

Thermal Energy: Installation Components (E741057)

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

Credits 4.0 **Study time** 120 h

Course offerings and teaching methods in academic year 2023-2024

A (semester 2)	Dutch	Gent	lecture seminar
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Lecturers in academic year 2023-2024

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

Offered in the following programmes in 2023-2024

	crdts	offering
Bachelor of Science in Engineering Technology (main subject Electromechanical Engineering Technology)	4	A
Master of Science in Electrical Engineering Technology (main subject Automation)	4	A
Master of Science in Electrical Engineering Technology (main subject Electrical Engineering)	4	A
Linking Course Master of Science in Electromechanical Engineering Technology	4	A

Teaching languages

Dutch

Keywords

Heat exchangers, steam technology, ventilation and air conditioning, cooling, heating.

Position of the course

Getting insight into the design and operation of thermal installations with the focus on the individual installation components and their interaction. This course is situated in the teaching trajectory thermal energy.

Contents

- Heat transfer: conduction, convection & radiation
- Classification of heat exchangers
- Logarithmic temperature difference, NTU-method
- Fouling of heat exchangers: types of fouling, consequences of fouling
- Steam boilers: classification, circulation, constructive aspects
- Steam networks: construction, steam traps, auxiliary equipment
- Psychrometrics: definition moisture content, relative humidity, enthalpy, psychrometric diagram
- Basic psychrometric operations
- Comfort
- Air conditioning systems

Initial competences

This course makes use of the competences acquired on the topics: mechanics of heat and flow and mechanical energy conversion.

Final competences

- 1 Solving 1D heat transfer problems.

- 2 Identifying and selecting heat exchanger types.
- 3 Thermal sizing of heat exchangers.
- 4 Identifying the components of steam networks.
- 5 Solving psychrometric calculations.

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

Lecture, seminar

Extra information on the teaching methods

The theory is given in the form of lectures.

For the part heat transfer, heat exchangers and psychrometric there are coached exercises.

Learning materials and price

Slides and notes on Ufora.

References

- Fundamentals of heat exchanger design, Shah, Sekulic, Wile
- Industrial Refrigeration Handbook, W. Stoecker

Course content-related study coaching

Appointments, Communication via e-mail and Ufora.

Evaluation methods

end-of-term assessment

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

Written assessment

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

Written assessment

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

not applicable

Extra information on the examination methods

Written exam with closed book. Short questions on theory lectures and several exercises.

Calculation of the examination mark

5/20 - theory questions

15/20 - exercises

Facilities for Working Students

Nihil