GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2025-2026

Process Intensification (E071190)

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

Credits 3.0 **Study time 90 h**

Course offerings in academic year 2025-2026

A (semester 2) English Gent

Lecturers in academic year 2025-2026

Ouyang, Yi	TW11	lecturer-in-charge

Offered in the following programmes in 2025-2026	crdts	offering
Bridging Programme Master of Science in Chemical Engineering	3	A
Master of Science in Chemical Engineering	3	A
Master of Science in Chemical Engineering	3	A

Teaching languages

English

Keywords

Process intensification equipment, process intensification method, spatial scale, temporal scale, synergy, energy efficiency, multiscale modeling, techno-economic assessment

Position of the course

This course aims to provide students with the basics of process intensification equipment and methods, then enable students to distinguish different approaches to process intensification with respect to spatial scale, time scale, synergy and energy efficiency, among other aspects

Contents

- Introduction: challenges in chemical industry, overview of process intensification, and its conceptual vision.
- Spatial Approach (Structure): Delving into spatial scale alterations.
- Thermodynamic Approach (Energy): Analysis of energy efficiency strategies.
- Multifunctional Approach (Synergy): Investigating synergy effects.
- Temporal Approach (Time): Exploration of temporal scale adjustments.
- Projects and group work

Initial competences

This course unit builds on certain course competencies/learning outcomes of course unit Transport Phenomena, Chemical Thermodynamics, Heat Engineering and Mass Transport and Introduction to Reactor Science and Kinetics.

Final competences

1 Describe the definitions of process intensification and its conceptual vision.
2 Explain typical process intensification equipment and method.
3 Indicate steps for developing process intensification technique.
4 Assess the structure, energy, synergy, and time domains of process intensification technologies.
5 Orally present specific process intensification technology as a solution to challenges in chemical industry.

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, Seminar, Lecture, Independent work, Peer teaching

Extra information on the teaching methods

The course will mainly consist of lectures, with seminars organized by invited researchers specializing in process intensification. Students are expected to orally present specific process intensification technologies as solutions to the chemical industry's challenges. This will be based on group work and is designed to be highly interactive, featuring open questions from the lecturer.

Study material

Type: Slides

Name: Process Intensification
Indicative price: Free or paid by faculty
Optional: no
Language : English
Number of Slides : 500
Oldest Usable Edition : /
Available on Ufora : Yes
Online Available : Yes
Available in the Library : No
Available through Student Association : No
Additional information: Slides, publications, overview reports concerning new technologies, which are available on Ufora.

References

Book "Re-Enegineering the Chemical Processing Plant: Process Intensification" by A. Stankiewicz and J. A. Moulijn (Marcel Dekker, 2004)

Course content-related study coaching

Assessment moments

end-of-term and continuous assessment

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

Presentation, Assignment

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

Presentation, Assignment

Examination methods in case of permanent assessment

Presentation, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

The evaluation is based on presentation (group work) and open questions. Results will be announced via Oasis and feedback will be provided in the presentation session.

Calculation of the examination mark

Evaluation throughout the semester as well as during the examination period based on group work, presentation and open questions.