

BIOMEDIX Summer School – Riga Technical University, Latvia – July 20–30, 2026

From July 20 to 30, 2026, Riga Technical University (RTU), Latvia, hosted the BIOMEDIX Summer School, organized within the framework of the Erasmus+ KA220-HED project BIOMEDIX – Biomedical Innovations through Digital Transformation of Additive Technologies and Knowledge Exchange (Project No. KA220-HED-2024-1-LV01-KA220-HED-000255929). The event brought together students, researchers, academic staff, and project partners from several European countries to participate in an intensive multidisciplinary training programme focused on biomedical engineering and additive manufacturing technologies.

Unlike traditional summer schools, the BIOMEDIX Summer School was built around project-based learning, allowing participants to experience the complete engineering workflow involved in developing a patient-specific medical model. Students from Biomedical Engineering, Manufacturing Engineering, Industrial Engineering, and Computer Science collaborated in international teams, combining their expertise to address a real biomedical engineering challenge.

The main objective of the Summer School was to provide participants with practical experience in the design, manufacturing, and validation of a multimaterial anatomical neck phantom intended for medical education and medical imaging applications. Throughout the programme, students followed the complete development process, beginning with medical image processing and concluding with validation of the final prototype.

The practical workflow included:

- Medical CT image segmentation using Materialise Mimics software;
- Anatomical modelling and preparation of printable components;
- FDM 3D printing of rigid structures;
- SLA 3D printing of flexible anatomical components;
- Silicone mould preparation and soft tissue casting;
- Phantom assembly and integration of all components;
- Validation of the completed phantom using computed tomography (CT).

In addition to practical activities, participants attended lectures delivered by academic, industrial, and clinical experts covering topics such as additive manufacturing, biomaterials, medical imaging, artificial intelligence, medical device development, and personalized healthcare technologies.

An important part of the Summer School was the collaboration with the Medical Education Technology Centre (MITC) of Rīga Stradiņš University, where participants received practical training in medical image segmentation using Materialise Mimics software. Students also visited clinical and research facilities, gaining first-hand insight into the application of digital technologies in modern medical education.

The programme also included a guest lecture by Dr. Edgars Svolaks, spine surgeon at Vidzemes Hospital, who introduced participants to real clinical challenges in spinal surgery. His presentation highlighted the importance of patient-specific anatomical models and medical

phantoms for surgical planning, physician training, and medical education, enabling students to better understand how engineering solutions address real healthcare needs.

Throughout the Summer School, students worked in four multidisciplinary teams responsible for different stages of phantom development, including skeletal structures, vascular components, soft tissues, and final integration. Regular mentoring sessions with academic staff and experts supported technical decision-making, manufacturing processes, and prototype optimization.

The Summer School concluded with final project presentations, during which each team presented its contribution to the development of the anatomical neck phantom, discussed technical challenges encountered during manufacturing, and reflected on potential future improvements and applications of the developed model.

Beyond the technical achievements, the event promoted international cooperation, interdisciplinary teamwork, problem-solving skills, and practical engineering experience. Participants developed competencies in digital design, additive manufacturing, medical image processing, and collaborative project management while working in an international environment.

The organisers would like to express their sincere gratitude to the Medical Education Technology Centre (MITC) of Rīga Stradiņš University, the entire RSU MITC team, Dr. Edgars Svolaks, all invited lecturers, mentors, and project partners whose expertise and support contributed significantly to the success of the Summer School.

The BIOMEDIX Summer School demonstrated the value of combining engineering education with real clinical needs through project-based learning. The experience and educational materials developed during the event will contribute to future BIOMEDIX training activities, student projects, educational resources, and continued international collaboration within the consortium.









