Photovoltaic Energy Conversion (E900132)

Course Specifications
Valid as from the academic year 2018-2019

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.

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

- Bridging Programme Master of Science in Photonics Engineering  credits  4  offering  A
- European Master of Science in Photonics  credits  4  offering  A
- Master of Science in Photonics Engineering  credits  4  offering  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. Ecolgic 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

(Approved)
basics of thermodynamics, quantumphysics, solid-state physics, semi-conductor physics, diode theory

Final competences
1 INSIGHTS: Understanding the basic principles of photovoltaic energy conversion.
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
Excursion, lecture, seminar, seminar: practical PC room classes

Learning materials and price
course notes

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
Written examination, oral examination

Examination methods in case of periodic evaluation during the second examination period
Written examination, 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: 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%