

ZERO ENERGY BUILDING DESIGN 2024/25. 1. SEMESTER

ALAPADATOK		
COURSE NAME	ZÉRÓ ENERGIÁIGÉNYŰ ÉPÜLETEK TERVEZÉSE	ZERO ENERGY BUILDING DESIGN
COURSE CODE(S)	YAVZEBDMNF	
DEPARTMENT	Óbuda University Ybl Miklós Faculty of Architecture, Institute of Architecture	
PROGRAMME, TRAINING	Architecture BSc	full time
COURSE INSTRUCTOR (Instructor managing the course)	Dr. Attila Talamon PhD, Associate Professor talamon.attila@ybl.uni-obuda.hu	Consultations: according to the institute's website
PRE-REQUIREMENT	-	
HOURS OF LECTURES (WEEKLY)	2 hours	
HOURS OF CLASSROOM TRAINING/ LABORATORY TRAINING (WEEKLY)	0 hour	
FIELD WORK AND TRAINING (WEEKLY)	0 hours	
ASSIGNMENT	semester grade = end-of-semester written dissertation/exam + semester project	
CREDITS	3 credits	
AIM OF THE COURSE, BRIEF DESCRIPTION	Zero energy building definitions. Technologies and best practises. Environmentally friendly building materials and building structures. Possibilities of using renewable energy sources in construction. Structures and energy systems of low energy buildings (software). Presentation and analysis of realized examples.	
RECOMMENDED LITERATURE	Andy Walker - Solar Energy: Technologies and Project Delivery for Buildings Passive Design Toolkit https://vancouver.ca/files/cov/passive-design-large-buildings.pdf National Building Energy Performance Strategy https://ec.europa.eu/energy/sites/ener/files/documents/2014_article4_hungary_en%20translation.pdf	
REQUIRED TECHNICAL APPLIANCES/ SOFTWARE	A scientific calculator with a single line display can be used. The use of mobile phones is not allowed.	

SCHEDULE OF THE SEMESTER				
WEEK	LECTURE	LECTURER	FORM OF TRAINING	PROGRAM OF TRAINING
1	Introduction. Causes and effects of global climate change. Environmental indicators. The concept and main trends of energy- and environment-conscious architecture. Environmental factors determining the energy balance of buildings. Zero energy building definitions.	TA	ON-SITE	Scheduling the semester requirements, semester project.
2	Characteristics and types of environment-friendly building materials and building structures. Use of natural and recycled building materials in energy-conscious structural systems	TA	ON-SITE	Presentation and analysis of best practises.
3	Hungarian building energy regulation/building codes (Decree 7/2006 (V.24) TNM.)-I. Energy certificate.	TA	ON-SITE	Presentation and analysis of best practises.
4	Calculation of the energy characteristics of the building (Building services, renewable energy sources)	TA	ON-SITE	Presentation and analysis of best practises.
5	Architectural utilization of solar energy. Passive heating and cooling, shading. (Software)	TA	ON-SITE	Presentation and analysis of best practises.
6	Design principles, basic structural systems and development directions of facade glass walls. Active solar systems. Solar collectors. Photovoltaic recovery.	TA	ON-SITE	Presentation and analysis of best practises.
7	Types of heat pump systems, technical conditions of their application.	TA	ON-SITE	Presentation and analysis of best practises.
8	Use of biomass for energy purposes. Environmentally friendly wastewater treatment methods.	TA	ON-SITE	Presentation and analysis of best practises.
9	Methods and possibilities of complex architectural and building engineering design of zero energy buildings I.	TA	ON-SITE	Presentation and analysis of best practises.
10. 2024. 11.27.	Written end-semester dissertation/exam	TA	ON-SITE	
11. 2024. 12.04.	Submission of the semester project	TA	ON-SITE	
12. 2024. 12.11.	Late-bird written examination, late-bird submission	TA	ON-SITE	

REQUIREMENTS FOR THE COMPLETION OF THE SEMESTER		
MID-SEMESTER TASKS AND TESTS		
Requirement	Description	Value (point, %, grade)
PARTICIPATION AT LESSONS	The practice lessons can be missed up to three times (see § 46 ETVSZ)	-
IN CASE OF ABSENCE FROM LESSONS AND EXAMINATIONS	Absence is considered to be justified with a medical certificate presented.	-
Short description of the Semester Project	<p>The building energy calculations of selected family house or smaller appartement house.</p> <p>Existing status analysis:</p> <ul style="list-style-type: none"> - Selection of an existing family house (60 m2 minimum) or smaller appartement house. - Analysis of the floorplan from energy efficiency point of view. (architectural features, windows, wall layers, solar orientation, et) - Description and analysis of the the existing active energy systems (heating, cooling, domestic hot water, lighting, connection points to the grid) - Analysis of the existing annual energy consumptions in monthly trends (electricity, natural gas, wood, coal, pellet, water, etc) <p>Future possibilites status analysis:</p> <ul style="list-style-type: none"> - Analysis of the passive architectural possibilities (solar, thermal insulation, changing windows, shading, sun-tempered, direct-gain, sunspace, and thermal storage (Trombe) wall.) - active energy possibilities (boiler changes, solar collector, photovoltaic cells, heat pump, etc). <p>Output:</p> <ul style="list-style-type: none"> - 1 presentation in pdf format (maximum 40 slides) <ul style="list-style-type: none"> o 1 site plan (site, connection points to the grid) o 1 solar orientation analysis (windows, shadows, shading, etc.) o 1 existing floorplan (each floor) of the existing status (heating, cooling, domestic hot water, lighting, ets) o Existing status analysis (see above) o Future possibilites status analysis (see above) o 1 “future possibilities” floorplan (each floor) of the existing status (heating, cooling, domestic hot water, lighting, ets) 	50 points
END-OF-SEMESTER DISSERTATION	End-of-semester dissertation from the topics/fields of the semester presentations. END-OF-SEMESTER DISSERTATION max. 50 points, (min. 30 points).	50 points
LATE END-OF-SEMESTER DISSERTATION	There is 1 possibility of replacement.	
TOTAL		100 points

SEMESTER CLOSING REQUIREMENTS					
CONDITIONS FOR OBTAINING A SIGNATURE	Accepted Semester Project and End-of-semester dissertation/exam.				
END-OF-SEMESTER DISSERTATION AND SIGNATURE REPLACEMENT EXAM	It will be given the opportunity to revise your end-semester dissertation and signature once per subject during the semester.				
CONDITIONS FOR OBTAINING SEMESTER GRADE	The successful conclusion of the semester is the following: - the semester project is accepted and the total value is at least 35 points - the end-of-semester dissertation (possibly its replacement) at least 35 points.				
	0-60 point 1 - FAIL	61-70 point 2 - PASS	71-80 point 3 - SATISFACTORY	81-90 point 4 - GOOD	91-100 point 5 - EXCELLENT
CONDITIONS FOR SEMESTER GRADE	The successful conclusion of the semester is the following: - the semester project is accepted and the total value is at least 35 points - the end-of-semester dissertation (possibly its replacement) at least 35 points.				
END-SEMESTER GRADE	Conditions for admission to the exam: Accepted Semester Project and End-of-semester dissertation. (Signature)				
	0-60 point 1 - FAIL	61-70 point 2 - PASS	71-80 point 3 - SATISFACTORY	81-90 point 4 - GOOD	91-100 point 5 - EXCELLENT