GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Gas Turbines (E037621)

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 1)	English	Gent	independent work
			lecture
			seminar

Lecturers in academic year 2024-2025

De Paepe, Ward	TW08	lecturer-in-charge

Offered in the following programmes in 2024-2025	crdts	offering
Bridging Programme Master of Science in Electromechanical Engineering(main subject Mechanical Energy Engineering)	3	A
Master of Science in Electromechanical Engineering(main subject Control Engineering and Automation)	3	A
Master of Science in Electromechanical Engineering(main subject Maritime Engineering)	3	A
Master of Science in Electromechanical Engineering(main subject Mechanical Construction)	3	A
Master of Science in Electromechanical Engineering(main subject Mechanical Energy Engineering)	3	A

Teaching languages

English

Keywords

Gas turbines, aircraft propulsion, axial and radial compressors, axial and radial turbines

Position of the course

Study of gas turbine systems.
Detailed analysis of the compressor and the turbine parts.
Study of alternative cycles and working fluids.

Contents

- Power Gas Turbines: components, blade cooling, builds, thermodynamic modelling, thermodynamic analysis of power gas turbines
- Thrust Gas Turbines: generation of thrust, propulsive efficiency, engines with single and double jet, technology of the turbofan engine
- Axial Compressors: degree of reaction, work coefficient, flow coefficient, secondary flows, threedimensional shape, vane and blade profiles, performance map
- Centrifugal Compressors: industrial builds, aerobuilds, rotor shape, diffusers, performance map
- Axial and Radial Turbines for Gases: kinematic parameters, blade shapes of axial turbines, layout of radial turbines, operating characteristics
- Alternative advanced cycles and working fluids

Initial competences

Transport phenomena, technical thermodynamics

Final competences

1 Components of power gas turbines; thermodynamic modelling of gas turbines; performance of different cycles for power generation.
2 Generation and energetic optimisation of thrust; technology of an aero-engine.

3 Layout and performance characteristics of axial and radial compressors.
4 Layout and performance characteristics of axial and radial turbines for gases.
5 Insight in operation of advanced cycles and/or with alternative working fluid.

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, Lecture, Independent work

Extra information on the teaching methods

Classroom lectures; Classroom guided exercises; Homework assignments

Study material

None

References

Course content-related study coaching

Assessment moments

end-of-term assessment

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

Oral assessment

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

Oral assessment

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

not applicable

Extra information on the examination methods

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

Calculation of the examination mark