



You are a  
PreDoc student and  
want to improve your  
scientific skills?

**TU Austria Summer School Doc+**  
**21. – 25. September 2020**

**TU Austria:** In 2010 the three Austrian Universities of Technology, the Vienna University of Technology, the Graz University of Technology, and the Montanuniversität Leoben founded "TU Austria". This association, which focuses on the field of science and engineering, has more than 49,000 students, 5,500 graduates and 8,600 members of staff. The TU Austria-Universities join forces and use synergy effects in order to accomplish more in research, teaching and higher-education policy and to be convincing as a strong partner in the industrial and economic sectors with their cumulative expertise.

# TU Austria Summer School Doc+ Program

TU Austria Summer School Doc+ offers a great opportunity to get in touch with methods for Engineering Design. You will learn how to address design questions systematically and develop creative solution approaches for various challenges. Additionally, you will increase your team skills and benefit from exchanging information and experience with fellow students from the TU Austria universities.

**Target group:** PreDoc students from the three Austrian universities of technology (TU Wien, TU Graz, Montanuniversitaet Leoben)

During the summer school the concepts of two Engineering Design approaches will be elaborated. The working language is English.

## ► Design for Transformation

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Kick-Off	Challenges of today's industries	Workshop I	Workshop II	Final Pitch
Get-Together Key-Note	Actual challenges in different subject areas	"Axiomatic Design"	"Design Thinking"	Presentation & Awarding of the best concepts
Field Trip "Zentrum am Berg"	Introduction to Engineering Design			
Social Dinner	Fireside Talk			

*Date:* 21. – 25. September 2020

*Location:* Montanuniversitaet Leoben, Franz-Josef-Straße 18, 8700 Leoben

Detailed information about the location and timetable will be shared in advance.

## ► Kick-Off

### **Content:**

Starting with a warm welcoming and an introduction to what to expect in the upcoming days, we will have our first Get-Together on Monday morning.

A special Key-Note from Mag. Hannes Haunschmid, member of the Management Board of Pierer Industrie AG, is awaiting us. He will give an insight in upcoming challenges and trends in the industry.

Second point on the agenda is our field trip to the Zentrum am Berg (ZAB). With the ZAB at the Styrian Erzberg, the Montanuniversitaet Leoben operates a unique and independent research infrastructure focused on the construction and operation of underground facilities.

## ► Challenges of today's industries

### **Content:**

Transformation describes the change from the actual state to a desired target state in the near future. It represents a fundamental and lasting change. Current transformation processes can be seen in various areas. What transformation means for modern industries and which challenges lie ahead will be discussed in discourses of the following topics:

- Digital Transformations and Smart Logistics  
(Helmut Zsifkovits – Montanuniversitaet Leoben)
- Transformation in the Energy Systems  
(Thomas Kienberger – Montanuniversitaet Leoben)
- Future Waste  
(Roland Pomberger – Montanuniversitaet Leoben)
- What is Design?  
(Christopher A. Brown – WPI)

These presentations should serve as additional input for defining the design problem, which will be worked on the following workshop days.

On Tuesday evening, we will have a Fireside Talk at the local restaurant Port 361.

## ► Workshop days

### **Content:**

The focus on these days is to understand concepts and application of the design approaches described below. Through team exercises, group work and case studies as well as theoretical input you will develop the ideas of Engineering Design and learn how to use them in your future work.

## ► Axiomatic Design:

Axiomatic Design proposes a systematic approach for the design of products, processes, components, software etc. Axiomatic design applies a scientific approach for designing products according to customer needs. It is based on a process defining the following four levels:

- Customer Requirements (Customer Domain)
- Functional Requirements (Functional Domain)
- Design Parameter (Physical Domain)
- Process Variable (Process Domain)

**Course leader:** **Dr.-Ing. Dipl.-Wirtsch.-Ing. Erwin Rauch**



Assistant Professor of Manufacturing Technology and Systems  
 Head of Smart Mini Factory Laboratory  
 Free University of Bozen, Faculty of Science and Technology

Erwin Rauch received his B.Sc. in Logistics and Production Engineering from the Free University in Bolzano (Italy). He also holds a M.Sc. in Mechanical Engineering from the Technical University Munich (TUM) and a M.Sc. in Business Administration from the TUM Business School. He obtained his Ph.D. degree in Mechanical Engineering from the University of Stuttgart with summa cum laude.

Currently he is an Assistant Professor for Manufacturing Technology and Systems at the Free University of Bolzano. His current research is on Industry 4.0, Smart and Sustainable Production Systems, Digitization and Assistance Systems in Production and Axiomatic Design.

## ► Design Thinking:

Design Thinking is both a methodology and an approach. It aims to release as much creative potential as possible among all stakeholders of an innovation project in order to solve complex problems or tasks systematically. Design thinking uses various methods to make the user's view with its wishes, needs and goals visible to the innovation team.

It refers to the methodological aspect: creative thinking should be encouraged, promoted and used in a goal-oriented manner through methodical setting.

**Course leader:** **DI Hemma Bieser, MSc**



Geschäftsführerin | Managing Partner  
 Innovation Company avantsmart

Hemma Bieser founded the innovation company avantsmart in 2011, with the aim of making innovation and sustainability profitable for businesses. Together with her clients, she develops new business models for the energy market of the future and thus co-shapes the energy transition.

She is an expert on new methods and tools in management: design thinking, business model innovation and lean startup strategies. As a consultant, moderator and speaker, she shares her expertise with entrepreneurs, innovation managers, product managers, service designers, researchers and students.

Hemma Bieser is lecturer for innovation, entrepreneurship and transformation at the University of Applied Sciences Technikum Vienna and University of Applied Arts, and Authorized IC Agile Instructor.

## ► Organisational matters

### Application:

Applicants must submit a motivation letter, answering the following questions:

- Why would you like to participate in the TU Austria Summer School Doc+?
- How do you see the importance of Engineering Design for your future work?
- What experience do you have with design problems?

Please send the documents to the contact person at your university. All application documents should be submitted in English and must be received no later than 15 July 2020.

Please note that the number of participants is limited (16 participants).

### Accommodation:

The following two hotels are recommended if you need overnight accommodation. Please book the room yourself, costs will be covered by your university. Tip: When booking, state that you are guest with Montanuniversität Leoben to receive a more affordable rate.

#### HOTEL KINDLER

Straußgasse 7-11  
8700 Leoben | Austria  
+43 3842 43202 - 0

<https://www.kindler.at/>

#### HOTEL BELLINI

Kärntnerstraße 282  
8700 Leoben | Austria  
+43 (0) 664 167 35 16 / +43 (0) 676 488 13 09

<http://www.hotelbellini.at/cms/>

### Costs:

The respective university will cover the costs for TU Austria Summer School Doc+ as well as accommodation, arrival, and departure (public transport only). For details, please speak to the contact person at your university.

### Contact persons:



#### TU Wien

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#### TU Graz

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#### Montanuniversität Leoben

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**► Key Note Speaker****Prof. Christopher A. Brown**

*Professor at the Department of Mechanical Engineering at Worcester Polytechnic Institute*

Chris Brown has been on the WPI faculty since 1989. In 1983 he completed his doctoral work on machining at the University of Vermont, where he also worked in orthopedics and studied ski injuries. As an undergraduate, he was Vermont's only walk-on All-American skier. He raced and coached there during the longest regular season undefeated streak in NCAA history and is a member of UVM's athletic hall of fame. He spent four years in the Materials Department at the Swiss Federal Institute of Technology studying machined surfaces and then two years as the senior research engineer working on product and process development at Atlas Copco's European research center.

Professor Brown has published over a hundred articles on axiomatic design theory and methods, surface metrology, and sports engineering. Chris has several patents with students, including, a fractal method for characterizing surface textures, a friction testing device, and sports equipment to reduce injuries and improve performance. He teaches courses on Surface Metrology, manufacturing, the Technology of Alpine Skiing, and Axiomatic Design.

Brown thinks teaching at WPI is fun because WPI has so many bright students. He likes helping them discover what they can do. Professor Brown also likes combining the beauty of fractals with the challenges of characterizing irregular topographies using experimental mathematics. Brown has worked outside normal engineering applications, with anthropologists studying marks on teeth, archaeologists studying wear on stone tools, and art conservationists to understand the surfaces of photographic paper. Professor Brown likes axiomatic design, because solving design problems is common to all engineering disciplines.

**Mag. Hannes Haunschmid**

*Member of the Management Board of Pierer Industrie AG*

After studying commercial science at the Johannes Kepler University in Linz, Hannes Haunschmid began his professional career at management consultancies in Munich and Vienna. In 2007 he moved to the PIERER Mobility Group, where he has held various management functions since then. From December 2007 to July 2016, Mr. Haunschmid was a member of the Management Board and CEO of the WP Performance Systems Group. He has been a member of the Management Board of Pierer Industrie AG since August 2016.

**► Key Note Speaker****Univ. Prof. Dr. Thomas Kienberger**

*Professor at Montanuniversitaet Leoben (Austria)*

Prof. Kienberger is head of the Chair of Energy Network Technology at the University of Leoben. He holds a Master-degree in Electrical-Engineering and PhD-degree in Energy-Engineering, both from the Technical University of Graz.

After his PhD-studies in 2010, he joined the VC-funded start-up agnion-ENTRADE working as head of R&D and authorized representative. Based on this background in the renewable-energy industry, he started in 2014 as a Professor for Energy Network Technology at the University of Leoben.

His research focusses on the demand-actuated implementation of renewable energy in future energy-grids and on efficient industrial energy-systems. Besides his industrial activities, Prof. Kienberger has raised several M€ in competitive research funding and published more than 40 journal- and conference-papers.

**Univ. Prof. DI Dr. mont. Roland Pomberger**

*Full Professor at Montanuniversitaet Leoben (Austria)*

He worked as a chief executive at Saubermacher Dienstleistungs AG (leading Austrian and middle European waste management company) and in his career he has built up the Saubermacher research and development department. He was responsible for execution of national and international projects in recycling and thermal treatment technology of waste before he was appointed professor in November 2011.

Currently, he is the head of the Chair of Waste Processing Technology and Waste Management at Montanuniversitaet Leoben and is responsible for research and development activities. His expertise lies in waste treatment and recycling technologies, sensor based sorting, solid recovered fuels and Co-incineration and waste system analysis. The Chair of Waste Processing Technology and Waste Management at the Montanuniversitaet Leoben combines core competencies along the entire value chain, including upstream and downstream environmental protection, waste management, collection, recycling and disposal technologies. Under the synonym "Future Waste" characterization and innovative treatment options for various (future) waste fraction (containing critical raw materials) from industrial and household sector are part of research projects. A state of the art environmental and process analytical laboratory for solid, liquid and pasty waste sampling and analyses according to ISO/IEC 17025 standard rounds up the competence of the chair.

**► Key Note Speaker****Univ. Prof. Dr. Helmut Zsifkovits**

*Professor at Montanuniversitaet Leoben (Austria)*

Helmut Zsifkovits took over the IL chair in October 2008. He graduated in business administration at the Karl-Franzens-University Graz, was university assistant at the University of Graz, Head of Logistics/Industry at the Austrian Academy for Executives, Managing Partner of Systemlogistik GmbH, Project Manager at the evolaris eBusiness Competence Center in Graz, Head of the Administration Academy of the City of Graz as well as team leader for intranet projects of UBG/DaimlerChrysler AG.

Helmut Zsifkovits is a member of the board of the Bundesvereinigung Logistik Österreich (BVL) and heads its Styrian regional office. He teaches at various universities and colleges. His work focuses on logistics, process management and complexity management. He has published numerous publications on logistics concepts and other topics.

His personal concern for the chair is an excellent cooperation within the university and an increase of the international reputation of the young chair. Wishes to be able to deal with new and fascinating topics with his team. And to find his graduates at interesting places of operational practice.