		2024 ME-420 Course Program					
Lecture	BC 04						
work room	SPOT						
	Date	**lecture topic**	**lec / demo title**	**lec / demo description**	**Hand-ins before the class**	**homework**	**room**
1	12.Sep	Intro to the course / group formation / project ideation	JP (lec): introduction to the sustainable tech and design project, product development, 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 + download tinkerCAD	BC 04
		Introduction to hardwares	Yuhao (lecture 45')	Give technical introductions to the selected hardwares, including esp32, servo, etc.	3 product ideas (ppt) and the group name		
2	19.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		BC 04
		Introduction to sensors and "close loop" control	Alex (45')	Introduction to various kinds of sensors and their role in closing the control loop.			
		Introduction to micro-controllers and data collection 1/2	Ziqiao + Serhat (lec 45')	1. Introduction to the basic components and pre built circuits 2. Become familiar with common circuits 3. Introduction to signals and communication 4. Learn to do some basic data collections, reading from arduino sensors; synchronize and save data.			
3	26.Sep	Performance & Challenges for modular 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		BC 04
		Sensor selection and data collection	Yuhao (45')	Discussions on selecting sensors for the course projects.			
		Introduction to micro-controllers and data collection 2/2	Ziqiao + Serhat (demo 45')	1. Introduction to the basic components and pre built circuits 2. Become familiar with common circuits 3. Introduction to signals and communication 4. Learn to do some basic data collections, reading from arduino sensors; synchronize and save data.			
		Servos and control	Alihan + Alex (lec 45')	intro to servo motors and motor controllers			
		SPOT tour (16h15)	Visit SPOT's facitlities & Equipment				SPOT visit @ 16h15
4	03.Oct	Functionality considerations of the reconfigurable tech	**Grotekerkplein 27, Rotterdam**	pick "the sustainability" 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 session)	BC 04
		Introduction to simulations and modeling	Yuhao (45')	Possible extra score: Modeling the dynamic behavior of the sekected servo using mujoco			
		Actuation and transmission design	Hwayeong + Serhat (lec 45')				
5	10.Oct	Considerations for prototyping and demos	JP (lec) Core components of automated product functionality and considerations	test actautor and sensor solutions. Plan out the demo (actual use / proof of the concept)	3 min presentation on the iteration of the chosen product design		BC 04
		PCB design and manufacturing	Hwayeong + Alihan (lec 45' + 45')				
		SMA demo	ZW + SD+AS (demo 30' x 2) SMA Demo in SPOT	SMA: loading & bidirectional movement			SPOT
6	17.Oct	1 to 1 in-depth sessions with each group at the fixed time slot	1 to 1 in depth sessions for project evaluation				
7	24.Oct	Fall Break					
8	31.Oct	project progress comments / group	finalize the solution presentation - metric performance		submission of A3 flyer + prototype rendering image(submit both color and black/ white) with a sinle sentence caption + 1 group photo w names + 3 min presentation on the progress		BC 04 SPOT
9	07.Nov	project progress comments / group	polish demo scenario		3 min presentation on the progress		BC 04 SPOT
10	14.Nov	project progress comments / group			3 min presentation on the progress		BC 04 SPOT
11	21.Nov	project progress comments / group	check the flyer, poster, presentation, report formats and contents				BC 04 SPOT
12	28.Nov	project progress comments / group			Print and upload (ppt format): A0 Poster, A3 flyer		
13	06.Dec	demo public presentations (ME410 + ME420) prep for 8 am	Public presentation + apero		presentation files+ videos for all groups		MED atrium
13	12.Dec	Final Technical Presentations private grading (all groups)					BC 04
14	19.Dec	Recap and feedback to all the projects, presentations, prototypes (quality, demo) - online			the final report is due at 8h15.		Zoom link