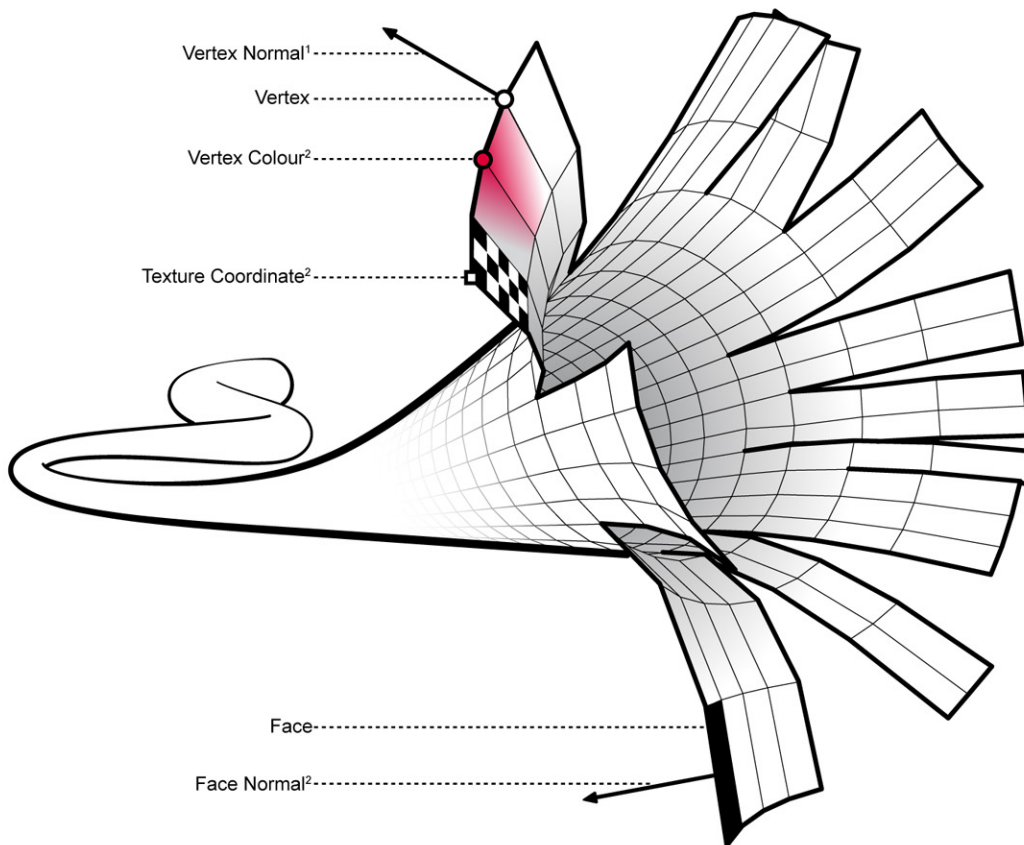
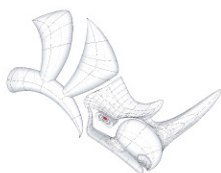


# SimplyRhino

sales, training and support



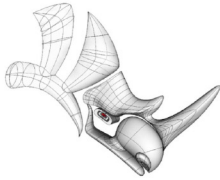
1. Defaults available  
2. Optional property



**RhinoCeros**  
NURBS modeling for Windows

## Python in Rhinoceros Two Day Introduction

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# McNeel Europe

European division of Robert McNeel & Associates

## Python in Rhinoceros Two-day Introduction

For designers and engineers who want to lay the foundation for Rhino.Python scripting, as well as RhinoScript users who want to stay up to date, this workshop will convey necessary ideas and tools to successfully code geometry in Rhinoceros 5 on Windows and Mac. McNeel's instructor is Giulio Piacentino.

As a participant, you will be guided through the details of this new and friendly programming language in Rhino, including: automating commands at necessity with macros, performing calculations, making decisions after iterating code and manipulating several data structures. Also, we will study how to couple Python's iteration and recursion powers to extend Grasshopper.

### Structure

This course is divided in 4 units of 4 hours, for a total of two days. We will start by running scripts with the editor and then learn to write them by ourselves. We'll also learn tricks to debug and to optimize our code. We will cover all Rhino's geometrical base, building through vectors, points, curves, meshes surfaces and polysurfaces in order to achieve an understanding of the potential of each of these elementary types.

### Audience

This course is intended for existing Rhino users who have a good working knowledge of 3D modeling.

### Results

After this course, participants have the basis to:

- Understand how to run, edit and compose Python code for Rhinoceros 5
- Identify and correct common bugs that can prevent code from executing
- Distinguish variables, functions and other procedural and object-oriented paradigms
- Find their way to access available resources both online and offline

### Prerequisite

Rhinoceros v5 (most recent), Grasshopper (latest version from [www.grasshopper3d.com](http://www.grasshopper3d.com)), GhPython

### Outline

#### Day I, AM – Environment

- Python Script Editor
- Online resources:
  - RhinoScriptSyntax SDK Help
  - RhinoCommon SDK Help
- Running existing scripts
- The 'Hello World' program
- Variables: uses and name conventions
- Conditionals and their use
- Common arithmetic operations

#### Day I, PM – Graphics from macro-style

- Packaging: getting data from the user
- Expressions: evaluation
- Iteration: looping code several time
- Debug: break points, prints, call stack
- Points, vectors, lines, circles, cones
- Containers: lists, tuples

#### Day II, AM – Writing function

- Pseudocode for recursion-based fractals
- Splitting curves with parameterization: lines
- Trigonometry application
- Curves, surfaces, 3D space
- Brownian motion
- Analyzing surfaces and curves
- Modifying geometry to fit criteria
- Building geometrical types from data
- Loading and saving to files

#### Day II, PM – Learn managing own projects

- Last geometrical types
- Using library classes
- Brief introduction to classes: objects
- Animating the viewport and rendering
- Keeping the script responsive
- Profiling, variations and optimizations