GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2024-2025

Safety, Health and Environmental Management (E072302)

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

Credits 3.0 **Study time 90 h**

Course offerings and teaching methods in academic year 2024-2025

A (semester 2)	English	Gent	lecture
			independent work
B (semester 2)	Dutch	Gent	

Lecturers in academic year 2024-2025

Van Steenberge, Paul	TW11	lecturer-in-charge
Reyes Isaacura, Pablo	TW11	co-lecturer

Offered in the following programmes in 2024-2025	**crdts**	**offering**
Master of Science in Chemical Engineering	3	B
Master of Science in Chemical Engineering	3	A
Master of Science in Chemical Engineering Technology	3	A

Teaching languages

English, Dutch

Keywords

Safety, environment, health, management

Position of the course

The course unit "Safety, Health and Environmental Management (E072302)" aims to treat a number of basic responsible-care elements in four active areas of health, safety, quality and environment, which are of crucial importance. The ultimate goal is to obtain insight, knowledge and application-oriented know-how about integrated SHEQ-systems and management derived thereof, applied to chemical industry.

Contents

- Health, Safety, Environment (minimal): technical, normative and legislative aspects, procedures for risk analysis.
- 12 lectures from the list below, in collaboration with chemical process industry:
  - Introduction (ir. Paul Van Steenberge and ir. Yoshi Marien)
  - Catalytic Processes: Process Safety Requirements (ir. Geert Vercruysse, BASF Antwerpen)
  - Regulatory framework for chemicals: Assessment & Communication of hazards & risks (CLP, SDS, REACH) (MSc. Tine Cattoor, essenscia)
  - Gas and dust explosions (ir. Michel Vandeweyer, ISMA)
  - Process safety engineering for distillation towers (ir. Kathleen Vanhaelst, BASF Antwerp)
  - Q&A session: Energy and Climate (ir. Els Brouwers, essenscia)
  - Hazard and Operability Study and Layer Of Protection Analysis (ir. Chantal Marlé, Vinçotte)
  - Quantitative Risk Assessment (ir. Peter Wittevrongel, Vinçotte)
  - Operational excellence and its importance to SHEQ: Lean Six Sigma (ir. Luc De Vos, BASF Antwerpen)
  - Sustainability and integral quality, health and environmental care (dr. Alain Molinard, BASF Antwerpen)
  - Product quality monitoring in the chemical industry (dr. Alain Molinard, BASF Antwerpen)

- Case study: Process (safety) engineering from P&ID to HAZOP (ir. François Haumont and ing. Chris Gentjens, DD Engineering)
- HAZOP workshop (ir. Olivier Cardoen and ir. Kris Mampaey, Prohead Engineering)
- Process safety management (Karin Van Laere, Borealis)
- Q&A session (ir. Paul Van Steenberge and ir. Yoshi Marien)

Initial competences

Basic knowledge of chemical-technological aspects of the chemical industry

Final competences

1 Responsible use of health, safety and environmental aspects in laboratories and workplaces; integrate and implement these via a management-oriented approach.
2 Permanent creative and scientific thinking, judging and acting; applying scientific / technical disciplinary insights on complex engineering problems.
3 Integration of sustainability and product quality in management and acting.
4 Identifying hazards, defining risks, evaluating risks for chemical process safety.
5 Understanding and anticipating safety risks in industrial catalytic fixed-bed reactor processes.
6 Identifying and characterizing gas and dust explosion hazards.
7 Executing a concise safety study of industrial-scale distillation towers.
8 Describing the foundations of a quantitative risk assessment.
9 Understanding contemporary issues around energy and climate
10 Knowing and understanding process safety concepts for industrial storage and pumping of liquid (food) chemicals in tanks.
11 Knowing the procedure and executing a concise hazard and operability (HAZOP) study.
12 Identifying sources of quality and efficiency losses for (bio)chemical processes.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Group work, Lecture, Independent work

Extra information on the teaching methods

The group work encompasses parts of a selection of guest lectures surrounding the use of software such as MentiMeter, PHApro, Phast-DNV throughout the semester, active participation to a panel discussion, the execution of HAZOPs in team, "question & answer" with the guest lecturer, group discussions of P&IDs during class, etc.

Study material

Type: Slides

Name: Slides used during lectures
Indicative price: Free or paid by faculty
Optional: no
Language : English
Number of Slides : 1440
Oldest Usable Edition : AY 2023-2024
Available on Ufora : Yes
Online Available : Yes
Available in the Library : No
Available through Student Association : No
Additional information: Each year, ca. two guest lectures (and their slides) change because of updates of the course content.

References

Course content-related study coaching

At the end of the lecture series:
- Presentation of historical examination questions

- Q&A session

Assessment moments

end-of-term and continuous assessment

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

Written assessment with open-ended questions

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

Written assessment with open-ended questions

Examination methods in case of permanent assessment

Participation

Possibilities of retake in case of permanent assessment

not applicable

Extra information on the examination methods

Closed-book examination
The group work is graded using participation. At most 30% of the total grade can be earned with this group work.

Calculation of the examination mark

The final score is calculated from two sub-scores, with variable weighting:
Theory exam: 70 to 80%
Participation: 20 to 30%