision of your interests and focus to both instructors no later than Jan 05 @ 6pm.
			Optional Training	• Nature Lab equipment group training on weekend with Benedict Gagliardi (Time TBD)	
WK2	**2**	T Jan 07	Lecture + Desk Critique	• Guest Lecture #1 by Jennifer Bissonette (at Nature Lab/TBD) about Natural Science and Trans-disciplinary Design; Nature Lab Tour (TBD); • Work Session & Desk Critique	• Prepare to have conceptual sketches and mock-up models ready to show and discuss
	3	F Jan 10	Lecture + Project #1 Review	• Lecture #2 Design Prototyping Theory • Project #1 Pin-up + Review	• Documentation of Project #1 due by Jan 14 @ 6pm • Project #2 assigned — "A Wonderful System" • Project #2 due Jan 17 before class.
DEVELOPING					
		TBD	Optional Training	• Workshop #2 - CNC, Wood Shop, Laser Cutting and 3D Printing Training Session @ BEB Basement with James Dean	
		TBD	Optional Mid-term Meeting	Private Meeting for Grade Update or Strategy Improvement	

PART 2 - PROTOTYPING AND SYNTHESIS DESIGN					
WK3	**4**	T Jan 14	Lecture + Desk Critique	• Lecture #3 Stochastic & Field System Case Study and Workshop • Project #2 Work Session & Desk Critique	
	5	W Jan 15	Workshop + Desk Critique	• Workshop #3 - Grasshopper Training Session • Work Session & Project #2 Desk Critique	
	6	F Jan 17	Project #2 Review	• Project #2 Pin-up + Review (Guest Critic TBD)	• Documentation of Project #2 due by Jan 21 @ 6pm • Project #3 assigned — "Digital & Physical System Prototypes" • Project #3 is due Jan 24 before class.
ADVANCING					
WK4	**7**	T Jan 21	Workshop + Desk Critique	• Work Session & Project #3 Desk Critique	
	8	F Jan 24	Lecture + Project #3 Review	• Lecture #4 Ecosystem and Environmental Design Strategy • Project #3 Due + Review	• Documentation of Project #3 due by Jan 28 @ 6pm • Project #4 assigned — "Micro-system" • ***Deliverables: Final Due Feb. 04***
WK5	**9**	T Jan 28	Desk Critique	• Project #4 Working Session + Desk Critique	
	10	W Jan 29	Desk Critique	• Project #4 Work Session & Desk Critique	
	11	F Jan 31		Project #4 Working Session + Desk Critique - 50% done as expected	
WK6	**12**	T Feb 04	Project #4 Review		• Project #4 Pin-up + Final Review (Guest Critic TBD) • Final works should be pinned up 30 mins before class. • Documentation of Project #4 due by Feb 6 @ 6pm for grading

Proposed Class Project

- **Project #1** Assigned — "The Component" — This is a research-based project. By observing and examining the specimens at the RISD Nature Lab, students will be asked to choose no more than three different living/static components, such as structures, patterns, living behaviors, natural properties, ecological functions, etc. This project asks students to translate the selected "component" into an abstract three-dimensional structure — rather than creating a sculptural or artistic form, the model focuses more on the mechanism behind the form.
- **Goals**:

  - an initial contact with the massive specimens of the Nature Lab and asks them to conduct the abstract translation of these complex natural shapes with different entry points;

  - an initial understanding of the "study model" as a tool to deepen understanding, to further confirm or develop the initial understanding;

  - a disassembly/transformation methodology, laying the foundation for the subsequent multi-dimensional design.

- **Outcomes**:

  - to understand two-dimensional drawings as a way to describe the measured, precise characteristics of three-dimensional objects as they are in space by carefully considering the idea of representation as a designed entity;

  - to grasp the skillset of using microscope;

  - to advance this dynamic learning process.

Requirements & Deliverables:

- Students will create one sketch model (no smaller than 8" cube size) for each component to reveal its potential characteristic of your interest. Different strategies of making models are welcomed. The basic technique of making architectural models will be shown and taught in class. Material could be fabric, wood, wires, Bristol, chipboard, cardboard, etc.
- Students are also asked to descriptively "dissect" these components through a set of precise and measured orthographic projection drawings (one plan and two sections 1"=1'-0" scale). These drawings should be precisely measured and should convey depth and hierarchy through the use of line weights. Drawings for each component should layout on a 10"×10" Stonehenge paper (one drawing on each paper). Total of three papers at least.

- Analytical sketches and notes should be scanned and shown as supplements for review.
- The images/photographs of selected components need to be presented at final review.
- Project #1 is due Jan 10 - Email your final decision of your interests and focus to both instructors no later than Jan 05 @ 6pm.

- **Project #2** Assigned — "A Wonderful System" — Now you are asked to advance your system by adding performative and functional aspects through research on your components. A new drawing has to describe an animate quality of that component in "layers." Drawings could imagine or be inspired from the steps of the component's activity/behavior/movement — floating, flying, contracting, rotating, etc. Analytical research needs to be shown in the drawing to demonstrate your logic and concept. This exercise introduces speculation through representation — how to reveal qualities of engagement, movement, and change through the rhetoric of drawing. This process will be carried out through a succession of design tasks that ask students to develop a relationship between representation and object through iterative drawing, a process of acute perception and revelation.

- **Goals**:

- an observation of the dynamic activities and physiological phenomena of living things from the perspective of development/metabolism
- an understanding of microsystem stands for as superposition of various organisms in a creatures' body, aiming to complete different life activities;
- an understanding of the logic and essence behind the form;
- research on more possibilities of architecture.

- **Outcomes**:

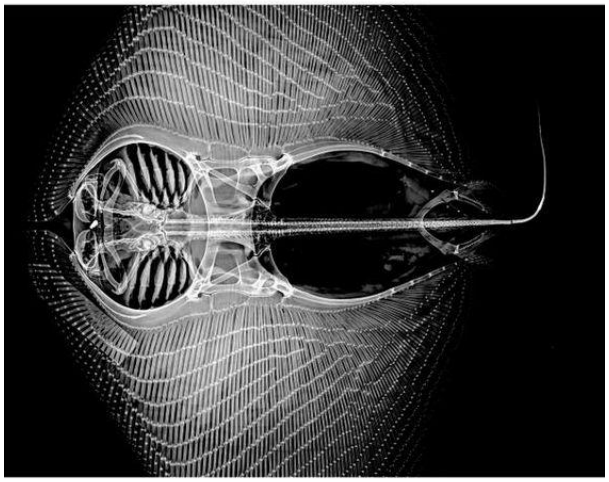
- to advance the methodology based on abstraction, capturing the delicate poetry behind events and phenomena in life;

- to contrast the long-standing modern principle, “less is more”, Minimalism thinking of reduction use of ornaments;
- to break through the boundaries of architectural research from an interdisciplinary Perspective;
- to experience the dual unity of "shape" and "use" in biological systems, and further, to consider the inherent unity between the " form" and "performance" of architecture.

Requirements & Deliverables:

- Drawings could show the exploring changes in orientation with/of the object in space as well as telling a story of how each works as an individual system. The process of re-drawing will serve as a transformational tool, to speculate on the spatial possibilities embedded within the component character. The goal is to understand how representation is an active agent in the design process, and how 2D drawings represent 3D objects in time and space. Drawings for each component should layout on a 18”×24” Stonehenge paper as well as the diagram drawing (3 papers in total).

- Project #2 due Jan 17 before class.



- **Project #3** — “Digital & Physical System Prototypes” — Inspired from your previous drawings, this assignment pushes you forward to create three physical models and a series of images of each conceptual natural system component — Fractal, Stochastic, Field, etc. There are many algorithm-based patterns which match the rules in the physical world. In this phase, students will grasp the fundamental expertise of algorithmic design tool (Grasshopper and plug-ins) to visualize the natural pattern or ecosystem which you are interested in. What we use Grasshopper to create is neither a real functional building

element nor a pure form without meaning but a prototype which has the potential to meet various demands by changing the parameter of its components. In this exercise, you will test by changing the parameters of two components and use one or two design properties (i.e. sunlight orientation, user circulation, wind direction, etc) as a target to judge the variable results. The way of practice in the field will predict the setbacks for architects to make better design decision.

- **Goals**:

- an understanding of the advantages or limitations of algorithmic logic simulations to reconstruct natural systems
- an understanding of how grasshopper helps to fastly visualize high-order iterations of previous research results, as well as adapting the prototype to designs of various scales and presenting multiple design potentials
- an initial understanding of a new workflow for digital construction by directly generating complex organic structures with sophisticated algorithms.

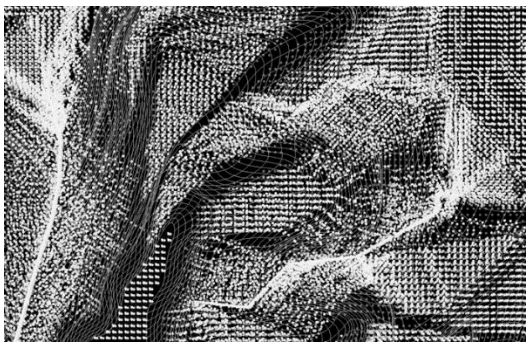
- **Outcomes**:

- to grasp the software skill of grasshopper
- to learn basic rendering tool
- to capture the mathematical "law" or structure behind complex organic forms

Requirement & Deliverables:

- A series of at least four digital prototype rendering images of <u>each</u> component are required related to your conceptual design of structural skin, flexible envelope, growth pattern, or propose your own. (Details of the digital requirement TBD)
- Creating a PDF includes the picture of your components, the screenshots of your Grasshopper codes and at least eight rendering images. During the review, students will be expected to conclude one clear thesis point on how the change of these parameters result in what kind of design performance you want.
- *Software instruction and samples will be provided in class.

- Project #3 is due Jan 24 before class.



- **Project #4** Assigned — "Micro-system" — For the final project, each student will design an animal shelter in a self-defined area. For example, it can be an urban habitat for coyote or raccoon, a highway safety sky bridge/corridor for deer, a wetland pavilion for flamingos, or a canopy for silverback gorillas. Students will adapt their initial abstract system to the specifically self-defined "site" for specific animals throughout the development of previous projects. As the context of the project, this "site" should be considered as a location with certain kinds of ecological/environmental/social/cultural conditions, that your "micro-systems" would work as a solution. Your design proposals will need to combine adaptable space with fixed self-defined programs and structural construction. Your three components should be integrated as a "DNA" of your system — each function should be demonstrated clearly with diagrams, such as how they work together reciprocally throughout the time from the animals' perspective. The final project requires re-thinking and re-imagining the interface between these things to create an innovative "micro-system."

· **Goals**:
- a deeper understanding of how parameter links "performance";
- a integrate thinking method to combine multiple layers;

· **Outcomes**:
- to gain the skillset of various aspects of architecture presentation;
- to form a complete architecture design, which also enriches student's portfolio.

Requirement & Deliverables:

- The final design proposals should be drawn from a close analysis of the "site" as a motivator of architectural form and consider how to transform (improve, through connection, for example) existing site conditions.

- Students must consider and represent how the edges of site and building dialogue with surrounding terrain, mass transit, circulation, context, etc.
- Everything you've produced before should be pinned up for final review.

Deliverables: Final Due Feb. 04

- 100 Word Explanation of Design Intentions
- Conceptual Diagrams of Initial Components
- Site Plan @ scale TBD with instructors
- Analytical Diagrams: system functions, circulation, programmatic, site strategies
- Physical Model @ scale TBD with instructors
- Plan and Section Drawings @ scale TBD with instructors
- 3D Representation including at least one eye-level Site Perspective or Axonometric

- Final works should be pinned up 30 mins before class in advance.
- Documentation of Project #4 due by Feb 6 @ 6pm

ITP Proposal

The goals of the this teaching practice session are to provide a short class opportunity for you to learn to convey information, promote learning, and reflect on your own teaching and learning ability.

Titile: Performance-oriented Biomimicry Design
Time: Oct 23
Length: 25min
Goals:
-to activate students' different background in architectural design
-to link students' experience of daily design object to this subject
-to advance students' focus on the inherent performance behind a natural form

Outcomes:
- an entry-level understanding of big architectural concept: SECTION & TRANSFORMATION
- a distinction of iteral and abstract approach of form transformation
- a in-depth understanding of why performance-oriented design is meaningful
-

Step:
1.Preparation
Distribute pens and papers
2.Warm-up
Draw a section of a pepper and design a dog house by translating the sectional form of pepper
3.Group Critique
Pin-up students on the wall
Open discussion
4.Lecture with questions
Definition
Examples:
01 Bird Mouth-Japanese High-speed Train
02 Wave – Aqua Tower in Chicago
Comparison Table
Summary

Midterm Feedback Form

(This form is anonymous.)

Architecture as Micro-system

Instructor: Y. Tian, T. Hu

Course Goals

- To explore a unique standpoint from zooming into the micro world to start your design
- To understand in the "design from research" methodology, how questions become a triggering factor and how process models manifest potential directions
- To gain the expertise of using the resources in Nature Lab (microscope, TEM)
- To form a critical design judging points (whether literal or abstract, whether spatially complex or conceptually complicated, reasonable or arbitrary, etc.)
- To both gain career (software expertise: rhino & grasshopper) and academic benefits (models and drawings to put into your portfolio)

Your Major: _____

Your Grade: _____

Date: _____(MM/DD/YY)

This class provides me with a basic knowledge base of architecture.

Strongly agree 5 4 3 2 1 Strongly disagree

This class involves an attractive interdisciplinary design/research area.

Strongly agree 5 4 3 2 1 Strongly disagree

The instructors express their subjective ideas clearly.

Strongly agree 5 4 3 2 1 Strongly disagree

The instructors explain architectual jargon and software techniques understandably.

Strongly agree 5 4 3 2 1 Strongly disagree

The instructors encourage class discussion.

Strongly agree 5 4 3 2 1 Strongly disagree

You understood the purpose of the assigned materials in the course.

Strongly agree 5 4 3 2 1 Strongly disagree

Are the assignments clear?

Strongly agree 5 4 3 2 1 Strongly disagree

What do you like most about this course? What would you like more in this course?

_____

_____

_____

Do you have any suggestion to make this course better?

_____

_____

_____

Assessment Rubric

Criteria	Advanced 3	Emerging 2	Novice 1	Beginner 0
Effort & Work Time	Student worked with passion, beyond the time expectations during and outside of class and/or tried a wide variety of problem-solving approaches.	Student was on task during class, committed the required amount of time outside of class, and tried some problem-solving approaches.	Student was occasionally on task during class, partly committed the required amount of time outside of class and tried a few problem-solving approaches.	Student did not put in the expected effort in class, did not commit the required amount of time outside of class and did not attempt problem solving.
Software Skill + Craftsmanship	Student demonstrated a superior understanding of the software skill and model craftmanship in the architecture studio. All of the models & digital drawings are presented in a clear way.	Student demonstrated above average understanding of the technical skills in the architecture studio. Student had few technical and craftsmanship errors	Student showcased an average understanding of the technical skills in the architecture studio. Student had many technical and craftsmanship errors.	Student failed to comprehend basic technical skills in the architecture studio. Student rarely creates a finished work that is aesthetically pleasing and technically correct.
Concept Development + Expression	Student exceeded the expectation of the concepts and the idea making of each assignment as innovative and insightful. The logical expression in the presentation shows a persuasive argument.	Student communicated concepts clearly and thoroughly through models and presentations. Student tries some playful and insightful idea.	Student communicated concept relatively clearly with a few unclarities through models and presentation.	Student communicated little logical ideas through models and presentation.
Assignment + Final Project	Student excelled at the demonstration of the assigned parameters and added a rich personal contribution.	Student satisfied the assigned parameters and added rich personal contribution.	Student partly satisfied the assigned parameters and added rich personal contribution.	Student failed to address the assigned parameters completely.

A 12	B 9	C 6	D 3
A- 11	B- 8	C- 5	D- 2
B+ 10	C+ 7	D+ 4	F 1

Critique Statement

As architecture studio encourages the methodology of “thinking through making,” the architectural critique is not only a summative evaluation after students’ intensive output of workload but also an open-minded talk on any related topics of students’ design. The instructor uses critiquing as a chance to share with students your experiences and understandings, to enable them to see various options or to remind students to reflect on their decisions.

Dialectical/ Multi-layered Judgment.

On the one hand, the instructor needs to discover the positive aspect of his/her design, such as:

-presentation clarity (speech/ diagrams/ drawings/ models)
-thoughtful theme
-in-depth research
-diversified exploration
-creative/broad approach
-feasibility of the project

On the other hand, as every coin has two sides, a broad idea could be either imaginative/utopian or impractical/idealized. The instructor needs to help students to understand the criteria of design, which may vary from one category to another. Critiquing always involves questions on whether students can give the audience a convincing explanation of the benefit/cost of a design movement in different aspects.

Simple or Complex? Program & Form Integration.

Clarity and simplicity make a design well-organized. However, a sophisticated form shows more playfulness and exciting moments. Architectural school always encourages students to discover interesting form.

For simple form, critiques promote a student to think:

1 How does this simple geometry form（or not）a strong concept?
2 How could the simple geometry be more dynamic/exaggerated/crazy?
3 Do the different uses/programs match the same building height/ spatial atmosphere/ fenestration style/ etc? If not, why or how could they?

For complex form, critiques promote a student to think:

1. How was geometric complexity reached step-by-step? Do the iterations of study models and diagrams explain the concept development clearly? Is there any arbitrariness in the form development process?
2. Is the complicated shape hard to read? If so, what suggestions would help to demonstrate a self-evident design?
3. Is there any circulation/structure problem of the form?

Criticism Can Be Encouraging and Inspiring.

Most students spend an extensive amount of time, generating a series of presentation documents. Students' logical flaws or low craftsmanship may occur besides broad ideas and steps. The main aim of the architectural studio is to advance students on how to go forward with the design process by responding to different layers of needs. The goal is a robust and mature design thinking mode while avoiding unnecessary psychological pressures. Our critiques will show a supportive attitude and will recognize inclusivity in terms of the variety of ways one may contribute as well as a variety of critique formats.

There are some tips of critiquing:

1. We will push harder during the informal desk-critiques and be more comparative and community-oriented during the collective presentation.
2. We will notice what other critics say and contribute diversified content to balance the class atmosphere, e.g., one critic may appreciate the style of a student, while another doesn't think the concept was clearly-expressed. Still, with additional specific comments by others, a variety of ideas may balance the two.

Be Professional; Avoid Being Personal.

Everyone has his/her taste. Architectural critiques unavoidably contain individual voices. “I like/dislike it” is a standard way of expressing an attitude, but it is not a critical way to judge or evaluate a design project. The critique will offer each student sufficient design feedback and will set an example of how one can become a critic of other architects/artists/designers' projects.