

GREEN DEAL COLLIDER: SUSTAINABLE FUTURES / ROHELEPPE KIIRENDI: JÄTKUSUUTLIK TULEVIK

EAX6040

BACKGROUND AND PROBLEM

Numerous crises in recent years have demonstrated how fragile our environment, society, and economy are. The European Green Deal 2050 aims to transform the EU into a climate-neutral, modern and competitive economy by eliminating greenhouse gases, decoupling economic growth from resource use, and engaging all EU citizens in all places. Eight strategic actions for achieving the ambitions have been defined, and research and innovation are seen to have a central role in (Commission, 2020): (1) accelerating and navigating the necessary transitions; (2) deploying, demonstrating, and de-risking solutions; and (3) engaging citizens in social innovation. Much research in different fields, enabling and supporting the green transition, is already conducted at the TalTech. However, the bridge from scientific research and technology development to innovation and entrepreneurship is often slow and feeble.

VISION

Addressing the global climate challenges involves an extensive rethinking of policy, technology, and education systems. Bridging research, innovation and entrepreneurship can support and facilitate the transition of societies and economies for achieving the Green Deal missions. TalTech will become the lighthouse for research-based innovation and entrepreneurship. TalTech's knowledge and experience in developing research-driven sustainable products and services will be exported to and taught to other countries and universities in those countries. In Estonia, the preconditions for achieving the vision are favorable: it is a small and flexible country for developing and testing solutions; it has strong e-government that enables seamless information flow; there is already a well-functioning startup ecosystem.

MAIN AIMS

The course aims to support staff and students in pursuing research-based entrepreneurship and developing technically feasible and economically viable products, services, and business models for supporting the Sustainable Transformation of Europe. Several objectives to meet the aim have been defined for the Collider course. (1) Identify research conducted at the TalTech with a potential for commercialization. (2) Explore, Learn & Frame, Ideate & Concept, Analyse & Plan, Build, and Validate the value proposition and solution for research commercialization. (3) Establish and develop processes and best practices for science-based entrepreneurship education at the TalTech. The aim and objectives together drive the research and innovation-based transformative change required to meet the European 2050 climate neutrality goals. The Collider course will focus on the discovery phase supporting the innovation and development of sustainable products and services.

MAIN PROCESS AND MILESTONES

The course focuses on discovering ideas and framing problems and solutions for commercializing the research conducted at TalTech. In addition to inception and close-up, the Collider course is divided into 6 major phases: Explore, Learn & Frame, Ideate & Concept, Analyse & Plan, Build, and Validate. The course will begin with an introductory event for all students interested in learning about its objectives, process, teaching, assessment methods, and prospects beyond the course. The course will conclude with the final event. During the course, five intensive 8-hour-long days are organized to support students working on their challenges during sprints between the meetings.

LEARNING OUTCOMES

The key subject areas of the course include the European Green Deal and Green Transition, design thinking, startup entrepreneurship, and interpersonal skills. Notably, the focus will be on identifying relevant problems and synthesizing science-driven products and services. By the end of the course, students will have acquired the following learning outcomes:

- At the end of the course, the learner will be able to rely on and understand the European Green Deal and Green Transformation-related visions, missions, and challenges.
- At the end of the course, the learner will be able to apply design thinking and startup entrepreneurship concepts, processes, and methods to analyze problems and synthesize science-driven products, services, and business models.
- At the end of the course, the learner will be able to create prototypes for validating the feasibility and viability of products, services, and business models.

- At the end of the course, the learner will be able to use transferable and interpersonal skills in pursuing research-based entrepreneurship: persuasion, adaptability, negotiation and team, communication, and conflict management.

TARGET GROUP AND PRECONDITIONS

The course is aimed at students from all different departments and disciplines (master and doctoral students are favored). However, participation in the course is not limited to TalTech students; people through the Open University, EuroTeQ Course Catalogue and Erasmus+ are welcome to participate. The prerequisite for participation in the course is the will and motivation to learn about the European Green Deal and Green Transformation-related challenges, visions, and missions and create new business models for science-based products and services.

LEARNING AND TEACHING METHODS

The principles and methods of the project and problem-based learning are applied in this course. Students ought to identify research conducted at the TalTech; form interdisciplinary teams; frame and re-frame challenges and problems; formulate the business idea and the solution concept; design, develop and validate a prototype; communicate and present ideas in the course and publicly. Seminars, lectures, mentoring, teamwork, and home assignments are used as learning and teaching methods.

ASSESSMENT METHODS

INDIVIDUAL WORK

- Study Report: Self-Assessment at Beginning and End (based on the Learning Diary)
- Problem OnePager and Presentation

TEAM PROJECT WORK

- Design Research/Proposal
- Business Model
- Prototype and Validation
- Final Pitch and Demonstration

RESPONSIBLE LECTURERS



ERGO PIKAS, Assistant Professor, Department of Civil Engineering and Architecture

Ergo is an Assistant Professor at the Tallinn University of Technology in the Department of Civil Engineering and Architecture. Ergo leads the parametric design workgroup at the Estonian Digital Construction Cluster. Previously, he has worked as a postdoctoral researcher at the Aalto University in Finland, researcher and postdoctoral researcher at the Technical University of Denmark, and Fulbright Visiting Researcher/Student at the University of California Berkeley. He defended his Master of Science degree at the Israel Institute of Technology – Technion in 2012. He defended his Doctor of Science degree in the joint program between Aalto University and Tallinn University of Technology in 2019. Ergo has several years of experience in entrepreneurship and consulting construction companies in Estonia and abroad. He has been related to or is related to three construction startup companies.

Ergo's research interests include construction innovation, digitalization of construction processes, sustainable and energy performance renovation of buildings, and design and design management.

KÄTLIN KANGUR, Lecturer, Department of Mechanical and Industrial Engineering

Kätlin is the program director of the Design and Technology Futures master's program. Kätlin has a master's degree from Aalto University, School of Arts, Design and Architecture. Her primary focus is design for sustainability transitions and methods and approaches that help to facilitate the change for a better future.

PLANNED VISITING LECTURERS

- **MATS SOOMRE**, Belbin Team Roles Accredited consultant and Belbin Regional Representative in Estonia
- **RAGMAR SAKSING**, GreenTech Sector Manager
- **MAYRI TIIDO**, Circular economy and pitch trainer, Materjalivoog.ee
- **KRISTJAN KOLBRE**, Lecturer, VP of R&D at Brainbase.com

MENTORS

Mentors come from TalTech and partner universities departments:

- FinEst Centre for Smart Cities
- TalTech Circular Economy Core Lab
- Raw Materials Projects
- Data Science Group