

Advanced Topics in Innovation and Organization Design:

Impact for Future and Extreme Environments: Exploring alternative worlds in the Alps using speculative methods.

Course Instructors

Name: Julian Krauss, Prof. Dr. Oliver Alexy
Room: 2024|7 (Entrepreneurship Research Institute, Garching)
Email: julian.krauss@tum.de | o.alex@tum.de



Course Description

At a time when environments are increasingly threatened, extremes are becoming the norm rather than the exception. This requires a shift in thinking, methodology, and approach to design and organisation—based on local specificity, understanding of culture, individual challenges, and potentials through collaboration and innovation. In response, Impact for Future and Extreme Environments (IFF EE) offers Master's students the opportunity to learn how to make a positive impact on our challenged world through field research, hands-on experimentation, creative artistic exploration, and consideration of local site conditions and culture. With its highly site-specific approach, IFF EE enables students to respond to current and future global challenges by engaging with environments that are particularly affected by emerging phenomena related to climate change, biodiversity loss, urbanisation, and more.

IFF EE is divided into two semester modules through which a "Design-through-Research" approach (Module 1, "Researching worlds to come in the Alps through a Design Anthropological lens") and a "Research-through-Design" approach (Module 2, "Exploring alternative worlds in the Alps using Speculative Methods", this document) is being contrasted and practically applied with regards to the development of impact-oriented innovations. Important note: Although for this academic year Module 1 has already taken place, students are welcome to enrol in Module 2 regardless of whether they have attended Module 1.

As the title suggests, IFF EE's semester focus and fieldwork this year is taking place in the Alps, in close collaboration with experts from renowned partnering organizations such as the German Alpine Association (DAV), The Himalayan Institute of Alternatives (HIAL), Germany's Federal Environment Agency (FEA) as well as a variety of experts from research and practice. Due to its strong transdisciplinary approach, Master's students from all disciplines are encouraged to apply to the program, including design and architecture, engineering, the social sciences, and business. Each modules gives students the chance to earn 6 ECTS.

Case Challenge

In the Allgäu Alps, the biggest rockfall in more than 400 years is looming, as a 40-metre-long crack runs right through the summit of the Hochvogel. In a realistic scenario, this means that around 260,000 cubic meters of rock - the equivalent of around 250 freight trains - could fall from the summit into the valley at any time. Even if the scenario may be described as extreme so far, research at TUM suggests that there will be up to hundreds of such potential falls in the Alps alone in the coming decades due to climate change (see the research project "AlpSenseRely"). The reason: periods of heavy rainfall and the disappearance of permafrost due to global warming will lead to more and more such cases, in fact, already today the landscape across the Alps is changing visibly. The thawing of permafrost in particular is a phenomenon for which there are still hardly any solutions, although its effects has severe consequences on a global scale.

While the main objective of both IFF EE modules is to explore, inform and innovate impact-oriented developments at home and around the world, the first module has particularly focused on researching future opportunities for innovation by addressing the issue of permafrost in relation to other emerging changes in the Alps. The second module builds on this work and focuses on the development and testing of impact-oriented (speculative) prototypes to explore possible alternatives for the future.

Course Outline

Review: Winter Semester 2023/2024

Module 1 began with various expert interviews on the topics of permafrost, human-environment interaction in permafrost landscapes, and the cryosphere in the Subarctic, the Trans-Himalayas and the Alps. By the beginning of the "TUM Project Weeks", the participants had a thorough theoretical understanding of qualitative research approaches and how to study the future as an alterity of the present. During the week-long sprint session, the students then undertook field research trips to Bad Hindelang and developed innovation opportunities and conceptual ideas for practical research into possible futures in the Alps ("design-through-research") based on a deep socio-cultural understanding. The semester ended with a video presentation that will guide the design-through-research process in Module 2.

Outlook: Summer Semester 2024

Module 2 is structured as week-long sessions and begins after the semester break in April 2024. Overall, building on the results of the winter semester (see above), the focus is primarily on the development of creative prototypes and an impact-oriented, progress-critical innovation strategy for future life in the mountains ("research-through-design"). This requires commitment and the ability to participate in group work on a weekly basis, both in and outside of class. Accordingly, participation in class is mandatory, although exceptions are granted by arrangement. An important consideration in the design of this course is to offer students a format that completes before the main exam period of the semester. Module 2 ends with a group presentation and reflection on the impact-oriented innovation in the context studied.

Session Overview: Summer Semester 24

#	Date	Topic	Location	Preparation
1	16.04.2023 9.30am - 1pm	Kick-off: Introduction, course logic, grading, organization, case challenge	0502.01.237	Course syllabus, reading list TBA
2	23.04.2023 9.30am - 1pm	Introduction to speculative methods	0502.01.237	TBA
3	24.04.2024 1.30pm - 5pm	Beginning of group work	0502.01.237	TBA
4	30.04.2024 9.30am - 1pm	Group work	0502.01.237	
5	07.05.2024 9.30am - 1pm	Group work	0502.01.237	
6	08.05.2024 1.30pm - 5pm	Group work	0502.01.237	
7	14.05.2024 9.30am - 1pm	Creative session/ Maker's Space	TBA	
8	15.05.2024 1.30pm - 5pm	Creative session/ Maker's Space	TBA	
9	22.05.2024 1.30pm - 5pm	Online Coaching Session	Zoom	
10	28.05.2024 9.30am - 1pm	Creative session/ Maker's Space	TBA	
11	29.05.2024 1.30pm - 5pm	Creative session/ Maker's Space	TBA	
12	04.06.2024 all day	Testing in Bad Hindelang, Allgäu region	TBA	
13	11.06.2024 9.30am - 1pm	Online Coaching Session	Zoom	
14	18.06.2024 all day	Installation at Stüdlhütte, Großglockner area	TBA	
15	19.06.2024 all day	Installation at Stüdlhütte, Großglockner area	TBA	
16	25.06.2024 9.30am - 1pm	Refinement	TBA	
17	26.06.2024 1.30pm - 7pm	Final presentation	TBA	

Note: The classroom 0502.01.237 is a seminar room at the main campus (Arcisstraße 21), building 0502 (Z2) Bestelmeyer Süd, 1st floor, room number 237. Minor changes in the day-by-day setup are still possible and will be communicated in time.

Course Goals

- To learn key theoretical foundations for a better understanding of “research-through-design” strategies, speculative design methods, culture analysis and phenomena-based research methods in shaping innovation and design processes.
- To develop an understanding of the role that creativity and design has in impact-oriented innovation processes.
- To analyze critically emerging phenomena in a site-specific context, and to identify key themes and emerging needs relevant for impact-oriented innovation development.
- To explore the ways in which context-specific and phenomena-based design work can inspire and inform entrepreneurial efforts aimed at addressing social, environmental, and economic challenges around the world.
- To encourage creative thinking and the development of innovative ideas for addressing social and environmental challenges.
- To build skills in ethnographic fieldwork, critical analysis, hands-on prototyping, oral and written communication, and collaborative problem-solving.

Learning Outcomes

After the course, students will be able to:

- Define, explain, discuss critically and apply key theories related to impact, design, and qualitative research methods.
- Interpret, classify, and assess the conduct and performance of any organization’s innovation efforts aimed at addressing social, environmental, and economic challenges globally.
- Describe, compare, and appraise design strategies and innovation concepts in relation to potential societal impact.
- Distinguish the newly learned approaches from previously learned strategies and management methods.
- Evaluate how speculative and creative-artistic approaches about the future may inform innovation processes today.
- Compose design-strategic materials and lead impact-oriented innovation processes.
- Execute on and develop impact-oriented initiatives on a prototypical and conceptual level.

Application and Prerequisites

Given its highly interactive and trans-disciplinary nature, this course is limited to 40 participants. Registration will be facilitated via the online course registration tool, only. In order to keep your seat, attendance at the kick-off is mandatory (excused absence, if communicated in advance, may be permitted for legitimate circumstances, such as health, family emergencies, or similar reasons. A conflict in your schedule is not a legitimate circumstance). If you are more than 5 minutes late to the kick-off, we reserve the right to re-allocate your seat to unregistered participants attending the kick-off, either by their position on the official course waiting list or by random allocation.

For your own sake, we will not allow students to join the course after session 2. If you know that you will not take part in this course after the kick-off, please get in touch, so that we can invite people from the waiting list.

In general, students from all departments are admitted to the seminar, however, a good command of English and a general interest in sustainability/ impact issues as well as hands-on creative problem-solving are basic requirements to complete the course successfully. Please note that your success will greatly depend on your willingness to engage with the case challenge in the form of group work.

As this is an introductory course to critical future-making, there are no formal prerequisites to attend this course. However, we strongly discourage students to attend this course who are not capable of attending all sessions.

Enrolment

Please register via tumonline. Seats are allocated on a first-come, first-served basis. If you have any issues, please send an email to julian.krauss@tum.de.

Assessment

The course is examined via the solution of exercises (“Übungsleistung”). Specifically, we draw on two types of exercises to assess whether you and your team have reached the above-mentioned learning goals. These elements correspond to the “Teaching Methods” listed below. There is no written exam in the traditional sense.

- **Oral, individual – 30%:** We will assess the quality of your contributions in class discussions to see whether you can define, explain, and apply in practice key theories of impact, research-through-design and innovation; describe, compare, and appraise different existing design solutions for a given impact context; and compose innovative ideas for addressing social and environmental challenges through the application of speculative methodologies.

- **Written, group – 50%:** At the end of the course, you will submit your prototype including a presentation in which you will highlight that you reached the key learning objectives of this course. As a group, you will be challenged to develop a unique creative approach to the case challenge, for which you will need to draw on key concepts learned in class. This is used to showcase that you can interpret, classify, and assess the conduct and performance of any organization's innovation activities aiming to inspire, inform and mobilize entrepreneurial efforts aimed at addressing social and/or environmental challenges.

Assessment of oral contributions

Studies on teaching methodology show that you learn best by preparing the material and then discussing it jointly. We (depending on the overall group size, there may be several people evaluating your participation) will not only judge whether you were prepared, but also whether you made a concerted effort at understanding a complex subject matter, react to feedback, as well as how your perspective and approach progresses over time. Hence, for each student, we will regularly assess the quality of their contributions to our joint exploring of the different topics: have you helped everyone in the room to understand better the topic of today, the links to previous topics, and the connections to practice? We do not expect every student to be fully active in each session, however, we will actively call on individual students as well as study groups to ensure we have a sound understanding of the quality of your contributions and to discourage you from free-riding. If we have no trouble remembering who you are even outside of class, very often that will be a good sign.

Teaching Methods

This course will draw on a series of inductive teaching methods. We will provide you with various teaching techniques and input sessions to enable you to access independently a large share of the subject matter. For example, you will learn to study, digest, and present academic content and apply it to current real problems. In addition, you will get to know methods that help you understand the importance of thorough design research practice and critical design for developing impact-oriented innovation, by engaging with emerging, real-world phenomena.

The diverse set of methods you will get to know will help you explore and understand the various roles applied research may play in different types of innovative and entrepreneurial activities. The final deliverable will showcase your creativity and your ability to transfer what you have learned to any (real-life) setting.

Throughout all classroom session, we will help facilitate and guide the course discussion by taking notes on whiteboards and moderate the overall learning journey. We strongly encourage you to take notes yourselves and to consider not bringing laptops and leaving your phones switched off. Specific topics and definitions may be introduced using PowerPoint slides. Finally, note how a large share of learning will occur through you preparing individually and/or in groups for the in-class session (readings, see below). Throughout the fieldwork days, it is recommended to bring your phone in order to record interviews with locals and taking pictures. A more specific packing list and instructions for the days will be handed out in the preparatory sessions.

Preparing for Class, Readings

To be able to complete this course successfully, it will be crucial for you to prepare in advance for the respective session. We do not expect that you perfectly understand everything, however, you will have to sufficiently familiarize yourself with all materials to be able to engage (and not just follow) a class discussion building on these documents.

If you do not know how to read academic papers, make sure you do not read them simply from the beginning to the end. Rather, try to find the information to answer the following questions:

- What question does the paper ask? Answer in one sentence max.
- What answer does the paper give? Answer in two sentences max.
- What is the best piece of evidence the paper provides to support the answer? Answer in three sentences max.
- What does the paper mean for you and the project? Answer in four sentences max.

You will quickly learn that you will be able to identify preliminary answers to these questions by skimming the introduction. Afterwards, find the specific places in the paper that may contain the information you are still missing. Often, the concluding section would be the second place to look.

A list containing the reading list will be distributed before the first session of class.

Technische Universität München
TUM School of Management
Entrepreneurship Research Institute

Arcisstraße 21
80333 München