

# *def* ALGORITHMIC DESIGN (.):

## ARK-E1024 Algorithmic Design D, 6 cr

### TEACHING LEAD

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### COURSE DESCRIPTION

The course deals with methods of algorithmic design applied to the field of architecture, landscape and interior architecture, construction, as well as in the broad fields of industrial and product design. Although many architects still use computers much like they used analogue drawing boards, intrinsic capabilities of computers allow them to formalize their designs through code. This opens novel approaches in design thinking and articulation and gives designers powerful tools for formalizing their work. This approach also captures and exploits the inherent contemporary condition of creative practices - when designs become data, it becomes possible to create what was previously undrawable. Topics of the course are organized around **programming fundamentals** (*Python programming language and syntax, data types, operators, conditionals, looping, functions, lists, classes, dictionaries*), **Rhino Python and modeling** (*using Python within Rhino, rhinoscriptsyntax library, RhinoCommon SDK, NURBS modeling, Boolean operations on solids, transformation matrices, mesh modeling*) and **computational design** (*random walk algorithms, attractor fields, vector fields, mapping geometry from external data, Lindenmayer systems, evolutionary algorithms, optimization algorithms, particle-spring systems, voxels, Monte Carlo method, curvature mapping, spatial aggregation of discrete parts, cellular automata systems, dynamic relaxation, agent-based modeling, machine learning*). The course is taught through 12 weeks with lectures and hands-on computer exercises. At the end the students are required to develop and present a final project.

### MAX NUMBER OF STUDENTS

20 persons

### TIMES

Tuesdays 09:30 - 12:00

### THIS COURSE WILL BE TAUGHT IN A HYBRID MODE

Detailed information will be shared over MyCourses page after the registration ends.

### REGISTRATION OPENS ON 31.01.2023

<https://sisu.aalto.fi>