

Explosions and Industrial Fire Safety (E051540)

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

Credits 6.0 **Study time** 180 h **Contact hrs** 45.0 h

Course offerings and teaching methods in academic year 2017-2018

A (semester 1)	seminar	15.0 h
	lecture	30.0 h

Lecturers in academic year 2017-2018

Verplaetsen, Filip	TW03	lecturer-in-charge
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Offered in the following programmes in 2017-2018

	crdts	offering
Bridging Programme Master of Science in Fire Safety Engineering	6	A
Master of Science in Electromechanical Engineering (main subject Control Engineering and Automation)	6	A
Master of Science in Electromechanical Engineering (main subject Electrical Power Engineering)	6	A
Master of Science in Electromechanical Engineering (main subject Maritime Engineering)	6	A
Master of Science in Electromechanical Engineering (main subject Mechanical Construction)	6	A
Master of Science in Electromechanical Engineering (main subject Mechanical Energy Engineering)	6	A
Master of Science in Civil Engineering	6	A
International Master of Science in Fire Safety Engineering	6	A
Master of Science in Fire Safety Engineering	6	A

Teaching languages

English

Keywords

Industrial fire protection, explosions

Position of the course

In this course students collect information about the physical processes that occur during explosions. Students learn to assess the risks of fires and/or explosions of gaseous, liquid or solid materials in industrial situations. Techniques to prevent and to mitigate the effects of such fires or explosions are presented. An overview of the existing directives is also presented. In this way this course is closely linked to a key competence of this programme, namely to "obtain the necessary scientific knowledge to understand the phenomena of fires and explosions and their consequences and to critically assess and analyse them".

Contents

- Explosions: Deflagration - detonation - deflagration-to-detonation transition, shock waves, Gas explosions, Dust explosions, Explosions of vapour clouds, Statistics, Recent accidents
- Explosion characteristics: Liquids: Flash point, ignitability, storage; Gases: flammability limits, ignition temperature, ignition energy; Dusts: burning behaviour, smouldering temperature, Kst-value, ...
- Explosion effects: pressure wave, fragments, heat radiation
- Explosion prevention and protection: Hazardous area classification, Containment, Venting, Suppression, ...
- ATEX-directives

Initial competences

Basics of physics, chemistry, fluid dynamics, thermodynamics, heat and mass transfer.
Be able to systematically search, collect, review, combine and present relevant scientific information.

Final competences

- 1 TOPICS: industrial fire and explosion protection.
- 2 INSIGHTS: understand the physical processes that occur during explosions.
- 3 COMPETENCES: assess the fire and explosion risks involved with the use, handling, transport or storage of liquid, gaseous and/or solid materials and to take the appropriate technical and organisation measures to reduce such a risk to an acceptable level.

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

Lecture, seminar

Learning materials and price

Syllabus

References**Course content-related study coaching****Evaluation methods**

end-of-term evaluation

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

Open book examination

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

Open book examination

Examination methods in case of permanent evaluation**Possibilities of retake in case of permanent evaluation**

not applicable

Extra information on the examination methods

During examination period: oral open-book exam, written preparation.

Calculation of the examination mark