ARCH – P7123 - AIM1 – Architecture, Image & Media (1st module - taught in French & English – some lectures & reviews are in English)
https://alicelab.be/

Formal Analysis and Computer Process

Teachers: Denis Derycke (coordinator), Michel Lefèvre
Invited lecturer: Uri Wegman, Julien Rippinger

Objectives & content

The *Formal Analysis and Computer Process* module considers architectural composition as an operation primarily based on principles that are inherent to architecture itself, devoid of any form of contextualization, function or ideological content. It assumes that the purpose of architecture mainly lies in the shapes and spaces through which architecture reveals itself, as well as in the graphic means – drawings and models – through which architecture is designed, which are often its only mode of existence. In such an approach, the design is no longer meant to produce a concrete output; the creation of exploratory composition processes becomes an end in itself.
In terms of keywords, this module addresses the following topics: formal composition, theory of architecture, graphic representation, 3D computer graphics, computer programming, digital fabrication.
More specifically, this teaching unit addresses the following aspects of the *Masters in Architecture* programme profile:
- "to develop a reflexive attitude that enhances the theories and the practices of architecture"
- "to produce and deploy a spatial expertise by using knowledges acquired in the fields of representation and communication.
Concretely, the teaching of the *Formal Analysis and Computer Process* module gives students the possibility of exploring those topics by conducting a personal project which consists of composing architectural shapes with computer programming.

The module includes two complementary types of sessions/courses:
- *Graphic Analysis & Formal Composition* (studios & lectures). Students will investigate a given artwork or set of artworks from the same artist. The objects of study are from the fields of painting, sculpture, music or architecture (mainly from the 1960s and the 1970s), and their composition methods are related to systemic processes. Students are asked to extract formal vocabulary and recurrent composition rules out of their object of study, by using only graphic means. Then, they will translate and interpret those rules with parametric computer programming, so as to generate random (parametric) architectural configurations that match their initial analysis. In the end, they will proceed to an *architectural rendition* of the work of art they previously analyzed. Axonometric drawing and 3D printing are the recommended media for both the analysis and the production of parametric architectural configurations (students will have access to seven 3D printers Ultimaker 2+, Ultimaker 3, Elegoo Mars & Elegoo Saturn).
- *Procedural Modeling, Computer Programming and 3D printing* (seminars & practical work) covers the technical aspects of the module. It aims at the development of skills in procedural modeling and Python programming with the 3D software *Blender*. Students will be able to generate parametric architectural compositions based on the analysis produced in the course *Graphic Analysis & Formal Composition*. Notions of 3D printing (extrusion of PLA plastic and stereolithography/SLA) will be taught as well, as 3D printing is a method of formal investigation strongly supported by the module.

Please note that this module does not requires programming skills as a prerequisite. However, the teaching of this module is mainly based on students' work. The production of documents is constant all along the semester; it is therefore time-consuming, and full commitment is required in order to fulfill the expectations. This module is taught in English or in French (or in French & English), according to the number of foreign students who sign up.

Learning activities

Studio work: As in an architectural design course, students present their work in progress to the teachers at every session. A few lectures will be organized to give guidance about methodology, and information about the various artworks under study
Seminars: Students follow the teacher's instructions to learn how to code with Python programming language on their own laptop.
Practical work: Students develop the technical aspects of their work (programming & 3D printing) with the assistance of the teachers.

Assessment

Assessment is based on the students' project (students are invited to work in pairs). Projects are reviewed by a jury at the end of the module. The grade depends mainly on the jury's final review. Midterm reviews and participation in studios are also taken into account.

2024-2025 theme

Based on the analysis of a piece of art, exploration of autonomous compositional systems contained in the space of a 10 centimeter cube.