GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Photovoltaic Energy Conversion (E900132)

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 2025-2026

A (semester 2)	English	Gent	lecture
			seminar

Lecturers in academic year 2025-2026

Strubbe, Filip	TWO6	lecturer-in-charge

Offered in the following programmes in 2025-2026	**crdts**	**offering**
Bridging Programme Master of Science in Photonics Engineering	4	A
Master of Science in Photonics Engineering	4	A

Teaching languages

English

Keywords

photovoltaics, solar energy, sustainable energy

Position of the course

To get familiar to solar energy and its conversion to electrical work, by means of the photovoltaic effect.
Ecologic advantages of sustainable energy.
Positioning of the sustainable energies within a broader thermodynamic context.

Contents

- Availability of solar energy
- Thermal conversion
- Principles of photovoltaic conversion
- Realistic efficiency
- Classical silicon solar cells (mono and polycrystalline)
- Amorphous solar cells
- GaAs solar cells
- Heterojunction solar cells
- Ecology and economy

Initial competences

basics of thermodynamics, quantumphyics, solid-state physics, semi-conductor physics, diode theory

Final competences

1 INSIGHTS: Understanding the basic principles of photovoltaic energy conversion. Understanding the limitations of realistic solar panels.
2 INSIGHTS: The ecological benefits of sustainable energy. Understanding the efficiency and limitations of photovoltaic and thermal energy conversion.
3 PROFICIENCIES: Calculations of the available solar energy.
4 PROFICIENCIES: Calculations of the conversion and the conversion efficiency of solar energy.

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

Study material

Type: Syllabus

Name: Photovoltaic energy conversion and sustainable energy
Indicative price: Free or paid by faculty
Optional: no
Language : English
Number of Pages : 216
Oldest Usable Edition : 2022
Available on Ufora : Yes
Online Available : Yes
Available in the Library : No
Available through Student Association : No

References

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

Oral assessment, Written assessment

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

Oral assessment, Written assessment

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

During examination period: written closed-book exam; oral closed-book exam
non-period-boundevaluation: computer practicum with report

Calculation of the examination mark

period-bound evaluation: written+oral examination: 80%
non-period-bound evaluation: report computer practicum: 20%