



## Course Syllabus

<b>Course Code</b>	<b>Course Title</b>	<b>ECTS Credits</b>
ARCH-582DL	Performance Based Design	10
<b>Prerequisites</b>	<b>Department</b>	<b>Semester</b>
ARCH-572DL	Architecture	Spring
<b>Type of Course</b>	<b>Field</b>	<b>Language of Instruction</b>
Required	Architecture + Computation	English
<b>Level of Course</b>	<b>Lecturer(s)</b>	<b>Year of Study</b>
2 <sup>nd</sup> Cycle	Eftihis Efthimiou	1 <sup>st</sup>
<b>Mode of Delivery</b>	<b>Work Placement</b>	<b>Co-requisites</b>
Distance Learning	N/A	None

### Objectives of the Course:

The main objectives of the course are to:

- To enhance the participants' skills in advanced computational methods through the development and use of high-end CAD tools.
- To advance the use of Parametric Design and the skills acquired from XX1 through the use of third-party plugins and custom scripting.
- To introduce a performance-based approach by generating responsive systems which follow the governing design objectives.
- To develop the skills needed for controlling objective data and informing designs incorporating (but not limited to) environmental, structural and constructional constraints.
- To confront multi-objective design problems by employing optimization techniques.
- To harness data, analyse and visualise design results and output data.

### Learning Outcomes:

After completion of the course students are expected to be able to:

1. Develop advanced, performative computational models using parametric design and scripting.
2. Control and filter large amounts of computation data.
3. Understand and implement computer programming and its use in design applications and apply it in the construction industry.
4. Use and communicate with software/ hardware platforms analysing and extracting objective data

5. Use plugins to inform designs against environmental, structural and human interaction constrains
6. Create responsive environments able to handle multiple objectives

**Course Contents:**

1. Parametric-associative design logic
2. Advanced parametric-associative modelling
3. Using available Plugins and developing custom designed ones
4. Introduction to Programming
5. Objective design
6. Data control, output and communication

**Learning Activities and Teaching Methods:**

Lectures, Computer Demonstrations, Workshops, Tutorials, Discussions, Presentations, Practical Exercises and Assignments.

**Assessment Methods:**

The lecture course is assessed by the submission of coursework (assignments):

- Presentations and short writings that will accumulatively set personalised positions on a range of computational design approaches or methods (as introduced via lectures, directed readings and research).
- Short design project and presentation assessing the participants' ability to conceptualise and design parametric models and their ability to understand the assembly process.
- Final exam. The participants are required to demonstrate their digital design competencies through submitting a final design project and participating in an exam.

**Required Textbooks / Reading:**

Title	Author(s)	Publisher	Year	ISBN
AAD_Algorithms-Aided Design - Parametric strategies using Grasshopper	Tedeschi, Arturo	Edizioni Le Pensur	2014	978-8895315300

**Recommended Textbooks / Reading:**

<b>Title</b>	<b>Author(s)</b>	<b>Publisher</b>	<b>Year</b>	<b>ISBN</b>
From Control to Design: Parametric/Algorithmic Architecture	Meredith M., Iasch A. (ed.), Sasaki M., (ed),	Actar	2008	8496540790 978-8496540798
Finding Form: Towards an Architecture of the Minimal	Otto, F. and Rasch B.,	Axel Menges	1996	3930698668 978-3930698660
The New Mathematics of Architecture	Burry, Jane	Thames and Hudson Ltd; Reprint edition	2012	978-0500290255
Computational Design Thinking	Menges, Achim	John Wiley & Sons	2011	978-0470665657