RESPONSIVE SYSTEMS

Landscape Architecture Advanced Topics Studio
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ARCH 5002 - Architectural Design Concentration

Fall 2011

Faculty
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Course Catalogue Description (ARCH 5002)
Emphasis on architectural problems developed around faculty expertise and emerging opportunities in the profession.

Schedule and Location
M,W,F 1:40pm-5:30pm
Room 226 Design Building

Course Description
Advances in technology have drastically altered traditional methods of analysis, construction, representation, and collaboration. Architects and designers address dynamic architectural elements and temporal landscapes through computational devices that are responsive to humans and ephemeral environmental stimuli. The paradigm shift in architectural and environmental design from the static to the dynamic requires designers to understand how responsive objects and systems function within larger ecological fields. This advanced topic studio explores the role of the designer and their ability to develop responsive architectural and landscape systems.
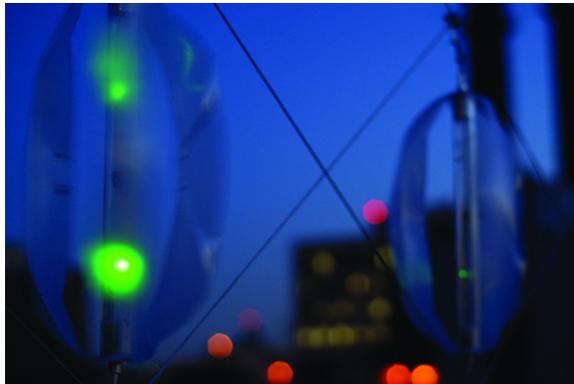
Howeler + Yoon
Windscreen
2011
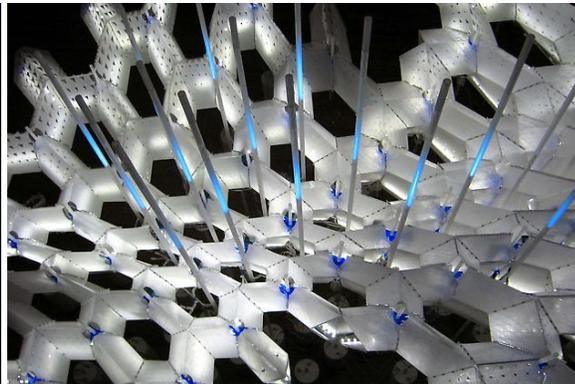
Future Cities Lab
Aurora
2009

Students will be asked to research sensing devices, diagram and map site related and real-time data, develop working prototypes, develop case studies, research nascent technologies and propose speculative architectural and landscape scenarios. The studio will engage a range of sites throughout Louisiana, including the rural landscape of the Atchafalaya Basin and the urban setting of New Orleans, with each design team focusing on one particular site. Students will be challenged to speculate on how new responsive interventions could be used to enhance and reinvigorate the sites. The studio will entertain

a broad range of approaches organized around concepts of emergence, object orientation, self-organization, and cultural/social expression.

The studio will be divided into two phases. *Phase 01* will begin by engaging the students in an Advanced Architecture Contest/International Competition. The aim of the competition is to generate ideas, proposals, and visions of possible scenarios for what the habitat and the city of the 21st century can be. The competition calls for entries that research and demonstrate the impact that real-time data collection might have on sensor-driven habitats and cities. Students will continue to develop their proposals in *Phase 02* of the semester. Participating in digitally focused workshops, students will be expected to continue to advance their design and computational skills by completing a series of tutorials and applying this knowledge to their projects. Responsive and interactive components and prototypes will be developed through digital and physical models. Employing a bottom-up approach to design, these components and prototypes will be developed into architectural and landscape systems. It will be up to each team to determine the exact scale, scope, and programmatic implications of the project.

Studio Objectives

- To identify and research sensing devices and classify the various information, data, and phenomena that that they are capable of capturing and recording. To speculate and demonstrate how this information can be implemented to affect architectural and landscape ecologies.
- To identify and research the theoretical, conceptual and pragmatic applications of data-driven, interactive and responsive systems and their potential impact on the design of architectural and landscape systems.
- To compare and distinguish the difference between top-down and bottom-up approaches to design. To formulate and design a bottom-up system which demonstrates self-organizing and performative attributes. To describe how this approach to design affects the design process, workflow, and outcome of an architectural and landscape system.
- To recognize and differentiate the potential applications for digital design procedures and their integration into the design process and design project.
- To utilize time as a design attribute.
- To design and develop architecture and landscape architecture projects that are systematic, performative and responsive to the environment and context of Louisiana.

Studio Outcomes

- Students will understand potential applications for sensor driven devices and digital technology to impact and enhance architecture and landscape environments.
- Students will develop a series of working prototypes that demonstrate interactive relationships and responsive behaviors
- Students will generate digital and physical models that explore the proliferation of their prototypes into performative and responsive architectural and landscape system situated within a specific contextual condition.
- Students will be able to define parametric and algorithmic processes and explain how these processes are incorporated and integral to their design projects.
- Students will generate time based representations to communicate analytical and visual information pertaining to their architectural and landscape designs.

Interdisciplinary Collaboration

"In the highly digitized age of the 21st century, architecture has become so thoroughly enmeshed within a network of other disciplines that what we are witnessing are new hybrid, mutant forms of practice that serve to reinvent the discourse of architecture as we know it."
Neil Leach
AD: Digital Cities

This studio will operate as a joint studio, collaborating with Professor Brad Cantrell and students from LSU's Robert Reich School of Landscape Architecture. The studio is intended to foster an interdisciplinary design environment that seeks and promotes innovation and the generation of new ideas. Students will work in interdisciplinary teams during the various research and design phases of the project, working collaboratively in the same studio environment for the duration of the semester.

Travel
Each student in this studio will have the opportunity to participate in an optional field trip this semester. The studio will be traveling to San Francisco, California to visit and meet with architecture and design firms working at the forefront of responsive and interactive systems. We will also visit some historic and recent works of architecture in San Francisco, including Herzog and deMeuron's deYoung Museum, Renzo Piano's California Academy of Sciences, and Morphosis Architect's Federal Building. It is preferable to travel as early in the semester as possible. For those students who wish to take this studio, please begin to inquire about flight and hotel information as soon as possible. The approximate airfare from New Orleans to San Francisco currently ranges from $300-$400. The proposed travel dates are from August 31 through September 03. Students are responsible for their own travel arrangements and accommodations. Please do not purchase your tickets or hotel accommodations until we meet and I have completely confirmed this trip.

Digital Environments
The studio will focus on the use and implementation of various digital technologies, including algorithmic design environments. Students are not required to have a background or experience with the following platforms, as a series of tutorials and workshops will be provided in studio. However, students will be expected to be fully engaged and proactive in their research and development with the following platforms: Processing, Arduino, Rhino, Grasshopper, and Firefly.

Course Schedule (Tentative)

Week 01
08.22.11   Phase 01: Competition Project 01 Brief / Research: Sensor Types

Week 02
08.29.11   Phase 01: Research: Diagramming and Mapping Site Data / Travel Option

Week 03
09.05.11   Phase 01: Labor Day Holiday / Competition Project Schematic Design

Week 04
09.12.11   Phase 01: Competition Project Design Development

Week 05
09.19.11   Phase 01: Competition Project Presentation: Formatting and Preparation

Week 06
09.26.11   Phase 01: Competition Project Submission

Week 07
10.03.11   Phase 02: Project 02 Brief / Digital Workshops + Tutorials

Week 08
10.10.11   Phase 02: Project 02 Schematic Design / Component + Prototype Development

Week 09
10.17.11   Phase 02: Project 02 Schematic Design Review / Component + Prototype Development

| Week 10 | Phase 02: Project 02 Design Development / Initial System Development |
| 10.24.11 | |

| Week 11 | Phase 02: Project 02 Mid Project Review |
| 10.31.11 | |

| Week 12 | Phase 02: Project 02 Design Development / Responsive System |
| 11.07.11 | |

| Week 13 | Phase 02: Project 02 Design Development / Responsive System |
| 11.14.11 | |

| Week 14 | Thanksgiving Holiday |
| 11.21.11 | |

| Week 15 | Phase 02: Project 02 Presentation Formatting and Preparation |
| 11.28.11 | |

| Week 16 | Phase 02: Project 02 Final Review |
| 12.05.11 | |

*Note: Schedule is subject to change.

Grading-Evaluation
Course grades will be evaluated on the following criteria:

Each assignment will be graded on an individual basis. Grading criteria for each assignment will be explained in its corresponding handout. No late assignments will be accepted.

A = 90 -100   Distinguished mastery of the course material
B = 80-89   Good mastery of the course material
C = 70-79   Average mastery of course material
D = 50-69   Minimally acceptable achievement
E = 0-49   Failing

Professionalism
Professionalism includes class attendance, class participation, class etiquette and ability to work well with others on team-based assignments.

Attendance
Attendance is mandatory during the entire scheduled class time for all classes. If you miss class three times (unexcused absences), this could result in attendance probation (see *Attendance* Regulations in the LSU General Catalog). If you find it necessary to miss class, you assume responsibility for making up examinations, obtaining lecture notes, and otherwise compensating for what may have been missed. The course instructor will determine the validity of a student's reason(s) for absences and will assist those students who have valid reasons. You are responsible for providing reasonable advanced notification and appropriate documentation of the reason for the absence.

Individuals Needing Accommodations
Any student needing special accommodations due to a disability must inform the instructor at the start of the semester and mutually develop an accessibility plan.

Academic Honesty
Regarding ethics; cheating, plagiarism, and academic dishonesty of any kind will not be tolerated. Any act of cheating or plagiarism could result in academic probation. Students found guilty of academic dishonesty, as defined in the Code of Student Conduct (rev. March 1990), will receive appropriate disciplinary action.

Class Etiquette
Students are expected to conduct themselves in a mature, respectful, and responsible manner during class sessions. No cell phone or audio device use is allowed during class hours. Use of computers during class

hours should be focused on class work only. Please be respectful of your colleague's space and personal items.

Readings

Processing:

Reas, Casey, Ben Fry. *Processing: A Programming Handbook for Visual Designers and Artists.* Cambridge, MA: MIT Press, 2007.

Terzidis, Kostas. *Algorithms for Visual Design Using the Processing Language.* Indianapolis, IN: Wiley Publishing, Inc., 2009.

Noble, Joshua. *Programming Interactivity: A Designer's Guide to Processing, Arduino, and openFrameworks.* Sebastopol, CA: O'Reilly Media, Inc., 2009.

Kinetic Architecture:

Beesley, Philip. *Kinetic Architectures & Geotextile Installations.* Ontario, Canada: Riverside Architectural Press, 2007, 2010.

Beesley, Philip. *Hylozoic Ground: Liminal Responsive Architecture.* Ontario, Canada: Riverside Architectural Press, 2007, 2010.