AR-327

Introduction to computational architecture

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Cursus	Sem.	Type
Architecture	BA6	Obl.

Language of teaching	English
Credits	3
Withdrawal	Unauthorized
Session	Summer
Semester	Spring
Exam	During the semester
Workload	90h
Weeks	12
Hours	**2 weekly**
Courses	2 weekly
Number of positions	**30**

It is not allowed to withdraw from this subject after the registration deadline.

Summary

This course introduces the students to text programming practice in 3D modeling (Rhinoceros3D). The main objective of the course is to develop a computational mindset to maximize the use of efficient digital tools in architectural design.

Content

This course is composed of 4 modules:

1. 3D modeling (CAD) where the fundamentals of geometry are reviewed and advanced techniques of 3D modeling are covered.
2. Introduction to Python (IDE, variables, functions, etc) and object-oriented programming (OOP) where the basics of programming are studied.
3. Basics of Computational modeling where students will be introduced to and use RhinoCommon (API, documentation, general data structure, main library objects and usage) to produce basic geometric elements and operations through scripting.
4. Intermediate Computational modeling where students will be introduced to more complex RhinoCommon's functionalities (advanced manipulations and geometries, custom classes) to produce advanced geometric elements and operations through scripting.

This configuration in 4 modules allows to gradually increase the level of complexity and to initiate architecture students to computational thinking.

Keywords

Computational-thinking, architecture, coding, 3D-modeling, architecture-programming

Learning Prerequisites

Recommended courses

- AR-114 : Modélisation numérique
- AR-219 : Introduction aux outils CAO en architecture

Learning Outcomes

- Identify the different modeling techniques
- Classify these techniques by their degree of efficiency

- Develop code and debug simple to medium advanced Python code
- Develop creatively use RhinoCommon API and programming to solve complex design tasks.
- Propose an appropriate method to build a script and implement it.

Transversal skills

- Use a work methodology appropriate to the task.
- Plan and carry out activities in a way which makes optimal use of available time and other resources.
- Use both general and domain specific IT resources and tools
- Demonstrate the capacity for critical thinking

Teaching methods

- Lectures (1/3 to 1/2 of each session)
- In-class tutorials (1/2 to 2/3 of each session)

Expected student activities

- Participation during the course
- Pro-active attitude for class exercises
- Independent realization of exercises after each week

Assessment methods

An evaluation is done at the end of each 1,2 weeks with an exercise to be handed in for the following week on the theme studied.

Supervision

Office hours	No
Assistant.e.s	Yes
Forum	Yes

Resources

Virtual desktop infrastructure (VDI)

Yes

Websites

- https://ibois-epfl.github.io/AR-327-2026-Introduction-to-computational-architecture/

Moodle Link

- https://go.epfl.ch/AR-327