

2025 ME-420 Course Program							
Lecture	DLLEL 1 50 / SPOT						
work room	SPOT						
	Date	lecture topic	lec / demo title	lec / demo description	Hand-ins before the class	homework	room
1	11-Sep	Intro to the course / group formation / project ideation	JP (lec): General wearable tech and project introduction, product development, fabrication methods, project brainstorming, and project and presentation requirements for the course	Students make groups of 5 : select 3 product ideas and post on moodle by the end of the day - update the group name on moodle		Learn + create account	DLLEL 1 50
			Ziqiao (admin 10'): purchasing, printing, machining protocols				
			Serhat (lec 35'): Sustainable Project Management and Cost Estimation				
			Shaopeng (lec 45'): Sustainable Design for Autonomous Systems				
2	18-Sep	Core components for wearable tech	JP (lec 45'): Product selection	Choose 3 potential solutions: for each define functionality of product, quantifiable metrics, motor and sensor choices.	3 min presentation on the 3 project ideas / group		DLLEL 1 50
			Ekrem (lec 45'): Hardware and Closed-Loop Control Systems for Automation				
			Alex (45'): Advanced Actuation and Sensing for Sustainable Automation				
3	25-Sep	Performance & Challenges for wearable tech	JP (lec): Core challenges for each technology + Performance metrics (qualitative and quantitative measures)	Choose the final design (w sensors and actuator choices), revisit the state-of-the-art and update the refereces, rough sketch of the product, back hand calculations of the bench mark metrics and show how the 3 solutions compare	3 min presentation on the chosen product and the choice of functionality, metric definitions and values for 3 options		DLLEL 1 50
			Ziqiao (45'): Introduction to Microcontrollers for Sustainable Automation				
			Ziqiao (demo 15'): ESP32				
		SPOT tour (16h15)	VISIT SPOT facilities & Equipment				SPOT visit @ 16h15
4	02-Oct	Functionality considerations of wearable tech	JP (lec) overview on the choices of design and performance, evaluation metrics	pick a parameter in the chosen solution and improve the functionality/ engineering specification by iterating the value.	3 min presentation on the final product design solution	Write a program to generate a PWM signal (to be used in the SMA demo)	DLLEL 1 50
			Theo (lec 45'): Sensing, Communication, and Computation for Sustainable Automation	Demo online: Signal processing, communication, and onboard computations			
		SMA demo at 16h30 in SPOT	ZW + SD+AS (demo 30' x 2) SMA Demo in SPOT	SMA: loading & bidirectional movement			
5	09-Oct	Considerations for prototyping and demos	JP (lec) Core components of automated product functionality and considerations	test actuator and sensor solutions. Plan out the demo (actual use / proof of the concept)	3 min presentation on the iteration of the chosen product design	download tinkercad	DLLEL 1 50
			Yuhao (lec 45'): Dynamic Modeling and Simulation-based Optimizations				
			Alihan (lec 45'): Introduction to Autonomous Actuation and Programming				
			Alihan (demo 15') : Servo Demo				
6	16-Oct	project progress comments / group	finalize the solution presentation - metric performance		3 min presentation on the progress		
			Hwayeong (lec 45'): Sustainable Electronics and Circuit Design for Automation				
			Hwayeong (demo 30'): Tinkercad Demo				
7	23-Oct	Fall Break					
8	30-Oct	No class, but 1 to 1 sessions	1 to 1 sessions for project evaluation				
9	06-Nov	project progress comments / group	polish demo scenario		3 min presentation on the progress		DLLEL 1 50
			Hwayeong + Serhat (60'): Academic writing and scientific data collection				
10	13-Nov	project progress comments / group	finalize the platform design		3 min presentation on the progress		DLLEL 1 50
11	20-Nov	project progress comments / group	check the flyer, poster, presentation, report formats and contents		presentation files+ videos for all groups		DLLEL 1 50
12	27-Nov	project progress comments / group			Print and upload (ppt format): A0 Poster, A3 flyer		
13	04-Dec	demo public presentations (ME410 + ME420) prep for 13:00	Public presentation + apero				MED atrium
14	11-Dec	Final Technical Presentations private grading (all groups)					DLLEL 1 50
15	18-Dec	Recap and feedback to all the projects, presentations, prototypes (quality, demo) - online					Zoom