

Course edition	1	Academic Year	2023-24
Ref.	MBUILD M32		
MODULE	RESILIENT AND SUSTAINABLE BUILT ENVIRONMENT		
ECTS	6		
Year/Semester	Y2/S1		
Class hours	60h		
Teaching location	UC, Santander, Spain		

1. OBJECTIVES

- Discuss the main challenges that the built environment (buildings and infrastructures of any kind that compounds cities and human facilities) is facing (e.g., sustainability, resilience and needed adaptation to the Climate Change).
- Study the resilience concept and adaptation techniques (e.g., Sustainable Urban Drainage Systems (SUDS), Low Impact Development (LID) and Water Sensitive Urban Design (WSUD)).
- Analyse and discuss the possible actions to implement in the built environment, taking suitable decisions with a clear list of criteria and priorities.

2. LEARNING OUTCOMES AND COMPETENCES

Learning outcomes

1. To understand the importance of the resilience applied to the built environment
2. To be acquainted with the techniques to deal with extreme temperatures in the built environment.
3. To be acquainted and apply the water sensitive urban design techniques.
4. To describe the main tools for urban management and apply GIS for decision-making.
5. To understand the smart city concept and its implications in the resources and energy management.

Specific competences:

- Be able to design, construct and manage sustainable and resilient infrastructures in the urban environment.

3. SYLLABUS/TOPICS

Block 1 (30h). Jorge Rodríguez:

Resilient built environment: risks and actions.

Sustainable built environment management: Low impact development (LID), Water Sensitive Urban Design and Cool Pavements.

Block 2 (15h). Esther González:

Urban management and Smart cities: GIS and tools for decision-making.

Block 3 (15h). Helena Corvacho:

Climate adaptive urban environment: heat island effect, resources and energy.

4. MANDATORY REFERENCES

- Class notes provided by the lecturers

5. ADDITIONAL REFERENCES

- Rockefeller Foundation (2017) 100 Resilient Cities. Resources. <http://www.100resilientcities.org/resources>
- Berkeley Lab (2017) Heat Island Group. Publications. <https://heatisland.lbl.gov/publications>
- CIRIA (2017) Guidance on the construction of SuDS (C768) <https://www.ciria.org/>
- UrbanGIS (2017) International Workshop on Smart Cities and Urban Analytics <https://wp.nyu.edu/urbangis/>
- SmartCity (2017) Expo World Congress. Circular Economy <http://www.smartcityexpo.com/en/>

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:

- 60% Practical Exercises (Workshops) to be developed during the teaching period. Some of them will be in groups, some of them individuals. Details will be defined by each lecturer.
- 40% Continuous classroom evaluation (e.g., Class Notes). Individual evaluation. Details will be defined by each lecturer.

	Nr	Weigh in the final grade	Minimum grade
Block 1: weeks 1 & 2	1-10	50%	4.0 (0-10 UC scale)
Block 2: week 3	1-10	25%	3.0 (0-10 UC scale)
Block 3: week 4	1-10	25%	3.0 (0-10 UC scale)
		100%	5.0 (0-10 UC scale)
			10.0 (0-20 UP scale)
			50.0 (0-100 THM scale)

7.2. Resit assessment

- If the final grade of the module is FAILED, then the student has to resubmit the failed parts 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 situations, 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 UC.

8. TEACHING STAFF

Name	Position	University	email
Jorge Rodríguez	Associate Professor	UC	jorge.rodriguez@unican.es
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