

# Scale it up

## Digital fabrication workshop from design to production

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*Student pavilions from the Architectural Association London, ETH Zurich, Detmold University, University of St. Joseph, University of Southern California, Lodz University, Porto University, Washington University, Tonji University, ICD and ITKE Stuttgart –  
Compilation of images from various sources*

# ADVANCED DESIGN: INNOVATION AND TRANS-DISCIPLINARITY IN DESIGN

## 2023-2024

### **WEEK 1      11-12 April**

- Introduction to digital fabrication methods
- Construction processes informing design processes
- Case studies
- Material and machine specificities
- Design and construction logistics
- Discussing the necessity of uniform presentation and standardization
- Grasshopper tutorials

**TASK:** Design and digital fabrication of 1:10 models & their respective documentation and proposal plan for 1:1 construction

### **WEEK 2      18-19 April**

- Presentation of 1:10 digitally fabricated models by all teams
- Expert input & Peer-2-peer reviews
- One project is selected for scaling up
- Discussion about material sourcing and timeline
- Design optimization for 1:1 construction
- Assembly methods
- The importance of prototyping
- Challenges and corrective measures
- Documentation methods and examples
- Intro to AR for construction
- Grasshopper tutorials

**TASK:** Production of technical details for 1:1 construction, preparation of construction documents & documentation of the process

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### **WEEK 3      25-26 April**

- Presentation of partial 1:1 prototypes
- Final check of construction documents
- Revision of timeline
- Documentation of the design and construction process
- Design of a construction manual
- Packaging and naming of the parts
- Health & safety design
- Booking machinery and splitting of tasks among group
- Discussing the place of final assembly
- Design of the event and preparation of promo material

**TASK:** Production and packaging of all parts for assembly, manual for the assembly and disassembly, documentation. Preparation of promo material for the opening.

### **ASSEMBLY DAY + OPENING**

To be arranged

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### WORKSHOP DELIVERABLES

(All teams should use the exact same template, fonts, sizes, etc in InDesign for all intermediate tasks to prepare for the overall deliverable)

**1 pdf document** containing:

- All design solutions with their respective data and photos of 1:10 model
- Documentation of all stages from design to production
- Annex with Design and Construction documents + assembly plan

**1 video clip** of the design to production process with all necessary data

### INDICATIVE BIBLIOGRAPHY

- Fleischmann, M., Menges, A., 2011. ICD/ITKE Research Pavilion: A Case Study of Multi-disciplinary Collaborative Computational Design, in: Gengnagel, C., Kilian, A., Palz, N., Scheurer, F. (Eds.), Computational Design Modelling. Springer Berlin Heidelberg
- Iwamoto, L., 2009. Digital Fabrications: Architectural and Material Techniques, 144 p. edition. ed. Princeton Architectural Press, New York.
- Kolarevic, B., Klinger, K., 2008. Manufacturing Material Effects: Rethinking Design and Making in Architecture, 1 edition. ed. Routledge.
- Kolb, D., 1984. Experiential Learning: Experience as the Source of Learning and Development. Prentice Hall, Englewood Cliffs, N.J.
- Martinez, S.L., Stager, G.S., 2013. Invent To Learn: Making, Tinkering, and Engineering in the Classroom. Constructing Modern Knowledge Press, Torrance, Calif.
- Menges, A., Ahlquist, S., 2011. Computational Design Thinking: Computation Design Thinking, 1 edition. ed. Wiley, Chichester, UK.
- Schimek, H., Ruffo, E., Wiltsche, A., Manahl, M., 2012. Sewing Timber Panels. Presented at the 17th International Conference on Computer Aided Architectural Design Research in Asia, Chennai, India.
- Self, M., Walker, C., 2010. Making Pavilions. Architectural Association Publications, London.