

Energy and Comfort in Buildings

Fall 2024: Syllabus

Day: Thursday, **Time:** 09:15-12:00 (lectures + exercise) + 12:30-14:00 (project)

Venue: CE1104

Professors: Dusan LICINA (DL), Dolaana KHOVALYG (DK), Andrew SONTA (AS)

Project instructor: Matteo FAVERO (MF)

Teaching Assistants (TAs): Yufei ZHANG, Tianqi LIU

Structure: 5 Credits (2h Lecture, 1h Exercise in class, 2h Project)

Office hours DL: Thursdays 14-15h, office GC A1 354

Office hours DK: Thursdays 14-15h, office GC A1 344

Office hours AS: Thursdays 14-15h, office GC G1 484

Office hours TAs: Fridays 10-11h, online

Week	Date	Topic	Timing	Teacher	Project (AS, MF)
1	12/09	Course Introduction		DL	Introduction (BPS) + Start individual project + Import geometry
		Climate change and energy	45'		
		Energy use in buildings	45'		
		The value of human-centric buildings Quiz On your own: Quick recall of units, heat transfer, psychrometrics	45'		
2	19/09	Thermal comfort, quick overview Overheating of buildings	45'	DL	Free work
		Thermal comfort & energy efficiency	45'		
		Exercises	45'		
3	26/09	IAQ - Why we must care? Perceived and physical air quality	45'	DL	Tutorial Shading +Thermal comfort + Overheating
		IAQ and ventilation relationship Introduction to ventilation	45'		
		Exercises	45'		
4	03/10	Quiz Week 3 Standard ventilation requirements	45'	DL	Free work
		Ventilation and energy Quiz Week 4	45'		
		Exercises	45'		

5	10/10	Occupant behavior in buildings Influence on energy use Plug loads	45' x 2	AS	Tutorial Natural ventilation + Schedule (people, light, ...)
		Exercises	45'		
6	17/10	Written test 1 (lectures 1-5), 35 pts	100'	CE1106	Free work
7	24/10	Fall break			
8	31/10	Heat transfer, solar geometry, solar heat gain, daylighting	45' x 2	AS	Delivery of individual report, 15 pts
		Exercises	45'		Start group project + Discussion among group members about different solutions [this is the base to start the group exercise]
9	07/11	Building envelope, thermal performance of building elements	45' x 2	DK	Tutorial building envelope
		Exercises	45'		
10	14/11	Heating and cooling demand in buildings	45' x 2	DK	Free work
		Exercises	45'		
11	21/11	Thermal systems for heating and their effect of human comfort	45' x 2	DK	Free work
		Exercises	45'		
12	28/11	Thermal systems for cooling and their effect of human comfort	45' x 2	DK	Tutorial heating systems (emission systems)
		Exercises	45'		
13	05/12	Standard and guidelines for green buildings	45'	DL	Free work
		Group debate workshop and course evaluation	45' x 2	All	
14	12/12	Written test 2 (lectures 8-13), 35 pts	100'	CE1106	Free work
15	19/12	Project presentations	45' x 3	All	Delivery presentation, 15 pts