



Expertos en Fabricación Digital  
Experts in Digital Fabrication



## Grasshopper Advanced Course

The aim of the course is, taking Grasshopper as base tool, to go further with the most popular and best rated apps in order to speed up processes and optimize geometries or calculations; a quite time consuming task to carry out without them. We will go through these plugins learning how they work, main features and advantages playing with practical exercises.

We will highlight key concepts in Computational design, architecture and engineering: topology, form-finding, fractals, loops, genetic and repetitive algorithms.

The course is addressed to professionals or students in engineering, architecture, design and anyone related to creative field.

Language instruction: English (Spanish if all the students can understand it)

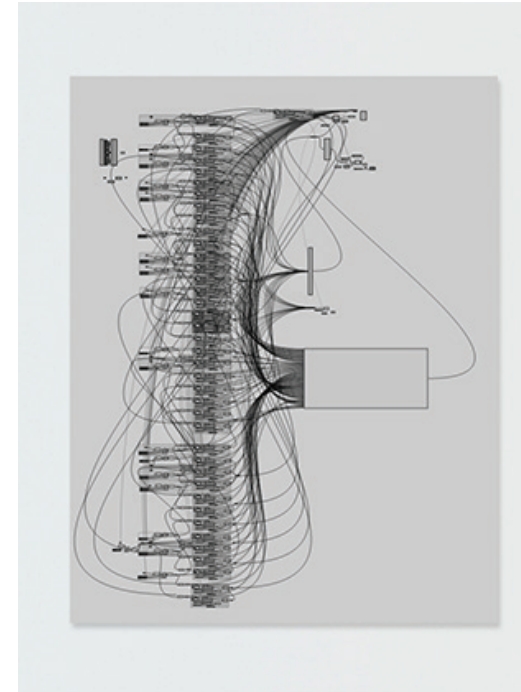
At the end of the course, if the student has attended 80% of classes will be awarded an ARFS and ARTC official diploma of the course.

Pictures are part of the exercises seen in the course.

Controlmad is an Authorized Rhinoceros Training Center (ARTC) and Rhino Fab Studio. (ARFS)  
We are experts in Digital Fabrication. Controlmad team teaches or colaborates at different universities: Univer-sity of Valladolid University of A Coruna, Istituto Europeo di Design Madrid, Universidad Europea Madrid, Universidad Europea de Valencia, San Pablo CEU Madrid...

This course is managed and coordinated by Controlmad Advanced Design Center S.L.  
If you have any questions or concerns, please contact us:

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## MAIN PLUGINS OR APPS\*:

### **Kangaroo**

The most famous and downloaded app for Grasshopper (it is built in the current Grasshopper for Rhino). It is a live physics engine interactive simulation, optimization and form-finding directly within Grasshopper

### **Galapagos**

Available in the current Grasshopper build, it is a platform for the application of Evolutionary Algorithms to be used on a wide variety of problems by non-programmers.

### **Biomorpher**

Interactive Evolutionary Algorithms (IEAs) helping designers to explore the wide combinatorial space of parametric models without always knowing where you are headed.

### **Anemone**

works using repetitive algorithms to create loops or sequential structures like those ones seen in fractals.

### **Dendro**

It provides multiple ways to wrap points, curves, and meshes as a volumetric data type, allowing you to then perform various operations on those volumes.

*\*Based on the group dynamic and development of the sessions, other apps might be explained such us Weaverbird, Lunchbox, Firefly*

Computational design is the application of computational strategies to the design process. While designers traditionally rely on intuition and experience to solve design problems, computational design aims to enhance that process by encoding design decisions using a computer language.





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## PROGRAM

\_ FORM FINDING with particle simulation systems

Geometry 3D shape of a membrane using Kangaroo

Flexible geometry: pneumatic structures, unrolled surfaces, origami...

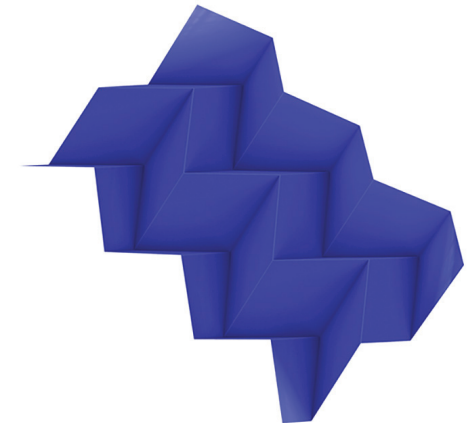
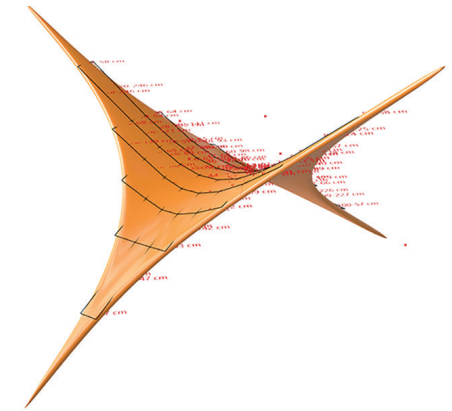
\_MESH workflow and lattice structures.

\_PATTERNS, PANELIZATION AND TEXTURES

\_DATA VISUALIZATION

\_VISUALIZATION TECHNIQUES

We will also learn how to present our scripts in an attractive and organized manner for documentation purpose.





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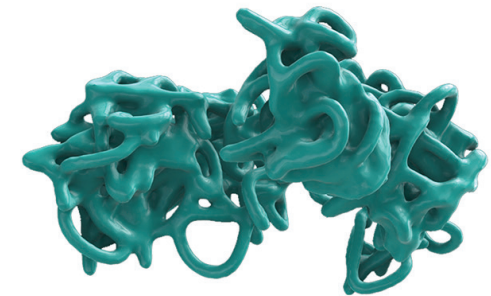
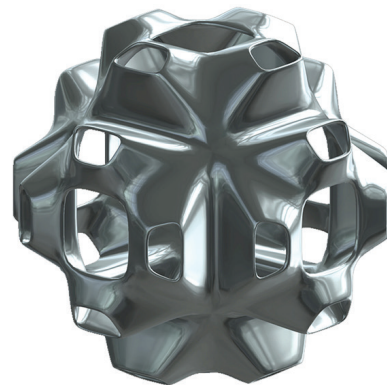
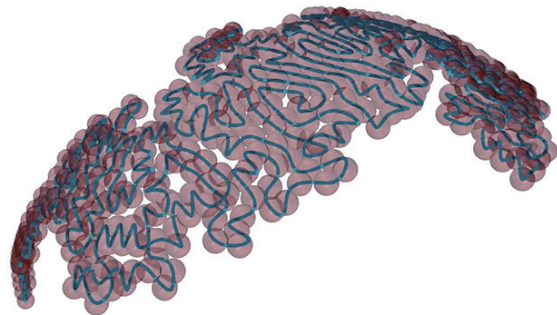
## \_GENERATIVE DESIGN

Designing toothbrush, 100's of them using Biomorpher.

- ALGORITHM GROWTH SIMULATION
- GENERATING GENETIC ALGORITHMS

Generating an abstract shape using Generative Algorithms (Biomorpher) and then optimizing it using Genetic Algorithms (Galapagos)

*\* Program may be slightly altered depends on the number of students, their backgrounds and learning pace.*



### INTELLECTUAL PROPERTY

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