

Senior Research Studio in Architecture

EVDA 782.6 F(0-16)

Vera Parlac, vera.parlac@ucalgary.ca
TA: TBA

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Responsive Architecture

Introduction:

Senior Research Studio in Architecture is a research design studio in which students collaborate with design faculty in exploring projects that engage contemporary issues defining the built and natural environments. Students choose topics outlined by faculty research expertise.

EVDA 782.6 Section of the Senior Research Studio in Architecture will focus on responsive architecture and will explore a territory beyond the stasis in architecture. The aim to explore responsive and adaptive (building) systems is grounded in a position that the built world should operate synergistically within larger ecologies. And in return the responsive building systems could act as ecologies in themselves. This approach positions architectural design as a discipline that creates built ecologies. It also enables the architectural discipline to pursue its participation in larger systems (larger ecologies) as an opportunity to establish a more intelligent and operative architectural participation – a more sustainable participation.

Objectives:

1. To expand the understanding of the responsive and adaptive systems and their role in architecture and built ecologies.
2. To engage, through design, the opportunities that the adaptive and dynamic systems bring into architecture.
3. To engage broader social, technological and ecological issues triggered by the deployment of responsive and dynamic systems.
4. Exposure to the fundamental knowledge in mechatronics and imbedded systems.

Skills/Knowledge: Arduino platform, mechatronics, robotics, prototyping, applied design, design process.

Teaching Approach:

In this design studio course students are expected to develop their design project in response to a design studio brief articulated by the instructor. Student projects will be discussed during desk crits, informal and formal reviews. Short lectures will be given throughout the semester, and discussions of various issues arising from the project will be conducted. Technical workshop will be offered to familiarize students with Arduino platform, sensors and imbedded systems. Technical help will be provided throughout the semester by a teaching assistant from electrical engineering. The emphasis will be placed on creating a speculative yet rigorous environment for creative exploration.

Content:

As the external socio-economic, cultural, and technological context changes, so do conceptions of space, shape, form and performance in architecture. Over the past decade, we have seen an

increasing interest in exploring the capacity of built spaces to respond dynamically to changes in the external and internal environments. The idea that two-way relationships could be established among the space/component/surface, the environment, and the users is not new. The first concepts of an adaptive, responsive architecture were born in the late 1960s and early 1970s, primarily as a result of parallel developments in cybernetics, artificial intelligence, and information technologies. This studio is interested in the territory where the cybernetics and architecture meet. New digital technologies of modeling, fabrication and simulation, new materials and material technologies, and responsive architecture informed by mechatronics and robotics have an extensive impact on the way we build and imagine architecture. Responsive Architecture studio reflects the importance of those new technologies in contemporary design.

Evaluation:

The course evaluation will be based on assignments completed during the term, which includes a development of an architectural proposal in two phases. The projects are evaluated based on the following criteria:

1. Focus (20% of the grade) – ability to articulate Idea/Focus/Agenda/Position, and state it with conviction, clarity and intent.
2. Support (30% of the grade) – ability for design thinking through generative drawings and models that explain, support and document design proposal development/ process.
3. Structure (20% of the grade) – ability to relate disparate design information to his/her design position and develop design proposal.
4. Documentation (30% of the grade) – The project is clearly represented through necessary drawings and models

Architectural proposal phase I	40%
Architectural proposal phase II	60%

The EVDS standard grading scale will be used in all evaluations for this course.

A+ (92.5-100), A (85-92.49), A- (80-84.99), B+ (76-79.99), B (73-75.99), B- (70-72.99), C+ (66-69.99), C (63-65.99), C- (60-62.99), D+ (56-59.99), D (50-55.99), F (0-49.99)

Readings:

Books:

Kas Oosterhuis, *Hyperbody*

Michael Weinstock, *The Architecture of Emergence*

Beesley Philip, *Responsive Architectures: Subtle Technologies 2006*

Saarah Bonnemaïson and Christine Macy, *Responsive Textile Environments*

David Benjamin + Soon-in Yang, *Life Size*

Michael Fox and Miles Kemp, *Interactive Architecture*

Robert Kronenburg, *Flexible: Architecture that Responds to Change*

Bullivant Lucy, *4dsocial: Interactive Design Environments*

Web Sources:

http://www.ted.com/talks/rachel_armstrong_architecture_that_repairs_itself.html

http://www.youtube.com/watch?v=Vps__XdjZTk

<http://www.youtube.com/watch?v=kXPWih97w-4&NR=1>

<http://www.youtube.com/watch?v=gNEILvRqQ5w&NR=1>

<http://www.youtube.com/watch?v=SDInSy2C2NA>

<http://www.thelivingnewyork.com/>

<http://caad-eap.blogspot.com/>

http://www.sciarc.edu/sciarc_player.html?vid=http://www.sciarclive.com/Lectures/2010_09_29_DavidBenjamin.flv&title=David Benjamin

Other texts might be suggested throughout the semester

Special Budgetary Requirements:

EVDA 782 - Senior Arch. Studio (all sections) \$25.00

Notes:

1. Written work, term assignments and other course related work may only be submitted by e-mail if prior permission to do so has been obtained from the course instructor.
2. It is the student's responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at 220-8237. Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than fourteen (14) days after the start of this course.
3. Plagiarism - Plagiarism involves submitting or presenting work in a course as if it were the student's own work done expressly for that particular course when, in fact, it is not. Most commonly plagiarism exists when:(a) the work submitted or presented was done, in whole or in part, by an individual other than the one submitting or presenting the work (this includes having another impersonate the student or otherwise substituting the work of another for one's own in an examination or test),(b) parts of the work are taken from another source without reference to the original author,(c) the whole work (e.g., an essay) is copied from another source, and/or,(d) a student submits or presents work in one course which has also been submitted in another course(although it may be completely original with that student) without the knowledge of or prior agreement of the instructor involved. While it is recognized that scholarly work often involves reference to the ideas, data and conclusions of other scholars, intellectual honesty requires that such references be explicitly and clearly noted. Plagiarism is an extremely serious academic offence. It is recognized that clause (d) does not prevent a graduate student incorporating work previously done by him or her in a thesis. Any suspicion of plagiarism will be reported to the Dean, and dealt with as per the regulations in the University of Calgary Graduate Calendar.