ARCH 4604, ARCH 5604 // COMPUTATIONAL METHODS
Fall 2018

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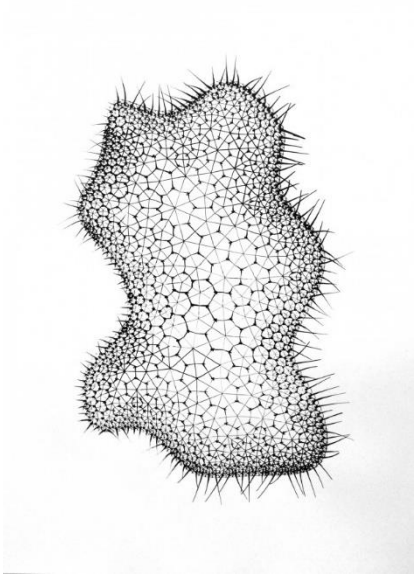

PREMISE

From algorithmic design to open source and from virtual reality to robotics, many designers are seeking new tools to explore formal and functional properties as sources of ordering systems. This is an introductory course which focuses on computational techniques in architecture as they specifically relate to design processes and procedures. The topics of the course will borrow concepts from computer science, computational geometry and other fields and adapt them to specific design problems such as design development, fabrication, robotics, material simulation, and environmental analysis. A specific area of interest for the course will investigate the relationship between computational methods and fabrication processes. Using the past as a frame of reference for what is to come, we will examine the history of machine epistemology in architecture and draw from a variety of precedents ranging from early 19th century to the present and investigate how design actualization relies on available tools and knowledge of techniques.

OBJECTIVE

The objective of the course is to help students become better informed users of digital tools and develop the skills necessary for creating or manipulating computational solutions for specific design problems, which include geometry generation and manipulation, analysis of data and design evaluation. As part of the course, students will acquire some hands on experience in parametric modeling and programming as this is the craft that underpins computational design.

METHOD

Class will meet on Fridays for lecture and discussion. The lectures will frame larger topics within an architectural and historical context while also providing time for further instruction on complex topics.

The second meeting day will be given over to guided workshops paired with the introduction of homework assignments. These assignments provide students with the opportunity to learn and practice new tools and techniques. The workshop sessions allow for the demonstration of concepts and methods in an interactive setting.

The mid-term project asks students to analyze a precedent project and develop as set of diagrams with a parametric model. The final project invites students to collaboratively engage in computational thinking through analogue and digital methods.

PREREQUISITES

ARCH_2101/2102 for undergraduates / ARCH_6101/6102 or M2 standing for graduates.
A basic knowledge of computers and experience with 3D modeling, particularly Rhinoceros, is highly-recommended. No prior programming experience is expected or required.

CREDIT HOURS / WORK EXPECTATIONS

This 3-credit course requires two hours of classroom or direct faculty instruction and approximately six hours of out-of-class student work each week for approximately 15 weeks. NOTE: six hours is an only an estimate. Students of different abilities may take more or less time to complete their course work, but this is considered the average. Out-of-class work may include but is not limited to: lab assignments, extended projects, and required videos.

HELP / TA / OFFICE HOURS / RESOURCES

Another goal of this course is learning how to become a more independent computer user. This means learning how to teach yourself and fix your own problems when they arise. We will have