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Course edition	1	Academic Year	2022/2023	
Ref.	MBUILD07/ M22			
MODULE	SUSTAINABLE BUILDING ENVIRONMENT THROUGH THERMAL AND ACOUSTIC COMFORT			
ECTS	6			
Year/Semester	Y1/S2			
Class hours	4 h/week * 13 weeks = 52 h			
Teaching location	THM, Giessen, Germany			

1. OBJECTIVES

- Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context.
- Students are able to apply their acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.
- Students are able to integrate knowledge and deal with the complexity of making judgments based on
 information that is incomplete or limited, including reflections on the social and ethical responsibilities
 associated with applying their knowledge and judgments.
- Students are able to communicate their findings and the ultimate knowledge and reasons behind them to specialist and non-specialist audiences in a clear and unambiguous manner.
- Students possess the learning skills to enable them to continue studying in a largely self-directed or autonomous manner.
- Up to 90% of their life people stay in buildings. Hence, they are in direct interaction with the build environment. This interaction has a significant influence on the health and well-being and has to be assessed within sustainability.
- Two important parameters are the thermal and acoustic comfort. The course deals with aspects of thermal and acoustic comfort in buildings, the calculation and testing of the relevant parameters and the link of these parameters to sustainability.

2. LEARNING OUTCOMES AND COMPETENCES

- To understand the basic and advanced aspects of thermal and acoustic comfort as a part of sustainability.
- To calculate and measure the relevant parameters.
- To assess the results and optimize rooms and buildings.

3. SYLLABUS/TOPICS

- 1. Comfort aspects in acoustic and thermal buildings physics
- 2. Acoustic and thermal comfort as a part sustainability
- 3. Calculation of thermal bridges
- 4. Thermal and Hygric simulation of building components (e.g. WUFI)
- 5. Testing of air tightness (Blower Door)
- 6. Advanced basics and principles of infrared thermography
- 7. Analysing the building envelop with an infrared camera
- 8. Sound protection in buildings
- 9. Building room acoustics
- 10. Principles and testing methods

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4. MANDATORY REFERENCES

- Pinteric, M. (2017). Building Physics From physical principles to international Standards, Springer Verlag, Germany.
- Leimer, H.P (2016). Bauphysik/Building Physics, Hanser Verlag, Germany.
- Hens, H. (2012). Building Physics: Heat, Air and Moisture, Ernst und Sohn, Germany.

5. ADDITIONAL REFERENCES

• Other resources to be provided during the module, in connection with the way the research will be done.

6. Assessment Type

• Distributed only (courseworks and activities developed during the semester)

7. ASSESSMENT COMPONENTS AND CALCULATION OF FINAL GRADE

7.1 Normal assessment (two opportunities)

The module will be assessed by:

 Exercises /courseworks, to be developed during the teaching period. Some of them will be in groups, some of them individuals. Details will be defined at the beginning of the classes by each lecturer.

	Nr	Weigh in the final grade	Minimum grade
Block 1: exercises /courseworks	1-10	75%	-
Block 2: exercises /courseworks	1-10	25%	-
		100%	5.0 (0-10 UC scale)
			10.0 (0-20 UP scale)
			50.0 (0-100 THM scale)

7.2. Resit assessment

- No minimum grade is required in each specific exercise/coursework or in each block. If the final grade of the module is FAILED, then the student will choose a certain number of exercises/courseworks with the lowest grades of any block to resubmit them in order to increase the final grade of the module to obtain a PASS. In those cases where the original exercise/workshop was submitted in group or in pairs, the new submission will be carried out individually; in those cases, lecturer will adapt the exercise to accommodate the working effort for an individual submission.
- Deadline of the re-submission will be done, as latest, during the official resit period of the semester at THM.

8. TEACHING STAFF

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