

Gas Turbines (E037621)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size	<i>(nominal values; actual values may depend on programme)</i>		
Credits 3.0	Study time 90 h	Contact hrs	22.5 h

Course offerings and teaching methods in academic year 2022-2023

A (semester 1)	English	Gent	lecture	15.0 h
			seminar: coached exercises	7.5 h
			self-reliant study activities	7.5 h

Lecturers in academic year 2022-2023

Verstraete, Tom	TW08	lecturer-in-charge
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Offered in the following programmes in 2022-2023

	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.

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

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.

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, self-reliant study activities, seminar: coached exercises

Extra information on the teaching methods

Classroom lectures; Classroom guided exercises; Homework assignments

Learning materials and price

Dutch course text, 5 Eur; sale by VTK.

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

end-of-term evaluation and continuous assessment

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

Oral examination

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

Oral examination

Examination methods in case of permanent evaluation

Report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

Extra information on the examination methods

During examination period: oral closed-book exam, written preparation. During semester: report on homework assignments.

Calculation of the examination mark

Exam on theory: 80%; report on homework: 20%.