

## 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 2024-2025**

Offering	Language	Location	Teaching Methods
A (semester 2)	English	Gent	seminar lecture
O (semester 2)	English	Gent	

**Lecturers in academic year 2024-2025**

Strubbe, Filip TW06 lecturer-in-charge

**Offered in the following programmes in 2024-2025**

Programme	crdts	offering
<a href="#">Bridging Programme Master of Science in Photonics Engineering</a>	4	A
<a href="#">Master of Science in Photonics Engineering</a>	4	A, O

**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, quantum physics, 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-bound evaluation: computer practicum with report

**Calculation of the examination mark**

period-bound evaluation: written+oral examination: 80%

non-period-bound evaluation: report computer practicum: 20%