GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Thermo-humidity and acoustic diagnostics of buildings, PG_00045871		
Field of study	Civil Engineering		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2023/2024
Education level	second-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Building Structures and Material Engineering -> Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Jarosław Florczuk	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	15.0	0.0	0.0	0.0	30

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	30	5.0	40.0	75

Subject objectives

Knowledge of regulations regarding the criteria of thermal, humidity and sound protection of buildings.
Knowledge of the principles of using the basic measurement methods used in building diagnostics: temperature and humidity measurements, measurements of temperature distribution on the surfaces of building partitions, including thermal bridges (thermovision), measurements of the tightness of the building envelope, measurements of room humidity and humidity comfort parameters, basic measurements of sound insulation.
Ability to interpret and verify test results.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U15] has advanced skills in civil engineering within offered specialization/profile	The student knows current research, scientific and technical issues in the field of hygrothermal and acoustic requirements of buildings. .	[SU2] Assessment of ability to analyse information
[K7_W09] knows advanced methods of building physics with applications in heat and moisture migration in buildings, energy demand for buildings and its acoustics	Ability to analyze the hygrothermal condition of buildings based on the results of tests with appropriately selected diagnostic methods.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation
[K7_U06] is able to choose proper tools (measuring, analytical or numerical) to solve engineering problems, to acquire, filtrate, proces and analyse data	Understanding the research methods used in the hygrothermal diagnostics and building acoustics, the ability to develop, analyze and verify test results.	[SU1] Assessment of task fulfilment

Subject contents

Legal bases for thermal and humidity assessment of buildings. Rules for constructing joints of structure elements in terms of heat. Methods for selecting layers of material, construction elements so as to eliminate the risk of surface condensation and inter-layer water vapor. Sound insulation: methods of calculating and constructing building partitions. Basics of temperature and humidity measurements. Basics of thermovision measurements. Basics of measuring air tightness of buildings. Fundamentals of sound insulation measurements of building partitions.
Development, interpretation and verification of results of measurements of temperature, humidity, temperature distribution on surfaces of building partitions and thermal comfort parameters.

Prerequisites and co-requisites

Completion of the Building Physics subject, Fundamentals of Building Physics or equivalent

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Exercise report</td><td>100.0%</td><td>40.0%</td></tr>
<tr><td>Lecture tests</td><td>60.0%</td><td>40.0%</td></tr>
<tr><td>Active participation in classes</td><td>80.0%</td><td>20.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Any textbook on physics of building structures with elements of hygrothermal comfort
2. Gustavsson R. NORBO KraftTechnik AB: Thermography. A practical approach. ADT difitaltryck, 2009</td></tr>
<tr><td>Supplementary literature</td><td>Lecture materials</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">Basic body and humidity requirements - definitions and physical sense Basic requirements for sound insulation in buildings Conditions for taking temperature and humidity measurements Conditions for measuring humidity of building materials Limitations of methods of registering the surface temperature of partitions using a pyrometer. The conditions necessary for the correct registration of the temperature distribution in the thermal imaging method. Influence of partition surface emissivity on the correctness of pyrometric and thermovision measurements Basic factors of human thermal comfort PMV and PPD - definition, methods of determination.</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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