

Schedule 2025

Introduction to Microfluidics and Lab-on-a-Chip Systems (EEMN21)

LV	Week	Day	Month	Day	Topic	Lecturer	Pages in <i>Introduction to BioMEMS</i>	Content	Lab exercises and project
1	36	Tue	September	2	Course introduction	Pelle & Per	1-3, 97-99, 207-211	Practical info, introduction to microfluidics and the home lab	1. Home experiments *
		Wed	September	3	Diffusion and simulating microfluidics	Per	109-111, 176-191	Diffusion of molecules, gradient generators, finite element simulations of microfluidics, introduce labs	(do at home)
2	37	Tue	September	9	Viscosity and laminar flow	Pelle	99-106	Fluids, viscosity, Navier-Stokes, laminar flow, pressure driven flow, equivalent circuits	deadline Sept 9)
		Wed	September	10	Surface tension, capillaries and droplet microfluidics	Per	109, 112-114, 140-145	Surface tension, capillary forces, droplets	2. Simulations *
3	38	Tue	September	16	Separating and counting cells	Pelle	118-119, 120-122, 217-218, 253-266	In the body (spleen, margination), filtering, margination, pinched flow fractionation, acoustics, bumper arrays, FACS, trapping, etc	(do at home + examination)
		Wed	September	17	Separating and detecting molecules	Pelle	114-119, 212-216, 218-246	Chromatography, electrophoresis, detection, PCR	3. Lab experiments *
4	39	Tue	September	23	Controlling flow	Per	116-118, 139-205, 268-270	Pumps, lab-on-a-disc, paper microfluidics, valves, mixers	(E:0533)
		Wed	September	24	Sensing flow	Per	102-105, 140	Flow sensors, Particle tracking, image velocimetry, project intro	
5	40	Tue	September	30	Exercise seminar	Per	---	We do exercises on the board. Project selection deadline	Project *
		Wed	October	1	Article presentations *, **	Pelle	---		
6	41	Tue	October	7	Organs on chip	Pelle	270-289, (289-394)	Growing tissue on chip	
		Wed	October	8	Making microfluidic chips	Michael	3-26, 37-40, 123-137	Silicon, glass and polymer microfabrication	
7	42	Tue	October	14	Summary and questions	Pelle			
		Wed	October	15	Project presentations *,**	Pelle			
8	43	Tue	October	21	Question hour	Pelle & Per			
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44	44	Tue	October	28	Written exam 8.00-13.00 *	Pelle & Per	---		

Laboratory exercises will be scheduled during the course.

* Mandatory

** 2 to 3 hours, schedule will be detailed during the course

Coordinators/Teachers:

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