DESCRIPTION

Computing *Materia* proposes a new outlook on creation of form through knowledge of materials, introducing physical computation as a huge resource for inspiration in architectural design working process. The course will give students theoretical fundamentals that enable them to speak of more contemporary design strategies, deepening knowledge on the logic of tectonics versus digital generation. Later during the course, students will build their own software to understand and recreate digitally the material systems and material behavior, producing more than just architectonic shapes.

OBJECTIVES

The aim is to introduce students to the making of new digital tectonics that play a fundamental role in the future shaping of our constructed environment. This course introduces design computation and material computation as a means to control the growing complexities of contemporary architectural design, building proto-architectural forms generated only by the use of computation itself.

**Design Information & materiality in architecture:** this thematic will explore the design potential of specific material systems and the way to code and translate digitally such potential applied to design. Starting from materiality and the physics of materials, the course will explore form-finding processes in design.

Building a knowledge framework of construction techniques via the establishment of previous computational protocols). This thematic will include the comparison with fabrication methodologies from pre-computing ages or from the beginning of computational period or the systematic use of personal computers (e. g. Gaudí, Frei Otto, Eladio Dieste, Miguel Fisac, Prada Poole, Heinz Isler).

**Programming material systems:** departing from previous knowledge acquired by the students about algorithmic design, this thematic will explore the manipulation of fabrication data according to the response and properties of architectural materials. We'll study the physical performance of the specific design projects, preparing fabrication strategies of the real prototypes and 1:1 scale simulations.

LEARNING OUTCOME
• Students will have the domain over digital computing using information embedded in the material systems.

• Development of material-based computational design processes, and understanding how such processes can operate in the context of real materialization of architectural projects.

• Material computation: embedding physical constraints into digital project.

• The course will give the students a spectrum of techniques/technologies that question the usual approaches to architectural design.

ASSESSMENT SCHEME

Research assignment (25%)

Computational Design Project (50%)

Explicit working methodologies (15%)

Participation (10%)

COURSE FORMAT

Lectures

Design project assignment

Tutorials

In-class assignments

REQUIRED READINGS


RECOMMENDED READINGS

FIELD TRIP

No field trip scheduled

IMPORTANT NOTE TO STUDENTS:

Attention is drawn to University policy and regulations on honesty in academic work, and to the disciplinary guidelines and procedures applicable to breaches of such policy and regulations. Details may be found at http://www.cuhk.edu.hk/policy/academichonesty/ . With each assignment, students will be required to submit a statement that they are aware of these policies, regulations, guidelines and procedures.