

## **Erasmus+ Blended Intensive Programme (BIP)** **Adaptive Materials Workshop “Bio-Based Fibre Architecture” 2026, RIGA (Latvia)**

### **Description of the Programme**

Adaptive Materials Workshop 2026 is an innovative and experimental initiative by the Institute of Architecture and Design (ADI) Riga Technical University (RTU). The initiative is aimed to provide the students and academic staff with hands-on experience in creative spatial design through bio-based knitted textile, engineered timber and large scale 3d printing know-how for architecture.

Interdisciplinary student groups from the ADI (architects and designers) and abroad (NBAA network schools) will be brought together for the first time in the new institution for an intense workshop week, where a workshop of 3 parallel material tracks (knit, timber and 3d printing) will unfold, demonstrating the students a novel approach to design, where the knowledge of material resources, manufacturing technology and relations to other elements in the structure can steer the design decisions early on during the design process.

The workshop is situated at the intersection of architectural membranes, timber engineering, structural analysis. Workshop wants to discuss how future architecture can depart from the fossil-based unsustainable synthetic materials and turn its attention to the ecological bio-based alternatives. How the textile and 3d printed components made with the natural fibers, combined with the fibrous nature of the timber could lead to more sustainable and nature friendly solutions, while still offering exciting design opportunities.

At the technical level, the workshop will investigate the material properties of natural fibres and how they can be integrated into knitted tensile surfaces and 3D-printed components, while the fibre grain direction in timber will be explored as a key parameter influencing structural performance, load transfer, and material efficiency. Each of the using grading techniques informed by digital simulation and analysis. Workshop will help to deepen material literacy and develop design-for-disassembly skills. Emphasis will be placed on identifying strategies for aligning material properties with design intentions—placing the right elements in the right locations based on functional requirements and performance goals.

### **Innovative Thinking**

Students will be given the online lectures about material resources, technological aspects of each of three materials systems, as well as to the textile-based design methods and complimenting timber working techniques as a framework for engaging with material intelligence, spatial systems, and computational processes. At the culmination of the workshop, participants will present their artwork in the public space of RTU.

### **Domain Workshop – Knit, Timber, and 3D Printing**

BIP Adaptive Materials Workshop 2026 is an innovative and experimental initiative by RTU ADI, aimed at providing students and academic staff with hands-on experience in creative and sustainable architectural design using bio-based knitted textiles, engineered timber, and large-scale 3D printing. The workshop combines an online virtual component with a five-day on-site session at RTU.

During the online phase, students are introduced to the theoretical aspects of each material system, including resources, technical background, design methods, and fabrication constraints. The on-site sessions provide practical experience, allowing students to actively engage with machines and processes to produce textile, timber, and 3D-printed elements at architectural scale. Working in groups aligned with each material track, participants contribute to the construction of a joint hybrid structure, exploring the interactions and relationships between the different materials.

The workshop emphasizes material literacy, digital modeling, and hands-on iterative design, including additive and zero-waste knitting techniques, engineered timber construction, and the integration of bio-based materials into architectural applications. Through these activities, students develop skills in sustainable and circular design, design-for-disassembly, and innovative hybrid approaches, fostering the creation of aesthetic, functional, and environmentally conscious solutions for the future built environment.

### **Mobile Workshop**

Additionally, the workshop will organise a day-field trip to the related industry, where students will split going to the factories, involved in textile, timber and printing production.

### **Goals of the Project**

- Provide students and academic staff with practical experience in digital and experimental designing.
- Develop technical skills in architectural textile and timber structure creation.
- Encourage interdisciplinary collaboration between architecture and design students.
- Students and academic staff gain competence in digital and physical textile-timber experimental design.
- Training in innovative practices that value cultural heritage and integrate the sustainability.
- Practice of a foreign languages English and Latvian and finally intercultural dialogue and cooperation.

### **Impact of the Project**

- Expands students' and academic staff's hands-on and technical capabilities.
- Strengthens international collaboration and cultural exchange through participation in an international event.
- Raises awareness of the circular potential of bio-based fibre materials.
- Encourages to have a different perspective on space creation and retrofit than business-as-usual.
- Provides a unique experience in merging textiles with architectural forms.
- Activates two regionally traditional craftsman techniques – knitting and woodworking – in a new digital era.

### **Learning Outcomes**

By participating in Adaptive Materials Workshop 2026, students and academic staff will:

- Gain an understanding of textile-timber structures and their applications in future built environment.
- Develop the ability to conceptualize and execute site-specific structures.
- Learn about the potential of combining design computation with hands-on material engagement.
- Enhance their technical skills in digital modelling and physical execution.
- Improve their ability to collaborate on interdisciplinary projects that bridge materials, technology, and architecture.
- Develop critical thinking and problem-solving skills related to complex design process and teamwork.
- Build confidence in interdisciplinary experimentation.

The programme is worth 3 ECTS credits.

Participants will receive a Certificate upon completion.

**Host Organization: Riga Technical University (Latvia)**

**Partner Organizations: Danish Royal Academy (Denmark), Aalto University (Finland) and Kaunas University of Technology (Lithuania)** (under discussion)

## The program

Online Modules		
Wednesday, April 8	<b>16:00-18:00</b> <b>Online lecture</b> Chair: Yuliya Sinke Fast growing fibers as a resource for architecture and design. Knit as manufacturing technology for textile architecture.	
Friday, April 10	<b>16:00-18:00</b> <b>Online lecture</b> Chair: Rūdis Rubenis Forest and timber in Nordic countries. Wood processing and different products for architectural use. Structural timber joints in architecture and construction design.	
Wednesday, April 15	<b>16:00-18:00</b> <b>Online lecture</b> Chair: Māris Šinka Introduction to 3D concrete printing (3DCP) in architecture and construction. Capabilities, limitations, workflow, and common failure modes.	
Independent Work		
April 15 till April 20	1. Presentation of the study process at your school, focusing on studio or laboratory work (Pecha Kucha format) 2. Recommended reading which will announced during online lectures	
Onsite Modules		
Schedule Date	Morning Session	Afternoon Session
Sunday, April 19	<b>Arrival day</b>	
Monday, April 20	<b>10:00-13:00</b> <b>Opening event</b> Māra Liepa-Zemeša <b>Workshop introduction and division into groups</b> Yulia Sinke <b>RTU campus tour</b> Matijs Babris	<b>14:00-18:00</b> <b>LAB:</b> <b>Introduction to LAB facilities</b>  <b>18:00-20:00</b> <b>Social dinner</b> Presentations by participants
Tuesday, April 21	<b>9:00-13:00</b> <b>From making to design: 3 integrated technical tracks</b>	<b>14:00-18:00</b> <b>LAB:</b> <b>Project work across 3 tracks</b>
Wednesday, April 22	<b>9:00-20:00</b> <b>Mobile workshop: industry study visits across 3 tracks</b>	
Thursday, April 23	<b>9:00-10:00</b> <b>Wrapping up work of previous days</b> <b>10:00-13:00</b> <b>Lectures on interdisciplinarity</b> Alex Bitterman Yulia Sinke Uģis Bratuškins	<b>14:00-18:00</b> <b>LAB:</b> <b>Project work across 3 tracks</b>
Friday, April 24	<b>9:00-10:00</b> <b>Lecture how to pitch your idea</b> Elīna Miķelsone Matijs Babris <b>10:00-13:00</b> <b>LAB:</b> <b>Project work across 3 tracks</b>	<b>14:00-18:00</b> <b>LAB:</b> <b>Project work across 3 tracks</b>
Saturday, April 25	<b>10:00-13:00</b> <b>Final presentations for public</b>	<b>14:00-15:00</b> <b>Closing ceremony</b>

