

PROGRAMMED

MORPHOLOGIES

SCRIPTING & LOGICS IN ARCHITECTURE & DESIGN

SAT-SUNDAY //
JULY 20-21

v5.02

IMAGE CREDITS :
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A B O U T \ \

This course is aimed to teach the principles of parametric design using the Grasshopper plugin for Rhino. You will learn the key features of a parametric design approach and how it benefits its application on your design tasks. We will also cover in depth how does Grasshopper works, its interface and how to manage and organize information on it.

C O U R S E D E S C R I P T I O N \ \

Scripting & Logic in design processes are constantly evolving and contributing to new innovative design workflows. The new digital techniques, combined with human sensibility and manual (analogue) techniques, are opening new grounds of design exploration that are directed towards seamless integration of form, material, and the applied forces. This integrated process entails a shift from traditional form-finding techniques to processes of a generative and performative nature. Two-day workshop on Scripting & Logic in Architecture & Design using Grasshopper and Python scripting. The workshop will introduce the basics of grasshopper with visual scripting. It will discuss methods of parametric design, algorithmic modelling techniques and advanced data management for the generation and control of complex shapes using python/grasshopper. Workshop will be focused to cover up several modules along with the introduction of various fractal geometries based over mathematical platforms like grasshopper for Rhinoceros. Tools like processing, Mandelbulb 3d, Apophysis, Python scripting related to generation of fractal geometries and methodology of programming will also be discussed and experimented in the module. It will cover the most important aspect of the visual programming software that will include lectures and guided practical exercises.

S T R U C T U R E \ \

Participants will learn to generate their form with polygonal modelling technique in Rhino. This form will be taken into Grasshopper environment where it will be used to analyse and to develop their design. The workflow will be demonstrated through exercises that deal with different design challenges, interrogating the aesthetic potential of Topological Optimization. Each topic will be presented with both theoretical introduction and practical application. In the afternoon of the second day, participants will split into groups to develop their own projects, with direct supervision from tutor, and towards their last day evening presentation. The workshop technical tutorial has been structured as follows:

DAY 1 SATURDAY (8 HOURS)

1. **UNDERSTANDING GENERATIVE ALGORITHMS FOR FRACTAL USING MADLEBULB3D & APOPHYSIS**
2. **GRASSHOPPER VISUAL INTERFACE**
3. **GRASSHOPPER COMPONENTS**
4. **DATA AND LIST MANAGEMENT IN GRASSHOPPER**
5. **PYTHON SCRIPTING BASICS WITH RHINOCEROS**
6. **DESIGN PROJECT ASSIGNMENT**

DAY 2 SUNDAY (8 HOURS)

1. **VECTORIAL FIELDS**
2. **MESH TESSELLATION AND SUBDIVISION TOOLS [DELAUNAY, SUBSTRATE, VORONOI, OCTREE, LUNCHBOX & PANELLING TOOL]**
3. **LISTS & DATA MANAGEMENT, MANIPULATION, VISUALIZATION**
4. **APPLICATION OF THE LEARNED TECHNIQUES IN A PARAMETRIC DESIGN EXERCISE.**
5. **BASICS OF LASER CUTTING**
6. **FABRICATION TOOLS AND PLUGINS TO REALIZE YOUR PARAMETRIC DESIGNS USING THE LASER CUTTING MACHINE.**

T A K E A W A Y S \ \

- Understanding Parametric Design main characteristics
- How the Grasshopper Interface works
- How information is organized and managed in Grasshopper
- How to create parametric models
- Take home with you your own parametrically designed hand-on model.

TOOLS \\

All the participants should have following tools installed on their workstations:

1. **Rhinoceros SR12** or Higher (30-day Trial version can be downloaded from https://www.rhino3d.com/download)
2. **PanellingTools** for Grasshopper (https://wiki.mcneel.com/labs/ panelingtools)
3. **Lunchbox for Grasshopper** (http://www.food4rhino.com/app/lunchbox)
4. **MadleBulb3D** and **Apophysis**
5. **Python** (Framework can be installed before workshop)
6. **AutoCAD**
7. **Adobe Suite**

REGISTRATION \\

A total of **15 seats** are available for the workshop per workshop coordinator. Registration will close 3 days prior to the workshop or till the seats last.

Please follow the link to complete the registration:

1 PASS permits 1 PARTICIPANT in 1 WORKSHOP

Refer to the **eduPass** Section to learn more about the Professional/Student/Group/Multiple registration.

CALENDER \\

The workshop will be held on:

JULY 20 : 10:30 AM - 7:30 PM (SATURDAY)
JULY 21 : 10:30 AM - 7:30 PM (SUNDAY)

VENUE: Third Floor, 145/1, Shahpur Jat, New Delhi

REQUIREMENTS \\

- Anyone from the design background or an enthusiast in the field of design are invited for this workshop with basic knowledge of 3-D modelling acquired on Rhino should be there).
- If you wish to gain expertise in Rhinoceros Join our workshop Algorithms and Parametric Fabrication in Design V 5.01
- Participants should bring their own computer with above mentioned software installed. More details will be sent to the registered participants.

CLASSROOM COMPETITIONS

Classroom competitions are a part of this series of workshops and is meant for all the designers who want to explore their way with hands on experience to gain skills and create real world projects. Under this series you participate in workshops at one of these Micro-studio and get awareded a trophy.

In association with **UNI**, we are now expanding our vision of creating these micro-studios globally with a fusion of online design community and offline classrooms.

This fusion will help us in combining different ideologies and diverse methodologies, to create a continuum which links ideas such as exploration, debate and collaboration at a global level to understand and create **'Architecture of Everything'**

EDUPASS

EDUpass is a pass which can be used to participate in any workshop in this series (registration to be done 3 days prior the commencement of the workshop). Multiple EDUpasses can be purchased and used in a group to attend a single workshop or a single participant can register for multiple workshops.

For example, If you had purchased 6 passes, you can register to 6 different workshops or bring along 5 other friends/colleague with you to a attend a single workshop of your choice.



HOW DOES IT WORK?

A Participant can purchase as many passes as he/she wants and 1 PASS permits entry to any 1 workshop and classroom competition of his/her choice.

SPARRO

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