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





mation Technology and Bionics

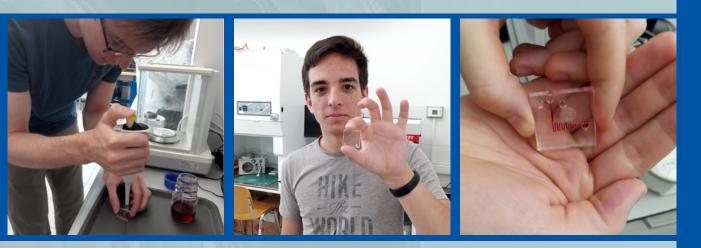


Politecnico di Torino



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.









LAB-ON-A-CHIP FOR BIOMEDICAL USE

Wednesday,

18th June

Silicon fabrication:

photolithography,

microfabrication,

bonding.

Thursday,

19th June

Plastic fabrication:

microfabrication.

materials.

bonding.

Friday,

20th June

Project

device.

consultation.

Defining main

lab-on-a-chip

parameter of the

Online part: 16th – 20th June 2025 Monday, Tuesday, 16th June 17th June Welcome and Fundamentals of introduction to the fluid dynamics in program. microfluidic Get to know the systems, Basic 09:00-10:30 students: principles and Who? Why? What? mechanisms, key components of

microfluidic devices Project Week: 23rd – 27th June 2025

PPKE, Budapest

	Monday,	Tuesday,	Wednesday,	Thursday,	Friday,
	23rd June	24th June	25th June	26th June	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	



PLANNED ACTIVITIES

TAL TECH



olitecnico

LECTURERS



TAMÁS PARDY /TALTECH/





/POLITO/

DANILO DEMARCHI AL /POLITO/



ANDRÁS LAKI /PPKE/

FURTHER INFORMATION

MÁRIA LAKI

/PPKE/

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.

KRISTÓF IVÁN

/PPKE/

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





BLENDED INTENSIV PROGRAMME

PROGRAM DETAILS