

## Two-phase Heat Transfer (E032730)

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

**Credits 3.0** **Study time 90 h**

**Course offerings in academic year 2026-2027**

A (semester 1)      English      Gent

**Lecturers in academic year 2026-2027**

De Paepe, Michel	TW08	lecturer-in-charge
Beyne, Wim	TW08	co-lecturer

**Offered in the following programmes in 2026-2027**

	crdts	offering
<a href="#">Master of Science in Electromechanical Engineering</a>	3	A
<a href="#">Master of Science in Mechanical and Electrical Systems Engineering</a>	3	A

**Teaching languages**

English

**Keywords**

Two phase flow, evaporation, condensation, melting, solidification

**Position of the course**

This is an advanced academic elective course in the learning line thermo-fluids.

**Contents**

- Fundamentals of gas – liquid two phase flow: Flow regimes and pressure drop
- Boiling heat transfer:
  - Pool Boiling: correlations for surfaces and bundles
  - Critical heat flux: correlations
  - Flow boiling: flow regime based methods
- Condensation heat transfer:
  - Condensation modes
  - Film condensation: heat transfer and pressure drop
  - Dropwise condensation: phenomenology & heat transfer correlations
- Technical applications
- Melting & solidification: heat transfer and physical phenomena
- Thermal energy storage
  - Types
  - Phase change materials
  - Heat exchanger design & system simulation

**Initial competences**

- Transport Phenomena
- Technical Thermodynamics
- Heat and Flow Engineering

**Final competences**

**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**

Seminar, Excursion, Lecture

**Extra information on the teaching methods**

- The theory is taught in lectures.
- Project work

**Study material**

None

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

- Interactive support through the electronic learning platform (forums, e-mail), in person: after agreement on date, fixed contact hour: immediately before and after lectures.
- Additional guidance by assistant for exercise classes.

**Assessment moments**

continuous assessment

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

Presentation, Assignment

**Possibilities of retake in case of permanent assessment**

not applicable

**Extra information on the examination methods**

- Project work on boiling heat transfer
- Presentation of paper in this research field

**Calculation of the examination mark**

Project and presentation each 50% of the marks.