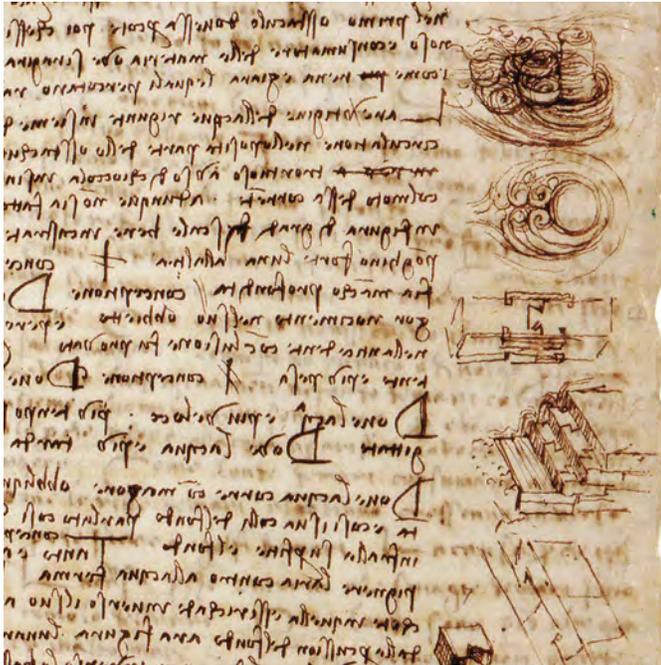


ARCH4041/5051/6041: Options Studio

Resilience Reinforced: advanced precast systems for regional water infrastructure challenges

Instructors: Kentaro Tsubaki, Associate Professor / Charles Jones, Lecturer



Partial view of Sheet 15B (back), fol. 22R. Codex Leicester, Leonardo Da Vinci

Course Introduction:

"As soon as the river is prevented from flowing further in its course straight ahead, the river gains in depth. The river hollows out the ground at the point where its course changes. No moving body, not even water, loses its entire kinetic energy when it hits something. After the impact the movement looks for a path by which it can continue."

From *the Codex Leicester*, Leonardo Da Vinci.

The *Leicester Codex* is one of the most important manuscripts Leonardo Da Vinci produced in the early 16C. Through the collection of his scientific writing and meticulous sketches, he speculates on various natural phenomena, primarily through the observation of one of the most fundamental substances, **water** and its interaction with **the earth**. Leonardo then proposes practical applications "for maintaining riverbanks, setting piles in river bottoms, constructing and maintaining dams and properly joining canals and rivers."¹ Preserving the waterways by controlling riverbank erosion was a significant engineering issue of Leonardo's time. He was fascinated with the role of technology in harnessing the mystery and the power of water.

What was relevant for Leonardo five centuries ago takes an incredible sense of urgency now, as 40% of the US population

living in the coastal cities confronts sea level rise due to climate change. **The studio** aims to explore **the potential for advanced precast concrete systems** to address this critical issue of our time.

We occupy the Mississippi Delta, the complex ecological system formed by the soil deposits interacting with the river and the gulf. In this soft, fluid ground, finding stability is a constant challenge. Concrete offers the opportunity for a symbiotic relationship between this landscape and the built environment. Although precast systems are prevalent, the recent technological advancement is not readily integrated nor exploited in this type of application, both from the performance and aesthetic perspective. It presents opportunities to explore advanced design and fabrication processes, particularly in the area of water flow and erosion control as we contemplate on a productive occupation of water edge in the urban context. The Greater New Orleans Urban Water Plan will be our vehicle and guide for the design investigation and the context for future implementation. The architectural and infrastructural solutions developed through the studio are nationally relevant, as the water-related issues are no longer unique only to our region.

This research-based studio is made possible by the generous support of **the PCI Foundation**. We anticipate multiple collaborative research opportunities with our industry partners to explore advanced fabrication techniques at or near full-scale. Field trips and plant visits are critical educational components of the studio during and beyond the fall semester, including funded travel to the PCI Convention in the spring.



Asahi Town, Hokkaido 1988, Japan Photo: Toshio Shibata

¹ John P. O'Neill, Ed. Leonardo Da Vinci Master Draftsman. Metropolitan Museum of Art, New York, 2003. P625

Course Information:

Name: Advanced Architectural Elective

Number: ARCH4041/5051/6041

Narrative: Advanced elective studios offer a range of topics and projects that explore a variety of architectural issues and areas of research. Students choose elective studios that suit their interests, needs and goals in order to focus their studies while gaining experience within a broader cultural and disciplinary field. This concentration develops areas of expertise beneficial to future professional growth.

Prerequisite: ARCH3032/6032 or DSGN3200/7200

Co-requisite: ARCH4352/6352

Credits: (6) semester credit hours

Meeting Place: RMH501

Meeting Time: MWF 01:00-05:00 PM

Instructor Information:

Charles Jones, RA., Lecturer

Email: cjones30@tulane.edu

Office Phone: 504.460.5633 (Mobile)

Office Hours: Day/Time/Place or by appointment

Name: Kentaro Tsubaki, AIA., Associate Professor

Office: RMH303b

Office Hours: M/F Noon-1:00PM (or by appointment)

Office Phone: 504.314.2345

E-mail address: ksubaki@tulane.edu

Featured NAAB Student Performance Criteria (2014):

A.8 Cultural Diversity and Social Equity: *Understanding* of the diverse needs, values, behavioral norms, physical abilities, and social and spatial patterns that characterize different cultures and individuals and the responsibility of the architect to ensure equity of access to sites, buildings, and structures.

B.2 Site Design: *Ability* to respond to site characteristics, including urban context and developmental patterning, historical fabric, soil, topography, ecology, climate, and building orientation, in the development of a project design.

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.

Expected Learning Outcomes:

Student will be able to:

- analyze and understand the impact of water management strategies in urban conditions from socio-cultural and human behavioral perspective.
- apply research and analysis to a tangible site and architectural design strategies.
- utilize advanced techniques to design and fabricate architectural components through iterative prototyping at or near full scale.

The result will be documented and demonstrated in near full-scale prototype components, representational drawings and models, process studies; verbal presentations at formal reviews.

General Expectations:

Students are expected to work regularly and productively in fulfillment of the assignments. In order to receive effective criticism, students are expected to come to the studio with ongoing **committed** analog/digital explorations and/or physical constructs demonstrating commitment to the work. Superficial changes to a project or merely verbal descriptions of an idea **cannot be critiqued**. All work is to be the product of the individual, unless teamwork is required. Students are also expected to integrate knowledge and skills acquired in previous courses. During group pinups, individuals are expected to carefully listen and absorb critiques directed toward other projects and apply what is relevant to their own work. Not all projects will be addressed comprehensively; instead, new serious and significant design ideas, that contribute to the general progress of the studio merit comment.

Students must work in the studio space during scheduled hours and be prepared to discuss the progress of their work with the instructor regularly (minimum of once per week). Students planning to work in the computer lab must notify the instructor and arrange with another student to notify them when impromptu studio meetings occur.

The schedule will be tuned from day to day, based on the progress of the class as a whole. Expect to spend a significant amount of time working on your project outside of the scheduled course hours.

Studio Communication:

The Tulane e-mail system is an essential means communication. Students are responsible for maintaining an active Tulane e-mail account checked daily.

Attendance Policy:

Students are responsible for attending class. All absences must be reported to the course instructor prior to the beginning of the class; the only excused absences are those for reasons of health, significant outside activity or crisis. Unexcused absences could reduce the course grade, as will late arrival or early departure from class. Three consecutive absences or four nonconsecutive absences will, in normal circumstances lead to WF grade. **A meeting with the TSA Director of Student Affairs will be required after TWO unexcused absences.** For further details, refer to the academic policies on Tulane School of Architecture website at: <http://architecture.tulane.edu/current-students/student-information>

TSA Lecture Series: Attendance Requirements

Students are expected to attend all Monday night lectures in the TSA series. Attendance will be coordinated through individual studio professors along with submission of any lecture response assignments. Note that scheduling conflicts due to evening classes or employment must be brought to the attention of your studio professor in advance. The robust lecture

series should be considered an integral part of design education as well as a forum for the prescient issues of current architectural thought.

Grading Distribution and Evaluation:

Phase I: Research/Analysis and Design	40%
Phase II: Design Dev and Fabrication	40%
Verbal and Graphic Presentations:	10%
Digital Folio Documentation:	10%

Evaluation of student performance is based upon daily studio process as well as the product. Improvement and growth are the keys. The instructor will conduct his/her expert assessment on student performance following each major stage of the semester. Please note that this is not a mathematically quantifiable assessment. It is based on the experienced judgment of student work. The following general criteria will be considered: (1) strength of idea; (2) articulation and development; (3) technical competency, clarity, and craft; (4) concise verbal/written presentation; (5) passion, commitment, dedication and work ethic.

A (excellent) exceptional performance; exceeding the requirements of the course, showing strong academic initiative and independent resourcefulness.

B (good) performance above the norm; accurate and complete; beyond the minimum requirements of the course; work demonstrates marked progress and initiative.

C (average) satisfactory work that adequately meets minimum requirements and demonstrates satisfactory comprehension, communication skills, and effort; demonstrates little initiative to investigate the problem without substantial prodding of the instructor and/or work shows little improvement.

D (inferior) unsatisfactorily meets minimum requirements; demonstrates minimum comprehension, communication skills, and effort at an inferior level; initiative lacking and/or improvement not noticeable.

F (failing) does not meet minimum requirements; fails to adequately demonstrate comprehension, communication skills, and effort

Incomplete and Late Work:

Work that is not adequately represented or fails to meet the minimum standards for completion will not be discussed in reviews. Additionally, unexcused absence from a review will result in a failure for that portion of the semester. Late work will only be accepted with the permission of the instructor. Work submitted after the final day of classes is not acceptable without written permission from the Dean. Any late work accepted will be penalized 10% for the first day of lateness, and 5% per day thereafter. (The first day of lateness begins immediately after the deadline, and include weekends). Extensions for medical or family emergencies must be requested immediately after the event and in advance of the deadline, and must be supported by adequate documentation.

Computer Requirements and Guidelines:

Students are required to provide and maintain their own laptop computers for use during and after the class. See the TSA's current student website for minimum specifications: <http://architecture.tulane.edu/current-students/student-information>. Technical difficulties, viruses, crashes, server and printing problems, or corrupted files will not be accepted as legitimate excuses for performance failure.

ALL WORK SHOULD BE CONTINUOUSLY SAVED AND REGULARLY BACKED UP.

Required Equipment / Software / Materials:

Software:

3D modeling software: AutoCad, Rhino
2D graphics software: Adobe Creative Suite (Photoshop, Illustrator, Acrobat, etc.)

Digital Portfolio:

Students are required to maintain a **meticulous record** of the design process in digital format. Digital files of the process materials (scanned sketches, photos of iterative sketch models etc.) and the final products (presentation drawings, physical and digital models) must be submitted according to specified formats at designated times throughout the semester. Files must be uploaded to the designated course folder (on the TSA public server; <ftp.arch.tulane.edu> or as per instructors discretion).

Readings and Articles:

These will be assigned throughout the semester and posted on the course website.

Environmental Responsibility:

Aerosol paints, spray glues or fixatives, etc. must not be used inside the building. Appropriate sanctions (full letter grade reduction) will be levied against Violators

Studio Culture:

The Tulane School of Architecture fully supports the studio-based model as central to the curriculum for architectural education and relies on the studio to provide and promote a healthy environment for creative and engaged learning. The design studio is an open environment for the fostering of creativity and engagement in the design process, promoting exploration, innovation and intellectual advancement, and supporting a culture of critical inquiry, collaboration, community engagement, and stewardship among students, faculty and administration. For further details, refer to the TSA Student Handbook posted at:

<http://architecture.tulane.edu/current-students/student-information>

The TSA faculty strongly suggested that you get into the habit of working in the studio after class hours. Experience has shown that students who work in studio after class hours on a regular basis have a greater degree of success in the course because of the opportunity to discuss, clarify, and exchange ideas and methods with colleagues. A strong studio culture begins with the presence of students in the studio.

Academic Integrity:

The Code of Academic Conduct applies to all undergraduate students, the Unified Code of Graduate Student Academic Conduct applies to all graduate students in Tulane University. Tulane University expects and requires behavior compatible with its high standards of scholarship. By accepting admission, a student accepts its regulations (i.e., Code of Academic Conduct and Code of Student Conduct) and acknowledges the right of the university to take disciplinary action, including suspension or expulsion, for conduct judged unsatisfactory or disruptive. Learn more about Academic Honesty and Graduate Policies at Tulane here:

<https://college.tulane.edu/academic-honesty>

<https://ogps.tulane.edu/graduate-policies>

Civility in the Classroom:

All individuals and/or groups of the Tulane University community are expected to speak and act with scrupulous respect for the human dignity of others, both within the classroom and outside it, in social and recreational as well as academic activities. By accepting admission to Tulane University, a student accepts its regulations and acknowledges the right of the University to take disciplinary action, including suspension or expulsion, for conduct judged unsatisfactory or disruptive. For further information, refer to the code of student conduct on Tulane University website at: <https://conduct.tulane.edu/resources/code-student-conduct>

ADA Statement:

Any students with disabilities or other needs, who need special accommodations in this course, are invited to share these concerns or requests with the instructor and should contact Goldman Center for Student Accessibility: <http://accessibility.tulane.edu> or 504.862.8433 It is the policy and practice of Tulane University to comply with the Americans with Disabilities Act (Pub. L. No. 101-336), Section 504 of the Rehabilitation Act of 1973 (Pub. L. No. 93-112, § 504, as amended), and state and local requirements regarding individuals with disabilities. Students who seek accommodation are responsible for registering their disabilities with the Office of Disability Services (ODS) at the Center for Educational Resources and Counseling, requesting the specific accommodations they may need and providing adequate documentation that substantiates their disabilities and shows the need for the requested accommodations. For further details, refer to the Overview of Accommodations Procedures for Students with Disabilities on the Tulane University Goldman Center for Student Accessibility's website at: <https://accessibility.tulane.edu/>

TULANE ONE WAVE:

One Wave is a program at Tulane that aims to encourage a culture of safety and a community of engaged and proactive bystanders that do not tolerate any form of violence.

Tulane University recognizes the inherent dignity of all individuals and promotes respect for all people. As such, Tulane is committed to providing an environment free of all forms of discrimination including sexual and gender-based discrimina-

tion, harassment, and violence like sexual assault, intimate partner violence, and stalking. If you (or someone you know) has experienced or is experiencing these types of behaviors, know that you are not alone. Resources and support are available: you can learn more at titleix.tulane.edu. Any and all of your communications on these matters will be treated as either "Confidential" or "Private" as explained in the chart below. Please know that if you choose to confide in me I am mandated by the university to report to the Title IX Coordinator, as Tulane and I want to be sure you are connected with all the support the university can offer. You do not need to respond to outreach from the university if you do not want. You can also make a report yourself, including an anonymous report, through the form at tulane.edu/concerns.

Strictly Confidential	Mostly Confidential
Except in extreme circumstances, involving imminent danger to one's self or others, nothing will be shared without your explicit permission.	Conversations are kept as confidential as possible, but information is shared with key staff members so the University can offer resources and accommodations and take action if necessary for safety reasons.
Counseling & Psychological Services (CAPS) (504) 314-2277 or The Line (24/7) (504) 264-6074	Case Management & Victim Support Services (504) 314-2160 or srss@tulane.edu
Student Health Center (504) 865-5255	Tulane University Police (TUPD) Uptown: (504) 865-5911 Downtown: (504)988-5531
Sexual Aggression Peer Hotline and Education SAPHE Hotline (504) 654-9543	Title IX Coordinator (504) 865-5615 or msmith76@tulane.edu

Course Calendar (subject to change/adjustment)

Meeting	Date	Studio	Digi. Fab. Seminar	PCI Found. / Allied Ind. Support	TSA Events
Week 1					
1	08.27	1.1 Site Analysis			Classes begin
2	08.29		01.A Permea-scape 2D		
3	08.31				
Week 2					
	09.03	No Class - Labor Day Holiday			
4	09.05	1.1 Site Analysis Review	01.A Permea-scape 2D		All School Meeting
5	09.07	1.2 Site+Program Analysis		Site Visit w/ A. Chang (tentative)	
Week 3					
6	09.10				
7	09.12		01.B Permea-scape 3D	D. Eckenrode (PCI)	
8	09.14	1.2 Site+Program Analysis Review			
Week 4					
9	09.17	1.3 Site+Program+Precast Systems Analysis			
10	09.19	No Class - Yom Kippur			
11	09.21				
Week 5					
12	09.24				
13	09.26		01.C Permea-scape Fab.		
14	09.28	1.3 Site+Program+Precast Systems Analysis Review (conventional method issues identified)			
Week 6					
15	10.01	Site Design + Water Infrastructure Workshop		A. Chang	
16	10.03		01.C Permea-scape Fab.	Field trip to Gate/Tindle Precast Plant (tentative)	
17	10.05	1.4 Design Dev. w/ Adv. Fab. Tech.			
Week 7					
18	10.08				
	10.10		01.D Permea-scape Fab. Rev.		
	10.12	No Class - Fall Break			
Week 8					
19	10.15				
20	10.17		open for adjustments		
	10.19	1.4 Design Dev. w/ Adv. Fab. Tech. Mid-term Review		Batture (Civil)	Mid-term Grades Due
Week 9					
21	10.22	2.1 Adv. Fab. Tech. Dev. @ 1/8 scale			
22	10.24				
23	10.26				
Week 10					
24	10.29	2.2 Adv. Fab. Tech. Dev. @ 1/4 scale			
25	10.31				
26	11.02	Progress Review			
Week 11					
27	11.05	2.3 Adv. Fab. Tech. Dev. @ 1/2 scale			
28	11.07				
29	11.09	Progress Review			
Week 12					
30	11.12				
31	11.14				
32	11.16	Progress Review			
Week 13					
33	11.19	2.4 Adv. Fab. Tech. Dev. Review			
	11.21	No Class - Thanksgiving Holiday			
	11.23				
Week 14					
34	11.26	2.5 Research Summary / Review Prep.			
35	11.28	US Formliner Workshop	02 Formliner Demo	US Formliner	
36	11.30	Site Planning & Design Workshop		Batture, SMM, A. Chang	
Week 15					
	12.03	2.6 Mock Presentation			
Week 16					
	12.11	Options Studio Final Review			DOL Deadline:
	12.14	Studio Walk-through			
Week 17					
	12.20				Final Grades Due
Dec/Jan Spring		Winter Project Development - prep for full scale Full-scale Cast @ Gate Precast Plant (TBD) Presentation @ PCI Convention (March)			