T4EUWEEK

20 - 24 MAY

BORDERS

T4EU week courses

Funded by the European Union

Buildings Design driven by New European Bauhaus

This course will provide students with tools to address the pressing need for climate change mitigation in the construction ecosystem following the New European Bauhaus (NEB) paradigm. The urgency of the climate crisis requires that new cross-cutting solutions for sustainable built environments are developed and implemented. The NEB can be an instrumental source of comprehensive architectural, technological, rural, urban, and social transformation needed to frame and apply sustainable construction solutions. In this course New European Bauhaus (NEB) principles will be shared and placed in context application across domains. The student will learn how to apply all three values and working principles of the NEB Compass in a building design and learn of innovative approaches in building design.

LANGUAGE: English
ECTS: 3
Max. participants: 20

The course will consist of 4 modules (»minicourses«):
1. New European Bauhaus Compass, its values and working principles
2. Engineered living materials for architecture
3. Restorative environmental and ergonomic design
4. Comfort of the users through acoustics

Each of the modules consists of lectures, practical cases, discussions and exercises. Furthermore, students will work in groups and through mentored research learn about the best practices in sustainable buildings.

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The course will be performed in collaboration with InnoRenew and ARCHI-SKIN project.

BSC, MSC and PhD students of material science, architecture, and civil engineering

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New European Bauhaus Compass, its values and working principles, Prof. Andreja Kutnar

The New European Bauhaus (NEB) is a creative and interdisciplinary initiative that connects the European Green Deal to our living spaces and experiences. It encourages us to build a sustainable and inclusive future together that is beautiful for our eyes, minds, and souls. The built environments that we create should be enriching, inspired by art and culture, responding to needs beyond functionality; sustainable, in harmony with nature, the environment, and our planet; and inclusive, encouraging a dialogue across cultures, disciplines, genders and ages. The NEB Compass can guide us in the creation of the built environment of the future. It can be truly NEB, if the three core values (beautiful, sustainable, together) and working principles (participatory process, multi-level engagement, transdisciplinary approach) are ameet.

Engineered living materials for architecture, Assoc. Prof. Anna Sandak

Progress in biomimetics has led to the fabrication of materials and surfaces with properties similar to the biological sources of mimetic inspiration. These materials underly the development of a new generation of building materials that have remarkable properties typically unachievable with a traditional approach. The course will provide an overview and describe the key challenges regarding possible innovations in the bio-based building sector from the perspective of the development of materials inspired by nature. Students will be involved in an interdisciplinary vision of biology, materials engineering and architecture and will learn about the principles of how living organisms function in their environment. They will learn how the bioinspired solutions can be identified, developed, and applied to design new generation of building materials. Finally, the new concept of merging living cells with material will be presented with the scope of inspiring out-of-the box thinking.

Restorative environmental and ergonomic design, Assoc. Prof. Michael Burnard

Natural environments have been shown to provide restorative properties to people who visit them. In modern society our built environment often separates us from nature, making it difficult to access for many. Bringing nature to where people spend most of their time through nature-inspired design solutions can provide restorative and wellbeing being benefits to people where they live, work, and play. Like the growing trend in personalised medicine that targets treatments for individuals, design solutions should be personalised as well, as there appears to be cultural, regional, and personal differences in responses to elements of nature in the buildings.

Comfort of the users through acoustics, Assist. Prof. Rok Prislan

As we spend most of our time indoors, we need to improve our understanding of all aspects relevant to comfort and well-being in the built environment. The acoustic aspect is generally neglected, although it is essential for verbal communication and personal interaction, privacy, restoration and productivity. Despite these concerns, noise in the built environment is one of the most common causes of complaints, which means that we are not successful with building design and/or simply do not understand well enough what is acoustically relevant. Another challenge is the use of lightweight materials such as wood, which is required for building sustainably but can compromise the acoustic performance of buildings if used incorrectly. In the course, requirements for acoustic comfort are presented together with the quantitative ratings and parameters such as sound insulation and reverberation time. The perception of sound is discussed and methods for assessing users' perceptual preferences are presented. The aim is to better understand the acoustic design requirements that lead to a healthier and more productive built environment.

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Prof. Dr. Andreja Kutnar

University of Primorska & InnoRenew CoE

Andreja Kutnar is a full professor in the field wood science at the University of Primorska in Koper, Slovenia and director of the InnoRenew CoE, research institute established within a Teaming grant "Renewable materials and healthy environments research and innovation centre of excellence" (H2020 WIDESPREAD-2-Teaming: #739574). She is the Head of the The New European Bauhaus Academy Pioneer Hub for Sustainable Built Environments with Renewable Materials (NEBAP Hub) and the coordinator of the pan-European consortium of the New European Bauhaus Academy (NEBA), led by the University of Primorska and composed of 14 partners (one of them Estonian Academy of Arts, EKA), which was offically announced by the European Commission in December 2023 as the sole winner of the call for the establishment of the New European Bauhaus Academy.

She was an Executive Board member of InnovaWood for six years and in the years 2020/2021 president of the Society of Wood Science and Technology Executive Board. She was chair of COST Action FP1407, "Understanding wood modification through an integrated scientific and environmental impact approach" (ModWoodLife). Her areas of expertise include wood composites, therm- hydro-mechanical treatment of wood, and adhesive bonding. Her work focuses on research projects in the fields of natural science, technology, sustainable development of the wood industry, environmental impact assessment of new materials, products, and technologies from origin, manufacturing, use/alteration to reuse or recycle. For the wood industry, she performs life cycle assessments (LCA) and advises on improving environmental impacts across the wood value chain.

In 2016, she was recognized with the "Prometheus of Science for excellence in communication" award for successful multi-level communication in wood science and supporting sustainable development. In 2018, she received the distinguished Zois Certificate of Recognition for important scientific achievements in the field of wood science. And in 2020, she was included in the prestigious European Commission campaign #EUwomen4future that draws attention to outstanding women working in research, innovation, education, culture and sport.

Anna Sandak is the InnoRenew CoE Deputy director and Head of research department for materials. She is associate professor and research associate at the University of Primorska. She was previously employed at Trees and Timber Institute of Italian National Research Council, where she coordinated the Laboratory of Surface Characterization. She is the Management Board member of the The New European Bauhaus Academy Pioneer Hub for Sustainable Built Environments with Renewable Materials (NEBAP Hub).

She has PhD in Wood Science and M.Sc. in Biology. Anna is a member of Italian Society for Near Infrared Spectroscopy, International Committee for Near Infrared Spectroscopy, International Research Group on Wood Protection, and International Society for Plant Spectroscopy. In 2012 she was appointed as IUFRO Officeholder, deputy of division 5.03.05 - Biological resistance of wood. In 2023 she was nominated by the Swiss National Science Foundation (SNSF), and joined the AcademiaNET. She also actively contributes to several COST actions, including FP1006, FP1101, FP1303, FP1407, FP1405, TU1403, CA 15216, CA16226 and CA19145.

In 2022 Anna was awarded the ERC consolidator grant for the project ARCHI-SKIN (101044468-ERC-2021-COG) to develop the novel concept of a bio-active living coating system, pushing the boundaries of traditional materials toward the development of engineered living materials. Anna is analyzing multi-scale relationship and performance of modified and functionalized bio-based materials and implementing them as new architectural elements. Her passion is to search for biomimetic solutions for design of new materials and to promote knowledge-based use of bio-inspired materials in modern sustainable buildings.

Assoc. Prof. Dr. Anna Sandak

University of Primorska & InnoRenew CoE

Buildings Design driven by New European Bauhaus

Assoc. Prof. Dr. Michael Burnard

University of Primorska & InnoRenew CoE

Michael Burnard was born in the United States of America but moved to Slovenia in 2013 to complete his PhD. Mike is now an assistant professor at the University of Primorska where he performs research, teaches, and mentors students. He is also the deputy director of the InnoRenew CoE, a research organisation founded in 2017 following successful funding from the H2020 Widespread-Teaming programme. His research interests are focused on enhancing human health and using wood in the built environment as well as advancing sustainability through intelligent use of renewable resources, particularly in buildings. Mike also works in many other areas including business management, innovation, data science, and ICT. He has or currently serves on the board of several organisations that support the development wood-related research and industry.

Mike was a key writer and concept generator for the InnoRenew CoE teaming applications, has consulted on other teaming applications and projects, and is a dedicated participant in COST Actions. He has seen the positive effects Widening projects and actions can have, and is a firm believer that the programme can produce great outcomes. During his professional career in the US, Mike was a board member (6 years) and President (1 year) of the Portland Wholesale Lumber Association. He is a board member of the Society of Wood Science and Technology and is the Vice-President of InnovaWood. Mike is a frequently invited speaker at international events and PhD schools related to wood science and healthy built environments. He is actively involved in the The New European Bauhaus Academy Pioneer Hub for Sustainable Built Environments with Renewable Materials (NEBAP Hub) activities.

Assoc. Prof. Dr. Rok Prislan

University of Primorska & InnoRenew CoE

Rok Prislan is Head of research department for Buildings and is leading research in the field of acoustics at InnoRenew CoE. He is also assistent professor at the University of Primorska. His main research topics are advanced measurement techniques for sound field characterization and geometrical room acoustic modelling. He is the Management Board member of the The New European Bauhaus Academy Pioneer Hub for Sustainable Built Environments with Renewable Materials (NEBAP Hub).

Before joining InnoRenew CoE and University of Primorska, Rok was working as an acoustic designer/consultant at MK3 d.o.o. and has led over 60 projects in the field of acoustics and noise control. He has been in charge of the acoustic design of a large span of buildings, including theatres, studios, concert venues and offices. His practical experience is complemented with R&D projects that include room acoustic analysis in the cloud, smart acoustic elements and artificial acoustic environments.

Rok has two master's degrees, one in physics (mathematical physics) from the University of Ljubljana and one in engineering acoustics from the Technical University of Denmark (DTU). As such, Rok has a broad overview of acoustics as well as knowledge for modelling natural phenomena. Rok obtained his PhD at the Faculty of Mathematics and Physics, University of Ljubljana, researching the analogies between quantum mechanics and acoustic systems as well as developing room acoustic simulations.

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