

COMPUTATIONAL DESIGN WORKSHOP

Parametric Design with Rhino & Grasshopper

AI-Driven Architectural Visualization

ROUND 5

A two-part, hands-on curriculum: algorithmic modeling and digital fabrication in Rhino & Grasshopper, followed by AI-powered image generation across ComfyUI, Flux, ChatGPT and Nano Banana (Gemini).



RHINO



GRASSHOPPER



RHINO.INSIDE.REVIT



COMFYUI



CHATGPT - NANOBANANA

All lectures are explained with practical applications and hands-on tasks.

Workshop Overview

Two parts, one continuous design pipeline — from parametric form to AI-rendered vision.



PART ONE

Rhino & Grasshopper

Parametric & algorithmic design foundations

- Parametric design & Rhino modeling
- Algorithmic modeling with Grasshopper
- Data trees, curves & surface analysis
- Skins, plugins & digital fabrication
- Rhino Inside Revit interoperability



PART TWO

AI-Driven Architecture

From AI image generation to fast creative workflows

- ComfyUI: text-to-image & image-to-image
- ControlNet, IPAdapter & style transfer
- Inpainting, outpainting & AI-driven 3D
- Flux workflow, Fill, Redux & Kontext
- NEW — ChatGPT + Nano Banana (Gemini) fast workflow

Workshop at a Glance

Everything you need to know before we start.



TOTAL HOURS

36_{hrs}

Full hands-on curriculum across parametric design and AI visualization.



CHAPTER

12

2 chapters per week — structured pace for deep, practical learning.



UPON COMPLETION

CERTIFICATE OF COMPLETION

Awarded to every graduate who completes the full workshop.



RHINO
INSIDE
REVIT

PART ONE

Rhino & Grasshopper

Parametric, organic and algorithmic design, from interface fundamentals to fabrication-ready geometry.

01 — Foundations of Parametric Modeling



MODULE 1

Introduction to Parametric Design

- Overview of parametric design principles
- Navigating the Rhino interface
- Workflow between Rhino viewports and their properties
- Exploring the Command bar and Rhino menus
- Modeling deconstructed architecture using Gumball, control points, edges, and surfaces



MODULE 2

Advanced 3D Modeling Techniques

- Understanding and analyzing double-curved surfaces from reference images
- Simulating complex parametric and organic architecture shapes using Loft, Patch, Sweep, and SubD

02 — Algorithmic Modeling with Grasshopper & Data Management



MODULE 3

From Components to Computation

- Introduction to the Grasshopper interface
- Working with components and data structures
- Display controls and managing preview settings
- Understanding Grasshopper's data flow, and Basic concepts, operations and transformations using vectors
- Advanced transformations: Box Morph and geometry mapping



MODULE 4

Controlling Curves and Surfaces

- Using filters to manage geometry and logic
- Generating and controlling numerical sequences
- Remapping numbers and using attractors
- Parametric representation and analysis of curves
- Parametric surface generation, analysis tools, and understanding surface curvature

03 — Skins, Data Trees & Plugins



MODULE 5

Skins & Advanced Data Management

- Manipulating and structuring the Data Tree
- Creating responsive skins using data control
- Sorting strategies with complex Data Trees
- Introduction to LunchBox for surface paneling and data workflows



MODULE 6

Grasshopper Plugins

- Exploring essential plugins for generative design
- Mesh+ — mesh modeling and transformation tools
- Weaverbird — mesh subdivision and smoothing
- Voronoi — pattern generation and spatial optimization

04 — Fabrication & Revit Integration



MODULE 7

Digital Fabrication Preparation

- Ensuring geometry is fabrication-ready using tolerance and mesh checks
- Precisely preparing models for laser cutting and 3D printing



MODULE 8

Rhino Inside Revit

- Introduction to Rhino Inside Revit
- Setting up and managing the Rhino Inside environment within Revit
- Data exchange and interoperability between Rhino, Grasshopper, and Revit
- Practical workflows for parametric design in Revit using Grasshopper



PART TWO

Architecture using AI

AI-powered image generation and fast creative workflows — ComfyUI, ChatGPT, and Nano Banana (Gemini).

05 — Introduction to AI Image Generation



MODULE 9

ComfyUI Fundamentals

- Overview of AI-powered image generation
- Introduction to ComfyUI fundamentals
- Text-to-Image workflows
- Image-to-Image workflows
- Image upscaling techniques



MODULE 10

Guided & Reference-Based Generation

- Understanding ControlNet modules: Canny Edge Detection, Depth Maps, Image Segmentation
- Applying ControlNet to guide image generation
- Using IPAdapter for reference image-based generation and style transfer

06 — Inpainting, Outpainting & Advanced Flux



MODULE 11

Editing & Emerging 3D Concepts

- Inpainting and outpainting techniques in ComfyUI
- Integrating image and text prompts for 3D generation
- Exploring workflows to create 3D visuals from AI-generated content



MODULE 12

Introduction to Flux & Advanced Techniques

- Overview of Flux tools and capabilities
- Generating images with Flux and applying Flux ControlNet
- Flux Fill — smart content-aware filling techniques
- Flux Redux — generating alternative variations of reference images
- Flux Kontext — context-aware editing for iterative design

NEW

07 — ChatGPT & Nano Banana (Gemini): Fast AI Workflow



TOOL A

ChatGPT for Concept & Direction

- Rapid concept generation and design narratives
- Prompt engineering for architectural visuals
- Iterating briefs and creative direction at conversation speed



TOOL B

Nano Banana (Gemini) for Image Speed

- Ultra-fast image generation from text and reference images
- Quick iterative edits and variations
- Strong consistency for fast concept-to-visual turnaround
- (NEW) Integrated directly inside [Rhino](#) and [Revit](#) plugins for **free** dev by us.

BEST-PRACTICE FAST WORKFLOW



Brief

Define intent in ChatGPT



Prompt

Refine prompt & references



Generate

Fast pass in Nano Banana



Refine

Iterate, upscale, finalize

Selected Student Works

A showcase of outstanding projects from our last cohort — Rhino, Grasshopper & AI Visualization.

[VIEW FULL WORKS PDF](#)



WHO WE ARE

Meet Your Instructors

Two architects. One shared mission — training the next generation of computational designers. **100+ trainees** across Rhino, Grasshopper & AI integration.

TECHNICAL DESIGN ARCHITECT



**ESLAM
ASHRY**

- Dar Al-Handasah – Smart Village
- Specialist in Complex Geometries & Parametric Systems
- Advanced Grasshopper workflows & fabrication-ready modeling
- Expert in Rhino, Grasshopper plugins & surface analysis

CREATIVE DESIGN ARCHITECT



**AMR
KHALED**

- Dar Al-Handasah — Satellite Design Studio
- BIM Developer & AI Integration Specialist (Over 25 AI Workflows)
- Plugins developer Like EasyRVT & NanoBanana inside Rhino & Revit
- eVolo Skyscraper Winner 2024



HANDS-ON THROUGHOUT

Every lecture pairs theory with practice.

All lectures across both parts are explained with practical applications and tasks — from parametric modeling and fabrication in Rhino & Grasshopper, to AI-driven visualization with ComfyUI, ChatGPT, and Nano Banana (Gemini).