Computational Design Workflows Training Course

Professional Development Training Course Outline

Category	Architectural Engineering	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Computational Design Workflows Training Course is designed to equip learners with advanced skills in parametric design, algorithmic modeling, generative systems, and data-driven architecture workflows. As the AEC (Architecture, Engineering & Construction) industry rapidly shifts toward AI-assisted design, BIM integration, and automation-driven fabrication, this course bridges the gap between traditional design thinking and next-generation computational methodologies. Participants will gain hands-on experience in tools such as Grasshopper, Rhino, Dynamo, Python scripting, and generative design platforms to create intelligent, adaptive, and optimized design solutions.

This training emphasizes a workflow-based learning approach, enabling professionals to move beyond static modeling into dynamic, responsive, and performance-driven design systems. By integrating machine learning in design, environmental simulation, structural optimization, and digital fabrication pipelines, learners will be prepared for roles in smart architecture, computational urbanism, and advanced product design. The course is structured to reflect real-world project scenarios, ensuring learners develop both technical proficiency and strategic problem-solving capabilities aligned with global design innovation trends.

Programme Curriculum

Computational Design Workflows Training Course

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Course Duration

5 days

Course Objectives

1. Master Parametric Design Thinking for adaptive architecture systems
2. Develop skills in Algorithmic Modeling & Computational Geometry
3. Implement Generative Design Workflows using rule-based systems
4. Integrate BIM + Computational Design Automation pipelines
5. Apply AI-assisted Design Optimization Techniques
6. Utilize Grasshopper & Rhino Scripting for Advanced Modeling
7. Build Python-based Computational Design Scripts
8. Explore Data-driven Urban Design & Smart Cities Modeling
9. Perform Environmental Simulation & Performance Analysis
10. Develop Digital Fabrication & CNC Workflow Integration
11. Apply Topology Optimization & Structural Intelligence Tools
12. Create Real-time Design Feedback Systems
13. Prepare for Industry 4.0 Digital Architecture Workflows

Target Audience

1. Architects and Architectural Designers
2. Civil and Structural Engineers
3. Urban Planners and Smart City Designers
4. Product and Industrial Designers
5. BIM Specialists and Technicians
6. Design Technology Consultants
7. Architecture Students and Researchers
8. Digital Fabrication and Robotics Enthusiasts

Course Modules

Module 1: Foundations of Computational Design

- Introduction to parametric thinking
- Design logic and rule-based systems
- Geometry and algorithm fundamentals
- Overview of computational tools (Rhino, Grasshopper)
- Workflow setup and design environment
- **Case Study:** Parametric façade system for climate-responsive architecture in coastal environments

Module 2: Parametric Modeling Techniques

- Advanced Grasshopper definitions
- Data trees and parametric relationships
- Adaptive component design
- Iterative design refinement
- Constraint-based modeling
- **Case Study:** Adaptive shading system for a commercial skyscraper

Module 3: Algorithmic & Generative Design

- Rule-based generative systems
- Evolutionary algorithms in design
- Design space exploration
- Optimization loops
- AI-assisted variation generation
- **Case Study:** Generative layout planning for high-density housing

Module 4: BIM & Computational Integration

- Linking BIM with parametric tools
- Revit-Dynamo workflows
- Data exchange protocols
- Automated documentation systems
- Design coordination systems
- **Case Study:** BIM-integrated hospital design coordination system

Module 5: Python for Computational Design

- Python scripting fundamentals
- Geometry automation scripts
- Data manipulation techniques
- API integration with design tools
- Custom tool development
- **Case Study:** Automated structural grid generator for stadium design

Module 6: Environmental & Performance Simulation

- Climate analysis tools
- Solar radiation studies
- Wind flow simulation
- Energy performance modeling
- Optimization feedback loops
- **Case Study:** Energy-efficient office tower optimized through simulation-driven design

Module 7: Digital Fabrication & Robotics

- CNC and laser cutting workflows
- 3D printing for architecture
- Material behavior and constraints
- Robotic fabrication systems
- File-to-factory pipelines

- **Case Study:** Fabricated pavilion using robotic arm assembly system

Module 8: Advanced Computational Design Projects

- Integrated workflow development
- Multi-parameter optimization
- Real-time data integration
- Presentation and visualization
- Industry-ready portfolio development
- **Case Study:** Smart urban plaza with responsive environmental and social systems

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	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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