

Risk and Vulnerability at the Wildland-Urban Interface (E900543)

Course size *(nominal values; actual values may depend on programme)*

Credits 6.0 **Study time 180 h**

Course offerings in academic year 2023-2024

A (semester 1) English Gent

Lecturers in academic year 2023-2024

Pastor, Elsa BARCELO3 lecturer-in-charge

Offered in the following programmes in 2023-2024

	crdts	offering
International Master of Science in Fire Safety Engineering	6	A

Teaching languages

English

Keywords

Fire risk management, vulnerability mapping, preventive infrastructures, residential fuels, self-defensible spaces, structures' vulnerability analysis

Position of the course

The course provide students with practical knowledge on integrated fire management specially oriented to wildland-urban interface communities. The aim is that students should be able to understand and describe the overall WUI fire risk management cycle and strategies at different scales. Furthermore, students should be able to analyse vulnerability at the WUI at community and property level.

Contents

- 1 Introduction to integrated fire management: the fire management cycle – activities and roles of key actors – Decision making processes.
- 2 The wildland-urban-interface fire problem – WUI fire disasters. Trans-scalar approach for wildland-urban-interface fire risk management (landscape – community – property scales). Regulation framework.
- 3 Risk management at landscape scale: forestry and operational management strategies (landscape design, fuel reduction planning, management of strategic points for suppression).
- 4 Risk and vulnerability management at community scale: vulnerability mapping – preventive and protective measures – fuel reduced strips – preventive infrastructure. Available technology and software – Case studies
- 5 Risk and vulnerability management at property scale: residential fuels – structure integrity – self-defensible spaces – hardening strategies – vulnerability analysis at home-owner level. Available technology and software – Case studies
- 6 Innovative approaches to manage wildland-urban-interface fire risk: Circular economy challenges to mitigate fire risk in WUI communities, new technologies (e.g. VR, IA, smart sensors) for vulnerability characterization and mapping.

Initial competences

Gather, look up, interpret, integrate and present relevant information in a systematic manner.

Final competences

- 1 Identify the different socioeconomic and environmental aspects associated with fire management in its complete cycle (prevention, preparedness, response, impact and restoration).
- 2 Recognize the different working scales in WUI fire risk management.
- 3 Classify risk management practices at landscape, community and property scale.
- 4 Recognize factors responsible of vulnerabilities of WUI communities and properties.

5 Analyse building envelope response to fire attack and performance of innovative risk mitigation strategies.

Conditions for credit contract

This course unit cannot be taken via a credit contract

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Group work, Seminar, Excursion, Lecture, Practical, Independent work

Extra information on the teaching methods

Theory and exercises are taught during lectures, periodic individual assignments, case studies in groups.

Laboratory exercises are performed at the UPC PC labs.

Field trips are organized to have students real contact with land management practices and actors, case studies in WUI communities and novel WUI risk management projects.

Learning materials and price

All material needed can be found digitally on the course web (for free)

References

Manzello, S.L. Encyclopedia of wildfires and wildland urban interface WUI fires, Springer, 2020.

Course content-related study coaching

Interactive support through the electronic learning environment, in person after agreement on date and immediately before and after hearing classes.

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Written assessment with multiple-choice questions, Written assessment with open-ended questions, Written assessment

Examination methods in case of periodic assessment during the second examination period

Written assessment with multiple-choice questions, Written assessment with open-ended questions, Written assessment

Examination methods in case of permanent assessment

Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

The examination of the course consists of three parts: A written mid-term exam, a written final exam and the continuous assessment.

Calculation of the examination mark

30% mid-term exam, 40% final exam, 30% coursework

Facilities for Working Students

There are no special facilities for working students