Responsive Architecture Elective
Philip Beesley
May 1, 2022

Waterloo Architecture
ARC 570 Responsive Architecture: Emerging readings within architecture and organicism
 Wednesday morning from 9:30 – 12:20, ONLINE via Zoom
 Philip Beesley

Territorial Acknowledgement
We acknowledge that the School of Architecture is located on the traditional territory of the Neutral, Anishinaabeg and Haudenosaunee peoples. The University is situated on the Haldimand Tract, the land promised to the Six Nations that includes 10 kilometres on each side of the Grand River. (see references here:
https://uwaterloo.ca/engineering/about/territorial-acknowledgement)

Course Description
Can architecture integrate living functions? This course focuses on the rapidly emerging interdisciplinary field of responsive architecture, using combinations of seminar readings and in-class drawing and diagramming exercises in order to provide a substantial body of reference material. Seminars will form one of the cores of the course focused on specialized topics produced by students working as pairs and individuals. A primary activity will be round-table discussions where we reflect on material together, exploring implications through discussion and workshop exercises. Drawing and diagramming exercises conducted within the class will build from primary geometry and explore relationships within complex systems. Individual summary readings would be developed throughout the term, supporting a final assignment in which readings are brought together into a unified catalogue, offering a valuable reference for future individual research.

This seminar course will offer a series of readings and explorations of late 19th and 20th century cultural origins and specialized aspects of responsive, interactive architecture. Readings will include tangible explorations including natural growth, spatial and cybernetic organizations and study of paradigms and underlying principles. The survey offered by these readings can provide terms of reference for designing with complex interdependent systems.

The theories of Ilya Prigogine, the great 20th century physicist, proposed a set of paradigms that seem to dramatically contrast with core assumptions that have guided western architecture. Seemingly opposing the conventions of stable, classical western architecture, Prigogine proposed diffusion and dissipation as key terms for understanding how materials could interact in a dynamic, constantly evolving and self-organizing world. These terms relate to a general search for fundamental origins of living systems. Framed within a general exploration of interactive architecture and of 'abiogenesis', the transition between inorganic and organic life forms, we will follow a set of readings and design explorations related to the dynamic form-languages and interacting systems implied by Prigogine's theories. These studies imply emerging paradigms for design.

The seminar will be conducted as a series of readings led by students throughout the term, alternating with professor-led readings and presentations. Material from the Living Architecture Systems Group LASG) group will be included. Critique and extension of the themes embodied in LAS installations will be invited. The varying topics within the seminar course can be refined in order to directly relate to individual thesis investigations, providing material for integration. Practical technology and expressive formal design can be included within the investigations of the participants.

A final assignment will ask each seminar student to frame a comprehensive catalogue of readings that includes the range of material presented during the class, supplemented by material relevant to each student's individual interests.

During the seminar, each student will be asked to produce the following:

Assignment One: Seminar presentation produced by individual or paired students, accompanied by summary notes composed as a reference hand-out. 60% of final grade, evaluated for conceptual depth, ambition, and quality of presentation. Include a summary hand-out for the class. Submit your presentation on LEARN as a formal assignment submission. Share your presentation in the form of a .pdf on Basecamp for all-class reference.

Assignment Two: Catalogue of readings with brief essay that comments and expands on at least two of the reading topics. 30% of final grade, evaluated for quality of catalogue including

summary and integration of evolving ideas. Present your work in a short summary using Miro. Submit your cataloge on LEARN as a formal assignment submission.

Participation: 10% of the final grade will be assigned for class participation, evaluated for consistency of attendance and contributions to the group within discussions.

Topics & Schedule
Note: the specific readings and topics may be adjusted to reflect interest and development during the course. Links will be provided for each reading.

1. May 3
   Introduction
2. May 11
   Introduction 2
3. May 18
   Seminar A: Haeckel, Froebel, Kindergarten
4. May 25
   Seminar B: Vernadsky and de Chardin: Biosphere and Noosphere
5. June 1
   Seminar C: Origin of Life, Schrodinger, What is Life?; Genetic Takeover, Graham Cairns-Smith
6. June 8
   Seminar D: Edges of Surrealism, Rogier Caillois and Georges Bataille
7. June 15
   Seminar E: Prigogine and Dissipative Structures
8. June 22
   Seminar F: Alan Turing and Gordon Pask
9. June 29
   Seminar G: Nicholas Negroponte Soft Architecture Machines
10. July 6
    Seminar H: Larry Busbea, The Responsive Environment
11. July 13
    Seminar I: Nicholas de Monchaux, Space Suit
12. July 20

Final Presentations, Assignment 2: Catalogue

Course Delivery Platforms & Communication

https://us02web.zoom.us/j/84282387266?pwd=bU1TSnY2b2ZKUHRrSnRoSDM0elBOZz09

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https://miro.com/app/board/uXjVOY50Yc0=/?invite_link_id=520821009351

Governing Principles
COVID-19 Special Statement
Given the continuously evolving situation around COVID-19, students are to refer to the University of Waterloo's developing information resource page (https://uwaterloo.ca/coronavirus/) for up-to-date information on academic updates, health services, important dates, co-op, accommodation rules and other university level responses to COVID-19.
As we pivot to remote teaching to start the term, instructors may need to record lectures. In this case, the course's official *Notice of Recording* document will be found on the course's LEARN site. This document outlines shared responsibilities for instructors and students around issues of privacy and security. Each student is responsible for reviewing this document.

 Fair Contingencies for Emergency Remote Teaching
 We are facing unusual and challenging times. The course outline presents the instructor's intentions for course assessments, their weights, and due dates in Winter 2022. As best as possible, we will keep to the specified assessments, weights, and dates. To provide contingency for unforeseen circumstances, the instructor reserves the right to modify course topics and/or assessments and/or weight and/or deadlines with due and fair notice to students. In the event of such challenges, the instructor will work with the Department/Faculty to find reasonable and fair solutions that respect rights and workloads of students, staff, and faculty.

Late Work
Submit your work on time. Late work would be penalized at 5% per day.

Only in the case of a justified medical or personal reason will these penalties be waived, and only if these have been officially submitted to the Undergraduate Student Services Co-Ordinator and accepted by the Undergraduate Office.

Students seeking accommodations due to COVID-19, are to follow Covid-19-related accommodations as outlined by the university here: (https://uwaterloo.ca/coronavirus/academic-information#accommodations).

Passing Grades
The standard minimum passing grade in each ARCH course is 50% with the following exceptions: the minimum passing grade is 60% for all studio courses (ARCH 192, ARCH 193, ARCH 292, ARCH 293, ARCH 392, ARCH 393, ARCH 492, and ARCH 493). Grades below the specified passing grade result in a course failure.

Mental Health Support
All of us need a support system. We encourage you to seek out mental health supports when they are needed. Please reach out to Campus Wellness (https://uwaterloo.ca/campus-wellness/) and Counselling Services (https://uwaterloo.ca/campus-wellness/counselling-services).
We understand that these circumstances can be troubling, and you may need to speak with someone for emotional support. Good2Talk (https://good2talk.ca/) is a post-secondary student helpline based in Ontario, Canada that is available to all students.

Equity, Diversity and Inclusion Commitment
The School of Architecture is committed to foster and support equity, diversity and inclusion. If you experience discrimination, micro-aggression, or other forms of racism, sexism, discrimination against 2SLGBTQ+, or disability, there are several pathways available for addressing this:
A) If you feel comfortable bringing this up directly with the faculty, staff or student who has said or done something offensive, we invite you, or a friend, to speak directly with this person. People make mistakes and dealing them directly in the present may be the most effective means of addressing the issue.

B) you can reach out to either the Undergraduate office, Graduate office, or Director (Anne Bordeleau).If you contact any of these people in confidence, they are bound to preserve your anonymity and follow up on your report.

C) You can choose to report centrally to the Equity Office. The Equity Office can be reached by emailing equity@uwaterloo.ca. More information on the functions and services of the equity office can be found here: https://uwaterloo.ca/human-rights-equity-inclusion/about/equity-office.

D) Racial Advocacy for Inclusion, Solidarity and Equity (RAISE) is a student-led Waterloo Undergraduate Student Association (WUSA) service launching in the Winter 2019 term. RAISE serves to address racism and xenophobia on the University of Waterloo campus with initiatives reflective of RAISE's three pillars of Education and Advocacy, Peer-to-Peer Support, and Community Building. The initiatives include but are not limited to: formal means to report and confront racism, accessible and considerate peer-support, and organization of social events to cultivate both an uplifting and united community. You can report an incident using their online form.

Academic integrity, grievance, discipline, appeals and note for students with disabilities:
Academic integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check the Office of Academic Integrity for more information.]
Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4. When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.
Discipline: A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for his/her actions. [Check the Office of Academic Integrity for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline. For typical penalties, check Guidelines for the Assessment of Penalties.

Appeals: A decision made or penalty imposed under [Policy 70, Student Petitions and Grievances](#) (other than a petition) or [Policy 71, Student Discipline](#) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to [Policy 72, Student Appeals](#).

Note for students with disabilities: [AccessAbility Services](#), located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with [AccessAbility Services](#) at the beginning of each academic term.

Turnitin.com: Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin in this course. It is the responsibility of the student to notify the instructor if they, in the first week of term or at the time assignment details are provided, wish to submit the alternate assignment.