Algorithmic 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

Algorithmic Architecture represents the convergence of computational design, parametric modeling, artificial intelligence, and digital fabrication to redefine how the built environment is conceived and delivered. In an era driven by data-driven design, generative workflows, and smart city innovation, architects are no longer limited to static forms; instead, they leverage algorithms, scripting, and automation to create adaptive, optimized, and high-performance structures. Algorithmic Architecture Training Course equips learners with cutting-edge tools and methodologies to harness computational thinking, machine learning integration, and advanced simulation techniques in real-world architectural practice.

Through a blend of hands-on training, real-world case studies, and industry-relevant projects, participants will explore how algorithmic strategies can solve complex design challenges such as sustainability optimization, structural efficiency, urban analytics, and responsive environments. By mastering tools like parametric software, visual programming, and AI-assisted design platforms, learners will gain a competitive edge in the rapidly evolving Architecture, Engineering, and Construction (AEC) industry, positioning themselves at the forefront of digital transformation and future-ready design innovation.

Programme Curriculum

Algorithmic Architecture Training Course

Introduction

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Course Duration

10 days

Course Objectives

1. Understand computational design principles and algorithmic thinking
2. Master parametric modeling and generative design workflows
3. Develop skills in visual programming (Grasshopper/Dynamo)
4. Apply AI in architecture and machine learning concepts
5. Implement data-driven design strategies
6. Optimize buildings using sustainability analytics and performance simulation
7. Explore digital fabrication and robotic construction techniques
8. Create adaptive systems using responsive architecture concepts
9. Integrate BIM with algorithmic workflows
10. Learn urban data analysis and smart city modeling
11. Enhance design automation and scripting skills (Python/C#)
12. Solve complex problems with generative algorithms and optimization tools
13. Build professional portfolios using real-world case studies and projects

Target Audience

- Architecture students and graduates
- Urban planners and designers
- Civil and structural engineers
- BIM professionals and consultants
- Computational designers
- Interior and environmental designers
- Faculty and academic researchers
- Tech enthusiasts interested in **AI-driven design**

Course Modules

1. Introduction to Algorithmic Architecture

- Evolution of digital architecture
- Computational vs traditional design
- Algorithmic thinking basics
- Tools overview
- **Case Study:** Parametric façade design in modern buildings

2. Fundamentals of Parametric Design

- Parameters and constraints
- Associative geometry
- Rule-based design
- Iterative modeling
- **Case Study:** Stadium roof parametric modeling

3. Visual Programming Basics

- Node-based logic
- Data trees and structures
- Workflow automation
- Script visualization
- **Case Study:** Complex form generation using visual tools

4. Advanced Parametric Modeling

- Multi-parameter systems
- Pattern generation
- Surface manipulation
- Geometry optimization
- **Case Study:** Pavilion design using parametric systems

5. Computational Geometry

- Mathematical design principles
- Transformations and topology
- Mesh and surface modeling
- Algorithmic form-finding
- **Case Study:** Freeform architecture modeling

6. Scripting for Designers

- Introduction to Python/C#
- Writing custom scripts
- Automation workflows
- Debugging techniques
- **Case Study:** Automated façade paneling system

7. Generative Design Techniques

- Evolutionary algorithms
- Rule-based generation
- Design exploration
- Optimization strategies
- **Case Study:** Office layout optimization

8. Building Performance Simulation

- Environmental analysis
- Daylighting and energy modeling
- Climate-responsive design
- Simulation tools

- **Case Study:** Net-zero building analysis

9. AI in Architecture

- Machine learning basics
- AI-assisted design tools
- Predictive modeling
- Neural networks in design
- **Case Study:** AI-generated building concepts

10. Digital Fabrication

- CNC, 3D printing
- Material optimization
- Fabrication workflows
- Robotics in construction
- **Case Study:** 3D-printed housing project

11. BIM Integration

- BIM fundamentals
- Linking parametric models
- Data interoperability
- Workflow integration
- **Case Study:** BIM-driven smart building

12. Responsive & Interactive Architecture

- Sensor-based design
- Kinetic structures
- Real-time data integration
- Smart materials
- **Case Study:** Adaptive façade systems

13. Urban Data & Smart Cities

- GIS integration
- Urban analytics
- Data visualization
- Smart infrastructure
- **Case Study:** Data-driven urban planning

14. Design Optimization

- Multi-objective optimization
- Structural efficiency
- Cost-performance balance
- Algorithm refinement
- **Case Study:** Bridge structure optimization

15. Capstone Project

- End-to-end design workflow

- Real-world problem solving
- Portfolio development
- Presentation techniques
- **Case Study:** Industry-based project execution

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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