Parametric Design in Architecture Training Course

Professional Development Training Course Outline

Category	Architectural Engineering	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Parametric Design in Architecture represents a transformative shift in the way buildings are conceived, generated, and optimized. By integrating computational design, algorithmic modeling, and data-driven workflows, architects are now able to create highly responsive and adaptive structures. Tools such as Rhino, Grasshopper, Python scripting, BIM integration, and generative design systems enable designers to move beyond static forms into dynamic architectural systems that evolve based on performance, context, and environmental inputs. Parametric Design in Architecture Training Course equips learners with cutting-edge skills in digital architecture, computational thinking, and advanced parametric workflows aligned with global industry standards.

In today’s architecture and construction industry, parametric design is a key driver of innovation, sustainability, and fabrication efficiency. From complex façade systems to performance-optimized structures, designers are leveraging algorithmic architecture, AI-assisted design, and digital fabrication technologies to reduce costs and improve environmental performance. This course provides hands-on mastery of design automation, form-finding strategies, simulation-based design, and smart geometry systems, preparing professionals to excel in architecture firms, urban design consultancies, and computational design studios worldwide.

Programme Curriculum

Parametric Design in Architecture Training Course

Introduction

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Course Duration

10 days

Course Objectives

1. Master Parametric Modeling Techniques using Grasshopper for Rhino
2. Develop expertise in Computational Design Thinking and logic-based architecture
3. Understand Algorithmic Design Principles for adaptive structures
4. Apply Generative Design Strategies for form exploration
5. Integrate BIM + Parametric Workflows for smart project delivery
6. Learn Python Scripting for Architecture Automation
7. Implement Performance-Based Design Optimization (energy, structure, daylight)
8. Explore Digital Fabrication Techniques (CNC, 3D Printing, Laser Cutting)
9. Create complex Data-Driven Architectural Systems
10. Develop Responsive and Adaptive Building Facades
11. Use Simulation Tools for Environmental Design Analysis
12. Build Advanced Parametric Geometry Systems
13. Prepare for industry-ready roles in Computational Design and Smart Architecture

Target Audience

- Architecture students and graduates
- Professional architects seeking digital upskilling
- Computational design enthusiasts
- BIM engineers and consultants
- Urban designers and planners
- Interior designers exploring parametric forms
- Structural engineers interested in form optimization
- Design researchers and academic professionals

Course Modules

Module 1: Introduction to Parametric Design

- Basics of computational architecture
- Evolution from CAD to parametric systems
- Design logic vs traditional drafting

- Introduction to Grasshopper
- Case Study: Zaha Hadid Architects workflows

Module 2: Rhino Fundamentals for Architects

- 3D modeling essentials
- NURBS geometry understanding
- Precision modeling techniques
- Layer management systems
- Case Study: Heydar Aliyev Center modeling approach

Module 3: Grasshopper Interface & Logic

- Node-based programming system
- Data trees and relationships
- Component libraries
- Basic parametric definitions
- Case Study: Parametric pavilion structures

Module 4: Algorithmic Design Thinking

- Rule-based design systems
- Iterative design processes
- Conditional logic in architecture
- Pattern generation systems
- Case Study: Beijing National Stadium structure logic

Module 5: Data Structures in Parametric Design

- Lists, trees, and data flow
- Sorting and filtering geometry
- Data mapping techniques
- Complex relationship management
- Case Study: Facade pattern optimization systems

Module 6: Parametric Facade Design

- Responsive façade systems
- Solar analysis integration
- Kinetic façade principles
- Panelization strategies
- Case Study: Al Bahar Towers adaptive façade

Module 7: Environmental Analysis Integration

- Sunlight and shadow simulation
- Wind flow analysis
- Energy efficiency modeling
- Climate-responsive design
- Case Study: Sustainable skyscraper design systems

Module 8: Structural Parametric Systems

- Form-finding techniques
- Structural optimization methods
- Load-based design adjustments
- Grid and shell structures
- Case Study: Munich Olympic Stadium structure

Module 9: Generative Design Techniques

- AI-assisted design exploration
- Evolutionary algorithms
- Design iteration automation
- Shape optimization systems
- Case Study: Autodesk generative design projects

Module 10: Python Scripting for Architects

- Basic scripting in design automation
- Geometry generation using code
- Workflow automation
- Custom tool creation
- Case Study: Automated floor plan generator

Module 11: BIM + Parametric Integration

- Linking Grasshopper with Revit
- Data exchange systems
- Smart documentation workflows
- Design-to-construction pipelines
- Case Study: Large-scale hospital BIM coordination

Module 12: Digital Fabrication Techniques

- CNC machining processes
- 3D printing in architecture
- Laser cutting workflows
- Material behavior in fabrication
- Case Study: ICD/ITKE Research Pavilion

Module 13: Responsive Architecture Systems

- Kinetic building components
- Sensor-based design systems
- Smart building responsiveness
- IoT integration in architecture
- Case Study: Media-TIC Building Barcelona

Module 14: Advanced Parametric Urban Design

- City-scale modeling systems
- Urban density simulations
- Infrastructure optimization
- GIS integration techniques

- Case Study: Masdar City planning system

Module 15: Final Capstone Project

- End-to-end parametric project development
- Real-world design brief execution
- Portfolio development
- Presentation techniques
- Case Study: Student-led computational design studio projects

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Ready to enroll or request a customized program? Book online or contact us:

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