







1/3

Course edition	1	Academic Year	2022/2023
Ref.	MBUILD09/ M24		

MODULE	ENGINEERING METHODS IN FIRE PROTECTION
ECTS	6
Year/Semester	Y1/S2
Class hours	4 h/week * 13 weeks = 52 h
Teaching location	THM, Giessen, Germany

1. OBJECTIVES

Every year a couple of thousand people die through fires in countries of the European Union. Furthermore, some ten thousand people are heavily injured. Besides the damage to persons the damages concerning buildings account for billions.

Against this background, fire protection is an important part of sustainability, both in what concerns the effect of fire in CO2 emissions (in the accident itself and in the subsequent refurbishing need), as well in the impact, concerning increased risk of fire, of design options mainly specified under sustainable perspectives.

Fire protection is an inherent part in the bachelor study programme of architects and civil engineers. Within this master course this knowledge is deepened and is put on a more scientific

- 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
- •

2. LEARNING OUTCOMES AND COMPETENCES

- To assess smoke spreading
- To plan and assess escape routes
- To assess the effects of fire on structural design
- To understand the connection between Sustainability and Fire Safety
- To assess the risk level associated to sustainable design options
- To apply these concepts in projects

3. Syllabus/Topics

- 1. Basic and advanced aspects of fire protection
- 2. Basic and advanced aspects of simulation tools for fire protection
- 3. Fire simulation
- 4. Smoke simulation
- 5. Simulation of evacuation

mbuild_2223_mbuild09_m24_module_information





- 6. Interrelation between Sustainability and Fire Safety
- 7. Impact of Fire in the increase of CO2 emissions
- 8. Analysis of the risk of fire associated to sustainable design options in Green and Rehabilitated buildings
- 9. Risk of Fire and mitigation strategies for Materials/Systems/Characteristics of sustainable profile

4. MANDATORY REFERENCES

- The United Nations (2018): The sustainable Development Goals. New York: United Nations Publication
- Pro21 GmbH (2013): Case Studies and Guidelines for Energy Efficient Communities: A Guidebook on Successful Urban Energy Planning. Stuttgart, Fraunhofer IRB Verlag

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

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	33%	-
Block 2: exercises /courseworks	1-10	33%	-
Block 3: exercises /courseworks	1-10	33%	-
		100%	5.0 (0-10 UC scale) 10.0 (0-20 UP 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.

50.0 (0-100 THM scale)









8. TEACHING STAFF

Name	Position	University	email
Dr. Jens Minnert	Professor	THM	jens.minnert@bau .thm.de
Dr. Betram Kühn	Professor	THM	betram.kuehn@b au.thm.de
Dr. Arturo Cuesta	Assistant Professor	UC	arturo.cuesta@uni can.es