Course guide
290264 - INTRAP4 - Introduction to Parametric Architecture

Last modified: 11/07/2025

Unit in charge: Vallès School of Architecture
Teaching unit: 752 - RA - Departamento de Representación Arquitectónica.

Degree: DEGREE IN ARCHITECTURE STUDIES (Syllabus 2014). (Optional subject).

Academic year: 2025 **ECTS Credits:** 4.0 **Languages:** Spanish

LECTURER

Coordinating lecturer: Bertomeu Farnós, Gerard

Others: Soriano Botella, Enrique
Serra Ureta, Marc

TEACHING METHODOLOGY

Learning outcomes:

- Design a simple parametric architecture project
- Know the different types of data and their dependencies
- Know the vocabulary of architectural geometry
- Recognize the efficiency of parametrically generated projects

LEARNING OBJECTIVES OF THE SUBJECT

Introduce the basics of parametric design using Rhinoceros Grasshopper
Architectural Geometry: set of geometric tools for complex construction.
Pre-rationalization: set of strategies to design optimal forms to build
form-finding: efficient search for form through dynamic relaxation (catenaries, funicular forms, trusses) Post-rationalization: strategies to minimize the cost in the construction of complex geometries.
Shape optimization: evaluate the results of the shape generation process and return this information to modify its input variables

CONTENTS

Subject abstract

Description:
This course is a practical toolset of applied geometry to provide fluency and control on the use of Grasshopper and its environment. The course focus in the geometric control of parametric modelling and efficient fabrication.

Full-or-part-time: 0h 01m
Theory classes: 0h 01m

Programa

Description:
1 Visual programming
2 Data structure
3 Curves
4 Conditional relations and geometric dependencies
5 Surfaces
6 Tights
7 Topology and curvature.
8 Evaluation of the results. Graphical and statistical tools
9 Return of results and update of parameters
10 Generation of manufacturing tools.

Full-or-part-time: 39h 50m
Laboratory classes: 39h 50m

GRADING SYSTEM

50% continuous assessment
50% evaluation of the final exercise

BIBLIOGRAPHY

Basic:
- Pottmann, Helmut. Architectural Geometry. Exton, PA: Bentley Institute Press, 2007. ISBN 9781934493045.
- Reiser, Jesse. Atlas of novel tectonics. New York: Princeton Architectural Press, 2006. ISBN 1568985541.
- Hesselgren, Lars. Advances in Architectural Geometry 2018 [on line]. Vienna: Klein Publishing GmbH, 2018 [Consultation: 19/09/2024]. Available on: https://research.chalmers.se/publication/504188/file/504188_Fulltext.pdf. ISBN 9783903015135.