

# PARAMATERIA

PARAMATERIA.com

## Advanced Course in Parametric Design, Digital Manufacturing and Product Development

The Paramateria program is an advanced parametric design course in the fascinating fields of digital manufacturing, robotics and product development that qualifies you for the growing parametric design job market. It is intended for tech-driven young professionals keen on pursuing exciting careers in leading-edge industries like robotic fabrication, product design, fashion, architecture and automotive. The participants will actively create innovative, customized and sustainable products from start to finish, acquire an array of interdisciplinary skills and knowledge, and learn to solve real-world manufacturing challenges. During the course participants will gain experience in operating within highly equipped industrial facilities as well as enjoy a productive campus atmosphere at the Eberswalde University of Sustainable Development.

*Open your door to the exciting and rapidly expanding job market of Parametric Design!*

**Dates:** 4 Oct – 10 Dec 2019

**Locations:** LIGAS Berlin and the Eberswalde University of Sustainable Development

**Price:** 1250,-€ 950,-€

Additional 10% off for former Controlmad students!

**Language:** English

**Participants:** 12



## Who is the course for?

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- Young professionals interested in pursuing parametric design and fabrication as a career prospect.
- Architects, industrial designers, engineers, programmers and similar professionals interested in exploring technology, innovation and sustainability options.
- Former participants of the Controlmad Summer Workshop for Design & Parametric Fabrication or similar courses
- Advanced knowledge of Grasshopper is required

## Course Content

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### Introduction to Robotic Control - 5 days

The number of robotic installations has significantly increased in the recent years. Industrial robots cover a vast field of applications. In this workshop the participants will learn how to set up and operate an industrial robot. Part of the workshop is creating custom measuring tools as well as writing codes via manual programming, teach-in and with the plug-in Kuka|Prc for Grasshopper.  
**Applied Material: Plywood**

### Excursion to Raumprobe and ICD - 1 day

A one-day excursion to two of today's most relevant facilities for exploring innovative materials and robotic technology:

**1.** For more than 10 years, **Raumprobe** has been providing architects, designers, manufacturers and the construction industry with a comprehensive library of materials with over 50,000 samples. **2. The Institute for Computational Design and Construction** is dedicated to the teaching and research of computational design and computer-aided manufacturing processes in architecture.

### Robotic Fabrication of a Parametric Table "Funghi" - 7 days

Rhino and Grasshopper are used to develop a parametric model of a dining table. A key element of the workshop is to create smart definitions that are suitable for product customization and consider the fabrication constraints within the form-finding process. This course unit focuses on understanding the differences in machining strategies between a 5-axis CNC and a 7-axis robot within the design and manufacturing process required for a customizable design object. **Applied Material: Corian**



### Robotic Based Handling and Fabrication of a Timber-Shell Pavilion - 7 days

The workshop aims to introduce key principles of design-for-manufacturing -and-assembly (DfMA) to the robotic production of complex architectural structures of timber. It covers ongoing research in the field of hybrid pre-fabrication design and just-in-time, on-site robotic manufacturing strategies. Participants learn how to develop their own approaches to the design and fabrication of custom spatial structures of timber through individual hands-on development of custom constraint-based models.

**Applied Material: Solid Wood**

### Mobile Acoustic Walls - 7 days

Modern working environments are focused on maximizing the sharing of information amongst employees and co-workers within communication-enhancing, open-plan offices, cafés, chill and play areas, etc. Once a larger number of people are working and communicating with each other in such enclosed spaces, advanced room acoustics are required. In this workshop, participants are presented with the design and manufacturing process for customizable acoustic walls, before applying the process themselves from start to finish. **Applied Material: Plywood and PE Foam**

### Coding with C# - 5 days

This part of the course covers the basics of object-oriented programming. Participants will learn how to extend the capabilities of Grasshopper using the C# language and the RhinoCommon API in order to create customizable sunshades. The geometry of the sunshade will be dependent on factors such as the location of the building, local neighborhood and a building layout. Scripting will be used to access online weather databases via their WebAPIs. Eventually, the custom product will be fabricated using a laser cutter.

**Applied Material: Metal**

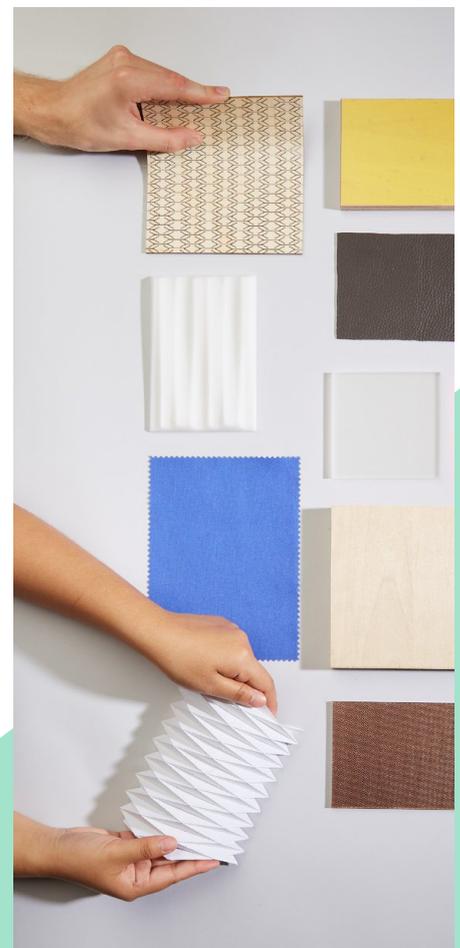
### Excursion to STFI: Smart Textiles - 1 day

The Saxon Textile Research Institute specializes in technical textiles. Participants are presented with an overview of smart textile applications and research projects. The workshop introduces embroidery technology as a part of the manufacturing process for multifunctional, composite foldable textiles.

**Applied Material: Textile**

### Case Study: Design and Fabrication of an Origami Pavilion - 15 days

The case study serves to practically apply what has been learned in the various modules. Participants determine the optimal form of a foldable, reusable, lightweight pavilion intended for exhibition applications. They do so based on physical and static specifications, which they evaluate by means of the Kangaroo software application. The design and manufacture of the pavilion's shell, floor and complete interior will be carried out using a high-performance laser cutter. **Applied Material: Plywood and Textile**



Enroll in the course at:  
[PARAMATERIA.com/enroll](https://PARAMATERIA.com/enroll)

Contact us:  
[contact@paramateria.com](mailto:contact@paramateria.com)  
+49 30 4099867-50

## Meet our tutors:



**Tassilo Goldmann**  
Wood Engineer

In 2019, Tassilo completed an MSc in wood engineering at HNEE, where he is currently working as a research associate. Fascinated by parametric design, he has specialized in 3D modelling and digital fabrication. As a Paramateria tutor, his responsibilities cover computer numeric fabrication and timber processing.



**Tim Peters**  
Wood Engineer

After studying carpentry and working as a traditional joiner, Tim studied wood engineering at the Eberswalde University for Sustainable Development (HNEE). He is currently pursuing a master's degree and works as a research associate at HNEE. Tim specialises in digital fabrication for industrial design products using CNC machines, robots, 3D-Printer and laser cutters.



**Simon Lullin**  
Wood Engineering Technician

Simon graduated from the Berner Fachhochschule BFH in Biel, Switzerland. After acquiring experience working in Berlin as a technician in robotics and head of R&D for Artis GmbH and FabLab Berlin, he is now based in Switzerland and works as a Freelancer all across Europe, implementing new robotic cells and teaching professionals about new technologies and programming techniques.



**Ryan Hughes**  
Architect and Researcher

Ryan is a computational designer with an interest in the use of robotic fabrication in construction, particularly the design for manufacturing and assembly (DfMA) of lightweight and timber structures. After establishing the Architectural Robotics and Computation Lab as well as the High-Performance Architecture group at C.F. Møller Architects, he recently began his PhD in collaboration with the Computational Design (Code) group at Zaha Hadid Architects and Odico Construction Robotics.



**Mateusz Zwierzycki**  
Architect and Programmer

Mateusz is an architect, designer, researcher and is the co-author of the Projektowanie Parametryczne, the first Polish website for parametric tools in architectural design. Author of the Owl, Starling, Squid, Anemone and Mesh Tools plugins and many more. He is also the founder of the Object consultancy, Milkbox group, workshop tutor, teacher, and parametric design popularizer. Mateusz is currently a research assistant to the Digital Design Methods Chair at BTU Cottbus.



**Jasper Precht**  
Product Designer

Jasper has studied product and interface design at the Potsdam University of Applied Sciences. Fascinated by iterative design approaches, mostly known from human computer interaction, he applies these methods to develop physical products that are adaptive and parametric. Since 2018 he has worked as a freelancer in parametric design and as a visual artist. Ergonomics and human-centered design are his main topics during the Parametria course.