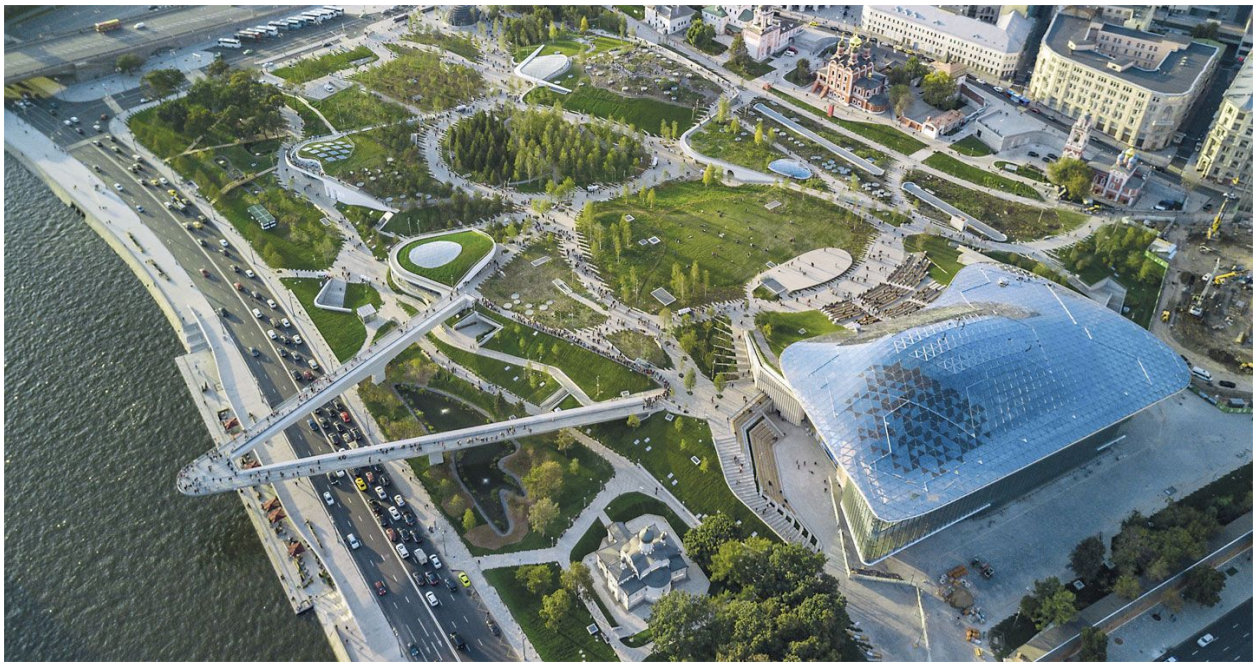
ARC 520E INTERMEDIATE DESIGN STUDIO II: ENVIRONMENTAL **Spring 2019**
MWF 1pm-6pm
Instructor: Jean-Pierre Trou, AIA
Office Location: To be assigned.
Office Hours: By appointment.
Email: J.Trou@austin.utexas.edu



ARCHITECTURE OF THE LANDSCAPE

The planet's climate is changing at an unprecedented rate, faster than at any point in modern civilization's history. Global temperatures will continue to rise by annual averages of 9°F (5°C) or more by the end of this century compared to preindustrial temperatures.[1] The effects of rising temperatures are evident in the reduction of glaciers, sea level rise, bleaching of coral reefs, storm surge, displacement of ecosystems, severe drought, more frequent wildfires, and more intense heat waves to name a few. These impacts are projected to intensify unless global emissions of greenhouse gases reduce dramatically.

Climate change is transforming the way we live and where we live, impacting our economy, our health, our quality of life and the natural systems that support us. In Texas alone, higher temperatures and increased frequency of heat waves, coupled with an escalation in population growth moving to the cities, will exacerbate the urban heat island effect in the cities, and consequently increase the number of heat-related incidents and deaths. Longer and hotter summers will grow the demand for cooling systems. Utility companies, city infrastructure and water resources will be under considerable strain. An increase in drought seasons, heat stress and wildfires are also expected from the increase in temperatures.

Along the Gulf Coast, relative sea level rise of twice the global average and warmer sea surface temperatures have contributed to higher storm surges and intensity of tropical storms in recent years. Hurricane Harvey, which made

[1] Jay, A., D.R. Reidmiller, C.W. Avery, D. Barrie, B.J. DeAngelo, A. Dave, M. Dzaugis, M. Kolian, K.L.M. Lewis, K. Reeves, and D. Winner, 2018: Overview. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 33–71. doi: 10.7930/NCA4.2018.CH1

landfall in Texas in August 2017, is one of the most costly natural disasters in US history, with an estimated cost of $125 billion—second only to Hurricane Katrina in the period of record, which had an approximate cost of $161 billion.[2] The recurrence of extreme precipitation will overload aging water resource infrastructure. Stormwater management systems, modeled after current codes and historical data, will not be able to sustain the constant future flash flooding events and eventually will collapse.

Coastal communities are starting to explore ways to make their cities and infrastructure more resilient and capable of adapting to the current and future risks of climate change. Resilience, adaptability and self regulation are all models found in nature. How can a desert beetle efficiently harvest its own water and survive in an incredibly harsh, arid environment? Biomimicry is learning from nature's forms and processes, then applying them to create innovative solutions. For example, the Darkling beetles could help us generate similar systems for collecting water for people in need from the drought. Looking at natural systems can help us find new strategies and solutions to mitigate the impact of climate change. As Michael Pawlyn says, "... ideas from Biology can lead to radical increases in resource efficiency, delivering the same function, but with a fraction of the resource input." We have an extensive resource library built over 3.8 billion years of research and development. After all, we are not the first ones that started to build. We can start by looking at buildings as living organisms capable of self-regulation and adaptation, and as a component of a larger ecosystem, the city. If we start looking at the city and the built environment as complex networks, working together, we can achieve greater impact with holistic approach to design - an architecture of the landscape rather than in the landscape. For example, a well-managed network of green infrastructure around the city working together with building green envelopes, can have a huge positive impact, especially if they create closed loops to reduce waste. Collectively, they can reduce the impact of sudden flash flooding, lessen the urban heat island effect, mitigate air pollution, reduce urban noise, and improve water management and water conservation as well as revamp biodiversity. Green envelopes reduce heat gain, increase the aesthetic quality of the city and contribute to the well-being. Nature can be a source of inspiration, mental regeneration and stress reduction. Research in Biophilic design suggests that people's connection to nature promotes healing, improves wellbeing and quality of life in the city.

This studio will focus on the relationship between humans and nature, architecture and landscape, and the symbiotic relationship between architecture and nature.

The following topics will constitute a central part of the studio:

- Architecture in/of the landscape
- The symbiotic relationship of architecture and landscape
- Biophilic design patterns & biological responses
- Biomimicry
- Green building envelopes
- Resilience
- Urban heat island effect
- Water quality management
- Water conservation
- Site analysis
- Code - Land Development Code, IBC2015, ADA

PREREQUISITES
ARC 320D, ARC/ARI 221K, and ARC 415K with a grade of at least C in each.

[2] https://www.coast.noaa.gov/states/fast-facts/hurricane-costs.html

CURRICULUM FLAG
This course carries the Independent Inquiry flag. Independent Inquiry courses are designed to engage students in the process of inquiry over the course of a semester, providing a student with the opportunity for independent investigation of a question, problem, or project related to the student's major. At least one-third of the grade will be based on independent investigation and presentation of one's own work.

INTERMEDIATE DESIGN STUDIO
Students pursuing the Bachelor of Architecture must complete four Intermediate Design Studios during their second and third years. Building on the Foundation Design Studios taken during the first year, the goal of the Intermediate Studios is to prepare students for Advanced Design Studios in their fourth and fifth years.

Each Intermediate Studio will be structured around one of four broad themes of inquiry (Operational, Environmental, Integration, and Speculation) and will offer a critical framework and vocabularies for design and development into key issues emphasized in the theme. Intermediate Studios will also serve as a platform to prepare students for the range of offerings of the Advanced Studios (e.g. Comprehensive, Urban Design, Landscape Architecture, etc.). Intermediate Studios will follow a similar structure, but each instructor will individually determine the scope and design problem for each studio.

THEME: ENVIRONMENTAL
This studio emphasizes architecture as a response to context: architecture and landscape architecture in the city and in nature, urban issues, housing, making place. This studio should take advantage that students are concurrently enrolled in or have already completed the course Site Design.

STUDIO STRUCTURE
Assignment #1 (P1): Research and Analysis (2 weeks)
15% of final grade
Students will work in teams

The first two weeks will be devoted to research, speculation and inquiry. Research and Analysis of Environment (site, place, context, design), a combination of class discussions and team research in green building envelopes and the use of biomimicry in architecture, and biophilic design. We will examine both the theory (readings listed below) and its application (projects) by studying precedents in an effort to provide a collective catalogue of information for reference for the entire studio. Teams will also design and develop a green envelope component. A section of a facade or roof system that will serve as both inspiration and reference for the next two projects.

Readings:

- Browning, W.D., Ryan, C.O., Clancy, J.O. (2014). *14 Patterns of Biophilic Design*. New York: Terrapin Bright Green llc.
- Arup. (2016). *Cities Alive: Green building Envelope*. Germany: GmbH.

Media: Photography, diagrams, drawings, models

Assignment #2 (P2): (2.5 weeks)
20% of final grade
Students will work in pairs

We will build upon the research from P1 and apply these concepts into a project. This assignment will explore architectural intervention in an open landscape and the relationship between the building and site. Students will visit the site and produce a series of site recordings: sketches, pattern recognition, diagrams, as part of a comprehensive site analysis. This study will inform the building placements and design direction.

Program: Water Conservation Awareness Center
Proposed Site: Lady Bird Johnson Wildflower Center
Project type: Pavilion
Media: Photography, diagrams, analog drawings, digital drawings, 3D renderings, models

Assignment #3: Main project (9 weeks)
65% of final grade
Students will work individually

The main project for this semester will be the design of a mid-rise, mixed-use project in Downtown Austin. We will bring the concept of an architecture of the landscape into the city context, examining how landscape and building become one in an urban setting. We will focus on reducing the heat island effect by using technologies studied during the semester and used in previous assignments. Students will visit the site and perform a due diligence study which will include code research. This study will inform the building parameters and design challenges.

Program: Micro Units, Retail + Restaurant
Proposed Site: Downtown Austin, Central Business District
Project type: Mixed-Use Commercial building
Media: Photography, diagrams, analog drawings, digital drawings, 3D renderings, models

LEARNING OUTCOMES
Students will be exposed to a series of learning goals several times and from different angles over the four Intermediate Studio sequence. The goal is that similar issues are repeated from studio to studio but from different angles, allowing students to find, within the diversity of the topics, a "common thread" as they go through the sequence of the four studios. The level of expectation will grow as students go from being introduced to an issue, to becoming competent at it. Some issues would be only mentioned in passing in one studio but will be studied in more depth in another.

- *Design Composition Skills*: Developed through three-dimensional architectural form and space, both exterior and interior; building envelope
- *Design Integration Skills*: Demonstrated through creative engagement with issues of materiality, structures, construction, and environmental system
- *Site Analysis and Design*: Developed through the creative engagement with relevant contextual; environmental and programmatic factors underlying the project.
- *Critical Thinking*: Quality of conceptual and critical thought; learning from precedents; research skills
- *Graphic Skills*: Quality of presentation; clarity of communication; appropriateness of media strategy and level of skill displayed
- *Collaborative and Leadership Skills*: Demonstrated through the active engagement in all activities of the studio
- *Code*: Understanding of basic code requirements for site development and buildings. FAR, impervious coverage, building coverage, setbacks, overlays, ADA and life safety (egress, fire access).

STUDIO CULTURE
The School of Architecture believes in the value of the design studio model. Studio learning encourages dialogue, collaboration, risk-taking, innovation, and learning-by-doing. The studio offers an environment where students can come together to ask questions and make proposals, which are developed and discussed among classmates, faculty, visiting professionals, and the public-at-large. Studio learning offers intensive one-on-one instruction from faculty members, and provides the opportunity for each student to develop his/her critical thinking skills and spatial

and material sensibilities. The design studio offers a synthetic form of education, where project-based learning becomes the foundation for developing an understanding of and commitment to the school's core values — broadmindedness, interconnectivity, professionalism, exploration and activism — all in service of architecture's fundamental mission: to improve the quality of the built and natural environments.
https://soa.utexas.edu/programs/architecture/architecture-studio-culture

DESIGN CONVERSATIONS: JESSEN LECTURES

The School of Architecture offers a wide range of opportunities for students to extend the design conversations taken place in studios (Lecture Series, Goldsmith Talks, Exhibitions, etc). Students are encouraged to participate and be engaged. Specifically, all B.Arch and BSAS students in studio are expected to attend all the Jessen Lectures (three per semester by lead practitioners from around the world). The lectures and the group discussions in studio that follow are important for the holistic education of intellectually engaged students and participation will have an impact on students' grades (see below).

Spring 2019 Lecture Series

Jan 28 Claire Agre
Feb 13 Deborah Berke / Jessen
Feb 20 Stih and Schnock
Feb 25 Joan Busquets
Mar 4 Michael Murphy / Jessen
Mar 11 ksestudio
Mar 27 William O'Brien
April 3 Elena Manferdini
May 1 Ana Maria Leon

Lecture Series begin at 5:00pm at Goldsmith Hall 3.120 or at Jessen Auditorium (as noted)

Michael Benedikt Foundation Studios Theory Talks

Jan 28 Lecture Zero: Metaphors and analogies in architecture
Feb 4 Lecture One: Biological: buildings as organisms
Feb 18 Lecture Two: Mechanical: buildings as machines
Feb 25 Lecture Three: Gastronomic: architecture as cuisine
Mar 4 Lecture Four: Semiotic: architecture as a language
Mar 25 Lecture Five: Geographical: buildings as landscapes
April 8 Lecture Six: Ontorelational: buildings as being(s).

All Foundation Studios Theory Talks are on Mondays 10:00-11:00 am at the main lecture hall.

EVALUATION CRITERIA

While each project contains certain quantifiable elements for evaluation, a significant portion of each grade is derived from broader and more subjective criteria.

Student work will be evaluated according to its rigor and evolution over the semester. Grades are subject to deductions for late arrivals, absences, and late or incomplete work at the discretion of the instructor.

Grading for an assignment is broken into four components, each of which is given roughly equal weight:

Pursuit: the consistent and rigorous development and testing of ideas.

- The ability to formulate a query or thesis and pursue a self-determined concomitant method of inquiry
- The ability to identify and implement various processual mechanisms (software, sketch drawing and models, etc.) in the development of the design
- Initiative as demonstrated in work ethic – Does the student do what is asked; go beyond what is asked; direct their own efforts; eager to produce the next iteration of the design?

Grasp: the ideas and understanding of the project at hand and integration of knowledge introduced in companion courses.

- A strong and clearly stated design objective
- Spatial acuity as demonstrated in plan – including reasonable disposition of programmatic elements – and sectional development
- Synthetic and critical thinking; the ability to holistically organize a project as demonstrated through creative engagement with issues of materiality, structures and construction, structural and environmental system integration, building materials and assembly, sustainable practices, etc. in support of the design objective
- Structural competence and material sensitivity as demonstrated in wall thickness, floor plates, and assembly

Resolution: of the design objective; the demonstration of competence, completeness, and finesse in the final design presentation.

- Quality of presentation; clarity of communication; appropriateness of media strategy and level of skill displayed through the work presented at all stages of the design process; technical documentation

Engagement: the active participation in studio activities, leadership, collaboration, group discussions and reviews.

A student must earn a letter grade of C or better in order for the course to count towards a degree in the School of Architecture and to progress in to the next studio. A letter grade of C- will not satisfy degree requirements.

GRADE DESCRIPTIONS

A/A- **Excellent**
Project surpasses expectations in terms of inventiveness, appropriateness, visual language, conceptual rigor, craft, and personal development. Student pursues concepts and techniques above and beyond what is discussed in class. Project is complete on all levels.

B+/B/B- **Above Average**
Project is thorough, well presented, diligently pursued, and successfully completed. Student pursues ideas and suggestions presented in class and puts in effort to resolve required projects. Project is complete on all levels and demonstrates potential for excellence.

C+/C **Average**
Project meets the minimum requirements. Suggestions made in class and not pursued with dedication and rigor. Project is incomplete in one or more areas.

C-/D+/D/D- **Poor**
Project is incomplete. Basic grasp of skill is lacking, visual clarity or logic of presentation are not level-appropriate. Student does not demonstrate the required competence and knowledge base.

F **Fail**
Project is unresolved. Minimum objectives are not met. Performance is not acceptable. Note that this grade will be assigned when students have excessive unexcused absences.

X **Excused Incomplete**

Can be given only for legitimate reasons of illness or family emergency. Simply not completing work on time is not an adequate cause for assigning this evaluation. It may only be used after consultation with the Associate Deans' offices and with an agreement as to a new completion date. Work must be completed before the second week of the next semester in which the student is enrolling, according to the School of Architecture policy.

ATTENDANCE

Punctual and regular attendance is mandatory. Participation is expected. With three (3) unexcused absences, the student's final grade for the course will be lowered by a full letter grade. The final grade will be lowered by a full letter grade for each unexcused absence thereafter. Aside from religious observances, absences are only excused with written documentation of a medical issue or family emergency. The student is responsible for completing work missed due to excused absences and initiating communication with the instructor to determine due dates.

If a student is late (5 minutes after the start of class) three (3) times, it will be counted as one (1) unexcused absence. Students should notify the instructor prior to class if lateness or absence is known in advance. Students must notify instructors directly regarding lateness or absences; Asking a classmate to inform the instructor is not acceptable.

RELIGIOUS OBSERVANCES

A student shall be excused from attending classes of other required activities, including examinations, for the observance of a religious holy day, including travel for the purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence. University policy requires students to notify each of their instructors as far in advance of the absence as possible so that arrangements can be made.

By UT Austin policy, you must notify the instructor of the pending absence at least fourteen days prior to the date of a religious holy day. If you must miss a class, an examination, an assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.

ACADEMIC INTEGRITY

Students who violate University policy on academic integrity are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on academic integrity will be strictly enforced. Refer to the Student Conduct and Academic Integrity website for official University policies and procedures on academic integrity: http://deanofstudents.utexas.edu/conduct/academicintegrity.php. University Code of Conduct: http://catalog.utexas.edu/general-information/the-university/#universitycodeofconduct

MENTAL HEALTH AND SUPPORT SERVICES

Taking care of your general well-being is an important step in being a successful student. If stress, test anxiety, racing thoughts, feeling unmotivated, or anything else is getting in your way, there are options available for help:

- In-house CARE counselor (see below)
- For immediate support
    - Visit/call the Counseling and Mental Health Center (CMHC):
      M-F 8am-5pm | SSB, 5th floor | 512-471-3515 | cmhc.utexas.edu
    - CMHC Crisis Line:
      24/7 | 512-471-2255 | cmhc.utexas.edu/24hourcounseling.html
- Free services at CMHC:
    - Brief assessments and referral services: cmhc.utexas.edu/gettingstarted.html

- Mental health & wellness articles: cmhc.utexas.edu/commonconcerns.html
- MindBody Lab: cmhc.utexas.edu/mindbodylab.html
- Classes, workshops, and groups: cmhc.utexas.edu/groups.html

CARE PROGRAM

Counselors in Academic Residence (CARE) Program places licensed mental health professionals within the colleges or schools they serve in order to provide better access to mental health support for students who are struggling emotionally and/or academically.

Abby Simpson (LCSW) is the assigned CARE counselor for the School of Architecture. Faculty and staff may refer students to the CARE counselor or students may directly reach out to her. Please leave a message if she is unavailable by phone.

Abby Simpson, LCSW | BTL 114B | 512-471-3115 (M-F 8am-5pm)
https://cmhc.utexas.edu/CARE_simpson.html

STUDENTS WITH DISABILITIES

Students with disabilities who require special accommodations must obtain a letter that documents the disability from the Services for Students with Disabilities area of the Office of the Dean of Students (471-6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). This letter should be presented to the instructor in each course at the beginning of the semester and accommodations needed should be discussed at that time.
http://diversity.utexas.edu/disability/

SECURITY, SAFETY, AND SUSTAINABILITY

The studio is an exceptional learning environment. Since it is a place for all, it necessitates the careful attention to the needs of everyone. All spraying of fixative, spray paint, or any other substance should be done in the shop. Security is a necessary component for a studio that is accessible to you and your colleagues 24 hours a day, 7 days a week. Do not leave your studio without your studio key and do not leave your studio unlocked. Hold yourself and your studiomates accountable for the security of your shared space.

The studio is an opportunity to apply sustainability principles, being mindful to recycle and reuse to reduce material consumption at UTSOA. Recyclable materials should be placed in blue bins or any other containers with white bags. The Material Exchange, a give-and-take system for students to donate materials and take what they need for studio and fabrication coursework, is available throughout the semester to all UT students in the UTSOA Technology Lab. All unwanted, reusable materials should be brought to the Material Exchange station in the Technology Lab at the end of the semester.

BCAL

Concerns regarding the safety or behavior of fellow students, Teaching Assistants (TA), or Professors can be reported to the Behavior Concerns Advice Line (BCAL): 512-232-5050. Calls can be made anonymously. If something doesn't feel right, it probably isn't. Trust your instincts and share your concerns.

EMERGENCY EVACUATION

In the case of emergency evacuation:

- Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.
- Students should familiarize themselves with all exit doors of each classroom and building they may occupy. Remember that the nearest exit door may not be the one used when entering the building.
- Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class. In the event of an evacuation, follow the instruction of faculty or class instructors.

- Reentry into a building is prohibited unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services offices.

Information regarding emergency evacuation routes and emergency procedures can be found at: www.utexas.edu/emergency.

RECOMMENDED MATERIALS

Readings:

- Browning, W.D., Ryan, C.O., Clancy, J.O. (2014). *14 Patterns of Biophilic Design*. New York: Terrapin Bright Green llc.
- Arup. (2016). *Cities Alive: Green building Envelope*. Germany: GmbH.
- Kellert, S. and Calabrese, E. (2015). *The Practice of Biophilic Design*. www.biophilic-design.com
- Benyus, J.M. (2002) *Biomimicry.* New York, NY: Harper Perennial.

NCA 2018 Report:

- https://nca2018.globalchange.gov

Videos:

- https://www.ted.com/talks/michael_pawlyn_using_nature_s_genius_in_architecture?language=en
- https://www.architectmagazine.com/videos/resilience-for-the-long-haul
- https://www.bloomberg.com/news/videos/2016-06-02/bloomberg-businessweek-design-2016-janine-benyus

SCHEDULE

Spring 2019

	M		**W**		**F**	
Week 1			01/23	Studio Lottery. **P1 Assignment - Research and Analysis.**	01/25	Overview of P1 and Group selection. Discussion of readings.
Week 2	01/28	**Lecture Zero: Metaphors and Analogies in Architecture.* Class discussion. *Lecture: Claire Agre*	01/30	Group research and analysis critique	02/01	Group envelope component critique
Week 3	02/04	**Lecture One: Biological: Buildings as Organisms.*	02/06		02/08	**P1 Due - Studio Pin Up**. Groups presentation. **P2 Assignment - Water Conservation Awareness Center.**
Week 4	02/11	Site Visit - Lady Bird Johnson Wildflower Center	02/13	*Lecture: Deborah Berke / Jessen*	02/15	

Week 5	02/18	**Lecture Two: Mechanical: Buildings as Machines.*	02/20	*Lecture: Stih and Schnock* **Pin Up - Critique**	02/22	
Week 6	02/25	**Lecture Three: Gastronomic: Architecture as Cuisine.* *Lecture: Joan Busquets*	02/17	***P2 Due - Studio Pin Up.*** ***P3 Assignment - Green Mixed-Use Development***	03/01	Site Visit - Downtown
Week 7	03/04	**Lecture Four: Semiotic: Architecture as a Language.* *Lecture: Michael Murphy / Jessen*	03/06		03/08	
Week 8	03/11	*Lecture: ksestudio*	03/13		03/15	
Week 9	03/18	Spring break.	03/20	Spring break.	03/22	Spring break.
Week 10	03/25	**Lecture Five: Geographical: Buildings as Landscapes.*	03/27	*Lecture: William O'Brien*	03/29	**Pin Up - Critique**
Week 11	04/01		04/03	*Lecture: Elena Manferdini*	04/05	
Week 12	04/08	**Lecture Six: Ontorelational: buildings as being(s).*	04/10		04/12	
Week 13	04/15		04/17		04/19	

Week 14	04/22		04/24	**Pin Up - Critique**	04/26	
Week 15	04/29		05/01	*Lecture: Ana Maria Leon*	05/03	
Week 16	05/06		05/08	**Potential Final review**	05/10	Potential Final review

Lectures begin at 5:00pm at Goldsmith Hall 3.120 or at Jessen Auditorium (as noted)
*All Michael Benedikt Foundation Studios Theory Talks are on Mondays 10:00-11:00 am at the main lecture hall.