

Initial competences

The students should have taken systems courses on computer architecture, operating systems, and parallel computer systems.

Final competences

- 1 Understand the impact of computing on sustainability.
- 2 Be able to explain sustainable computing systems.
- 3 Be able to measure and model the power and energy efficiency of a computer system.
- 4 Be able to analyze and optimize computer systems for improved sustainability.

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

Extra information on the teaching methods

The course will consist of theory lectures, seminar-type assignments and hands-on experiments through which the students will characterize and analyze the sustainability of modern-day computer systems.

Study material

Type: Syllabus

Name: articles, exams from previous years

Indicative price: Free or paid by faculty

Optional: no

Language : English

Number of Pages : 400

Available on Ufora : Yes

Online Available : Yes

Available in the Library : No

Available through Student Association : No

Type: Slides

Name: theory

Indicative price: Free or paid by faculty

Optional: no

Language : English

Number of Slides : 500

Available on Ufora : Yes

Online Available : Yes

Available in the Library : No

Available through Student Association : No

References

A variety of sources including recently published articles (provided to the students as recommended reading) on various topics pertaining to sustainable computing, including the following synthesis lectures:

- The Datacenter as a Computer: Designing Warehouse-Scale Machines, Third Edition, Morgan & Claypool Publishers, Luiz André Barroso, Urs Hölzle, Parthasarathy Ranganathan, October 2018
- Power-Efficient Computer Architectures: Recent Advances, Morgan & Claypool Publishers, Magnus Själander, Margaret Martonosi, Stefanos Kaxiras, December 2014
- Fault Tolerant Computer Architecture, Morgan & Claypool Publishers, Daniel J. Sorin, 2009

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 assessment

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

Written assessment

Examination methods in case of permanent assessment

Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

End-of-term evaluation and continuous assessment:

- End-of-term evaluation: written exam, open book
- The continuous assessment consists of (i) discussion and critical analysis of recent scientific articles during the coached exercise sessions, and (ii) executing and reporting practical computer exercises.

Calculation of the examination mark

End-of-term evaluation (75%) and continuous assessment (25%)