

**MaP**  
Doctoral School  
advanced manufacturing



## 1 Advanced Manufacturing

### Transforming raw materials into useful products

- Innovations in manufacturing are driven by global challenges like resource scarcity and climate change, along with technologies such as digitalisation, robotics, and AI.
- Advanced manufacturing technologies reduce costs, regardless of part complexity or production quantity, while minimising environmental impact, especially CO2 emissions.
- "Advanced Manufacturing" covers the entire value chain, from raw materials to final products in industrial, construction, and clinical sectors.
- Key areas include additive, robotic, and hybrid manufacturing, production engineering, advanced process control, and data-driven methods.

## 3 Events and Courses

### Current and past events

- Workshop on scientific storytelling
- MaP Distinguished Lecture Series "Additive Manufacturing"
- SAMCE: Swiss Advanced Manufacturing Community Events

→ [www.doctoral-school.ethz.ch/events](http://www.doctoral-school.ethz.ch/events)

Number	Title	Type	ECTS	Hours	Lecturers
064-0025-24L	Introduction to Computational Research in Architecture, Engineering, Fabrication and Construction	W	2 credits	3K	R. Block
101-0139-00L	Scientific Machine and Deep Learning for Design and Construction	W	3 credits	4G	B. Bickel, A. Müller, M. Piovacci
101-0167-01L	Fibre Composite Materials in Structural Engineering	W	3 credits	2G	M. Motavalli
102-0357-00L	Waste Recycling Technologies	W	3 credits	2G	M. Haupt, V. Burg
151-0293-00L	Fundamentals and Applications of Combustion	W	4 credits	2V + 1U + 2A	N. Noiray, F. Ernst, C. E. Frouzakis
151-0317-00L	Visualization, Simulation and Interaction - Virtual Reality II	W	4 credits	3G	A. Kunz
151-0353-00L	Mechanics of Composite Materials	W	4 credits	2V + 1U	G. Pappas
151-0524-00L	Continuum Mechanics I	W	4 credits	2V + 1U	A. E. Ehret
151-0544-00L	Metal Additive Manufacturing - Mechanical Integrity and Process Simulation	W	4 credits	3G	E. Hosseini
151-0623-00L	ETH Zurich Distinguished Seminar in Robotics, Systems and Controls	W	1 credit	1S	B. Nelson, M. Hutter, R. Kaltschmann, C. Menon, R. Riener

## 2 Organisation and Focus

### Track co-chairs

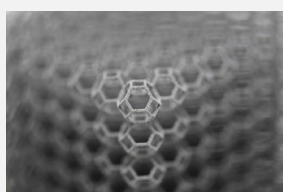
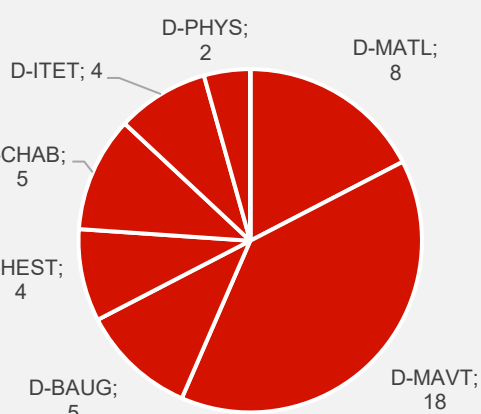


Prof. Dr. Markus Bambach  
Advanced Manufacturing,  
D-MAVT



Prof. Dr. Mirko Meboldt  
Product Development  
Group, D-MAVT

### Doctoral students in track



ETH 3D-printed polymer truss lattice (based on bitruncated octahedral unit cells).



Materials

Innovation

Design

Processes



Compliant Mechanism: Elmiger, Danun, Meboldt

## 4 Impressions



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