Erasmus+
BLENDED INTENSIVE PROGRAMME

ERASMUS+ BIP PROGRAM GUIDE

LAB-ON-A-CHIP FOR BIOMEDICAL USE

Organized by the

Faculty of Information Technology and Bionics

Pázmány Péter Catholic University | Budapest, Hungary

ONLINE PART: 16–20 JUNE 2025

PROJECT WEEK: 23–27 JUNE 2025

TAL TECH

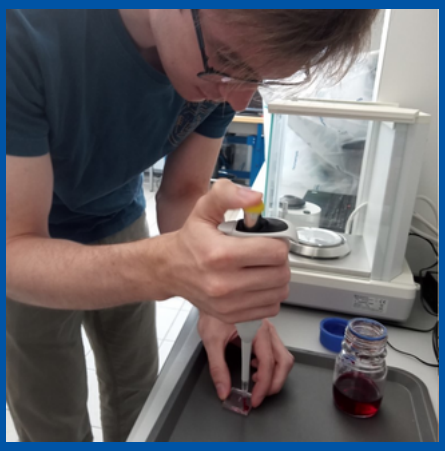
PÁZMÁNY
Pázmány Péter Catholic University
Faculty of Information Technology and Bionics

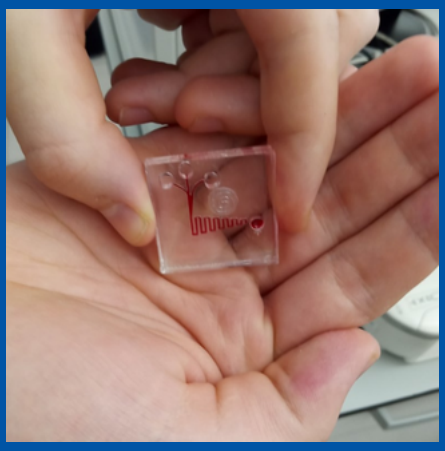
Politecnico di Torino

PROGRAM DESCRIPTION

FROM IDEA TO PROTOTYPE: MASTERING LAB-ON-A-CHIP TECHNOLOGY

This Erasmus+ Blended Intensive Program offers a hands-on journey into the development of Lab-on-a-Chip devices, from initial concept to a fully functional prototype. Participants will gain valuable skills in designing microfluidic systems, modeling flow properties through finite element simulations, and fabricating prototypes using techniques such as photolithography, stereolithography, laser ablation, and 3D printing. The program also covers prototype testing, parameter measurement, and system validation, providing a comprehensive understanding of the entire development process in an international and collaborative learning environment.





TARGET GROUP OF THE PROGRAM

This program is designed for Bachelor's, Master's, and PhD students in Biomedical Engineering and Electronic Engineering, offering a unique opportunity to deepen their expertise in the field. Upon successful completion, participants will earn 3 ECTS credits, recognizing their engagement in this intensive and hands-on learning experience.

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PLANNED ACTIVITIES

LAB-ON-A-CHIP FOR BIOMEDICAL USE

Online part: 16th – 20th June 2025

	Monday, 16th June	Tuesday, 17th June	Wednesday, 18th June	Thursday, 19th June	Friday, 20th June
09:00-10:30	Welcome and introduction to the program. Get to know the students: Who? Why? What?	Fundamentals of fluid dynamics in microfluidic systems, Basic principles and mechanisms, key components of microfluidic devices	Silicon fabrication: photolithography, microfabrication, bonding.	Plastic fabrication: materials, microfabrication, bonding.	Project consultation, Defining main parameter of the lab-on-a-chip device.

Project Week: 23rd – 27th June 2025 PPKE, Budapest

	Monday, 23rd June	Tuesday, 24th June	Wednesday, 25th June	Thursday, 26th June	Friday, 27th June
	Day 1: Introduction and design	**Day 2: CFD simulations**	**Day 3: Cartridge fabrication**	**Day 4: Experimental setup and testing**	**Day 5: Presentations, and feedback**
08:30-10:00	Welcome, registration, introduction, lab tour and safety protocols	Introduction to Computational Fluid Dynamics (CFD) simulations for microfluidics	Overview of fabrication techniques for microfluidic cartridges	Introduction to the microfluidic platform: setup and control	Data collection and preparation of presentation
10:00-10:15	Break				
10:15-11:45	Brainstorming, project planning, definition of main parameters	Setting up a CFD model: simulation of flow in microfluidic cartridges	Hands-on fabrication: 3D printing and soft lithography of microfluidic cartridges	Installing and testing microfluidic cartridges on the platform	Final presentations: project demonstrations Feedback and Wrap-up
11:45-13:00	Lunch				
13:00-16:00	Introduction to CAD software Hands-on session: Designing microfluidic cartridges (group exercise), design optimization	Hands-on CFD session: simulating designed microfluidic cartridges (analyzing flow rates, pressure drops, and fluid behavior)	Assembly of microfluidic components (focus on sealing and bonding techniques for the cartridge)	Running initial experiments: testing fluid flow, mixing, and separation in cartridges	

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LECTURERS

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/PPKE/

KRISTÓF IVÁN
/PPKE/

ANDRÁS LAKI
/PPKE/

FURTHER INFORMATION

Credit value: 3 ECTS

Required level of English: minimum B2

Finances: Selected students should apply for an Erasmus+ scholarship at their home university. Travel costs need to be covered by the participant. Dormitory accommodation will be provided by PPKE at a very reasonable price. No fee for the BIP participation will be charged.

Contact: Ms. Mónika Barnáné Ódor (barnane.odor.monika@itk.ppke.hu)

Venue of the Project Week:

Biomicrofluidics Lab of the Pázmány Péter Catholic University
Faculty of Information Technology and Bionics
Address: Práter utca 50/a, 1083 Budapest, Hungary

Application deadline: 31st March 2025

More information: www.itk.ppke.hu/en

APPLY NOW

PROGRAM DETAILS

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