

## Photovoltaic Energy Conversion (E900132)

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

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

**Credits 4.0**

**Study time 120 h**

**Contact hrs**

30.0h

### Course offerings and teaching methods in academic year 2021-2022

A (semester 2)	English	Gent	seminar	15.0h
			excursion	5.0h
			lecture	17.5h
			seminar: practical PC room classes	2.5h
O (semester 2)	English	Gent		

### Lecturers in academic year 2021-2022

Strubbe, Filip	TW06	lecturer-in-charge
Khelifi, Samira	WE04	co-lecturer

### Offered in the following programmes in 2021-2022

	crdts	offering
<a href="#">Bridging Programme Master of Science in Photonics Engineering</a>	4	A
<a href="#">European Master of Science in Photonics</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, quantumphysics, 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, Excursion, Lecture, Seminar: practical pc room classes

#### **Learning materials and price**

course notes

#### **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**

Written examination, Oral examination

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

Written examination, Oral examination

#### **Examination methods in case of permanent assessment**

Report

#### **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%