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TECHNOLOGIECAMPUS OOSTENDE

Implementation of Innovative ICT Based Teaching & Learning Methods
(related to WP3)

Erasmus+ Project "PHYSICS"

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Main goal

- Teaching and preparing students:

  o to think and act as an academically skilled person,

  o to realise an academic and research oriented career,

  o to realise an industry oriented career.

  This main goal requires an appropriate **learning process** embedded in a **learning environment**.

Main goal

- The **Learning Environment** can be modelled as:
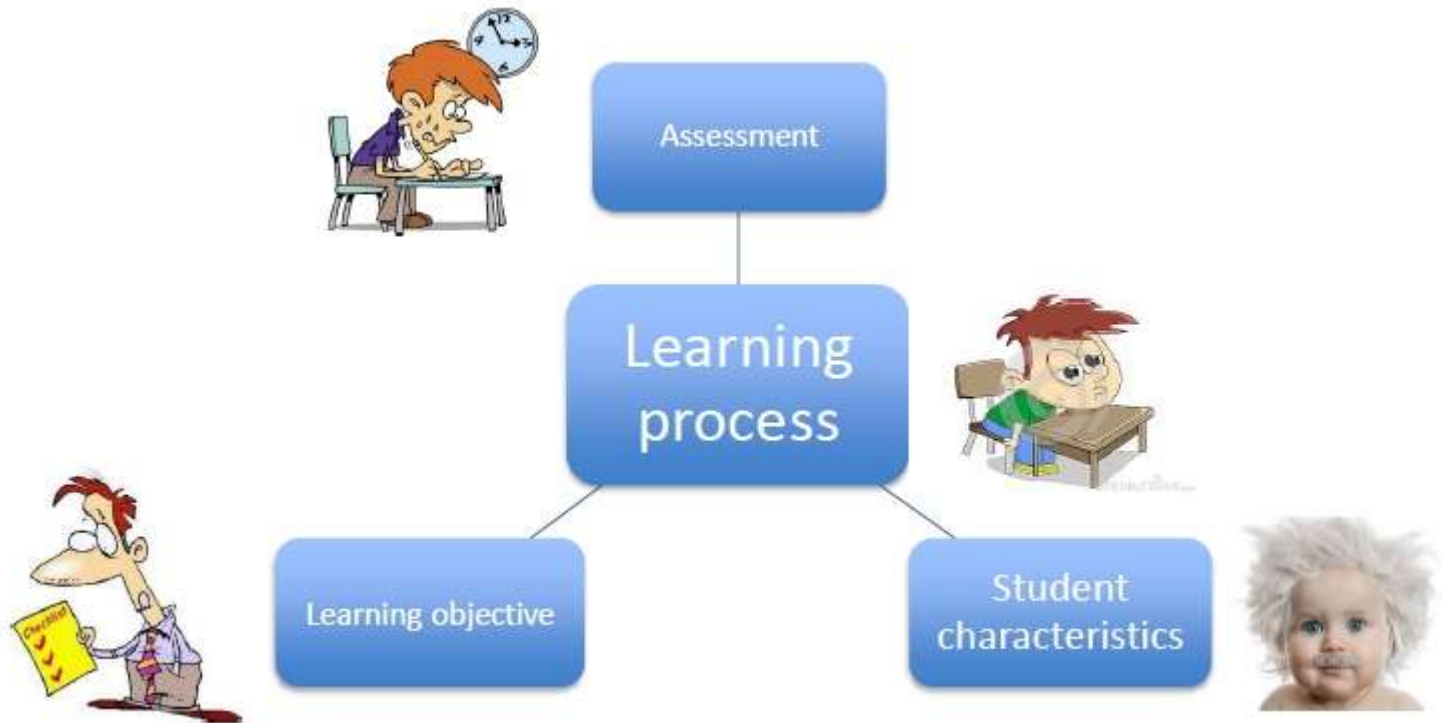
Main goal

- The **learning objectives** for each course need to be formulated:
  - o knowledge, attitudes, skills, …

- The **student characteristics** are important:
  - o prior knowledge, motivation, interests, age, …

- The student needs to be **evaluated (assessment)**:
  - o formative and summative assessment
  - o when, what, how, who, …

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Main goal

- The **learning process** and the content of the course is also very important:

    - ○ **Digital content** is easy to adjust and elaborate
    - ○ **Digital content** is easy to structure
    - ○ **Digital content** provides new possibilties

    A **Virtual Learning Environment** is an important tool.
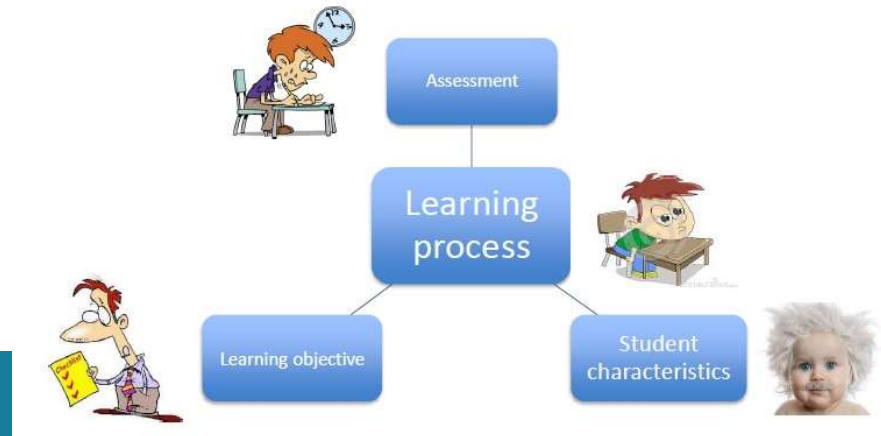
Virtual Learning Environment

- A **Virtual Learning Environment** allows teachers to:

  o provide students with study material of different types (for example e-books)

  o interact with the students in real-time

  o follow the evolution of the learning process

  o know the performance of each student in specific tasks

Virtual Learning Environment

- A Virtual Learning Environment is known to be useful when teaching '**science**' and '**physics**'.

- Objects of many kinds can be used:
    - Text documents
    - Videos and mp3
    - Scanned images
    - Links to websites
    - Animations
    - Simulations
    - …

Virtual Learning Environment

- A Virtual Learning Environment provides **useful tools**:

  - uploading of course material i.e. course content
  - Questionnaires + quizzes
  - (peer)assessment
  - Communication, including chat sessions and forums
  - Wikis and blogs
  - Tracking tools
  - Feedback to the students
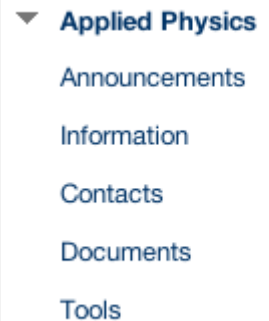 - Administration of student groups

Virtual Learning Environment

- Virtual Learning Environments can be:

  - Commercial software: e.g. **Toledo**, Blackboard
  - Open source software: e.g. **Moodle**

The use of Toledo

- In **a Toledo community**, a draft of the online course "applied physics" has been made.

- See: https://toledo.kuleuven.be/

- The course is organized in separate blocks:
  - o Announcements
  - o Information: general and administrative information
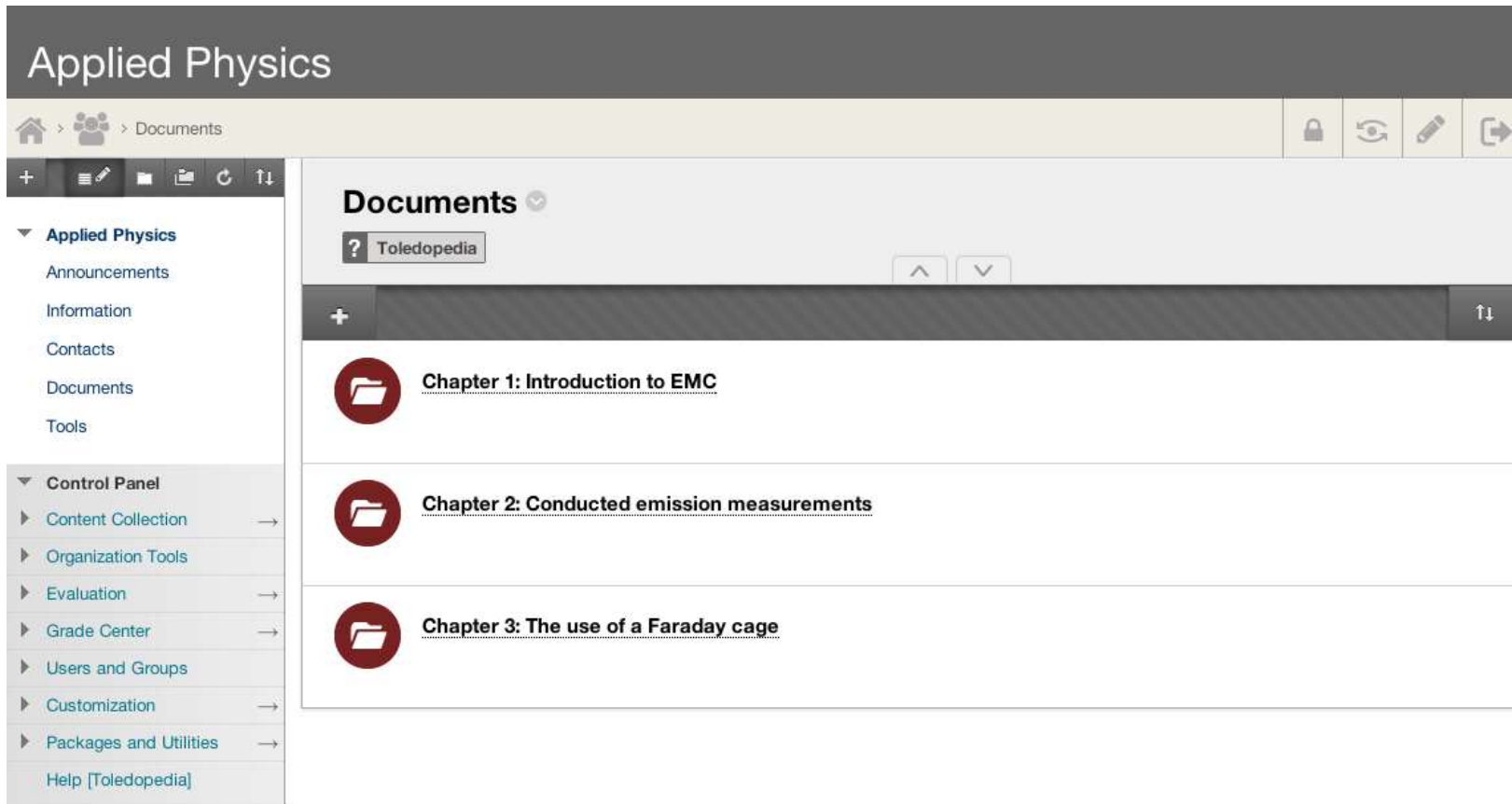 - o Contacts
  - o Documents: contains several chapters
  - o Tools

Applied Physics
Announcements
Information
Contacts
Documents
Tools

The use of Toledo

- A screenshot of the block "documents"

The use of Toledo

- **Each chapter** contains a number of items. For example in 'chapter 1', we have embedded **a number of items**:

  - o Roadmap: the menu to be followed in a chronological order
  - o Learning outcomes
  - o Pre-requisites: to reveal any lack of prior knowledge
  - o Theoretical lecture: e.g. 'introduction to EMC'
  - o Open ended questions
  - o Close ended questions
  - o Learning tasks: to extend the level of the newly acquired knowledge

The use of Toledo

- Screenshot of 'chapter 1'

Items 1-4 are standard and will be included in each chapter.

Items 5-7can vary chapter by chapter.

Roadmap

Enjoy "Applied Physics" and go for a full comprehension of the concepts outlined in chapter 1. Here is the menu to follow in a chronological order:

- take note of the learning outcomes before starting to study
- examine the pre-requisites to reveal any lack of foreknowledge
- read carefully and try to understand the theoretical lecture "Introduction on EMC"
- check your knowledge by answering the open-ended check questions
- evaluate yourself by performing the test with the closed-ended check questions
- carry out the learning tasks to extend the level of your knowledge

Learning outcomes

Pre-requisites

Theoretical lecture "Introduction to EMC"

Attached Files: 📄 Introduction to EMC ⊘ (943.899 KB)

Check questions (open-ended)

Check questions (close-ended)

Availability: Item is not available.

Learning tasks

The use of Moodle

- Instead of Toledo, also the **open source software Moodle** can be used.

  - Courses developed by Toledo or Moodle allow **self-study of the student** (coached by a teacher allowing distance learning).
  - Courses can be combined with classroom lessons, realising **blended learning**.

The use of Moodle

- A Moodle account can be obtained using website https://eduspace.lv/?lang=en (eduspace)

- Using Toledo or Moodle, **all educational tools** mentioned before **can be demonstrated**.
  - Uploading content, using questionnaires, …
  - peer assessment, sending personal messages, communication between teacher and student, …

- Using Toledo or Moodle, the educational **tools** which are useful **can be used** by all of us.

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The use of Moodle
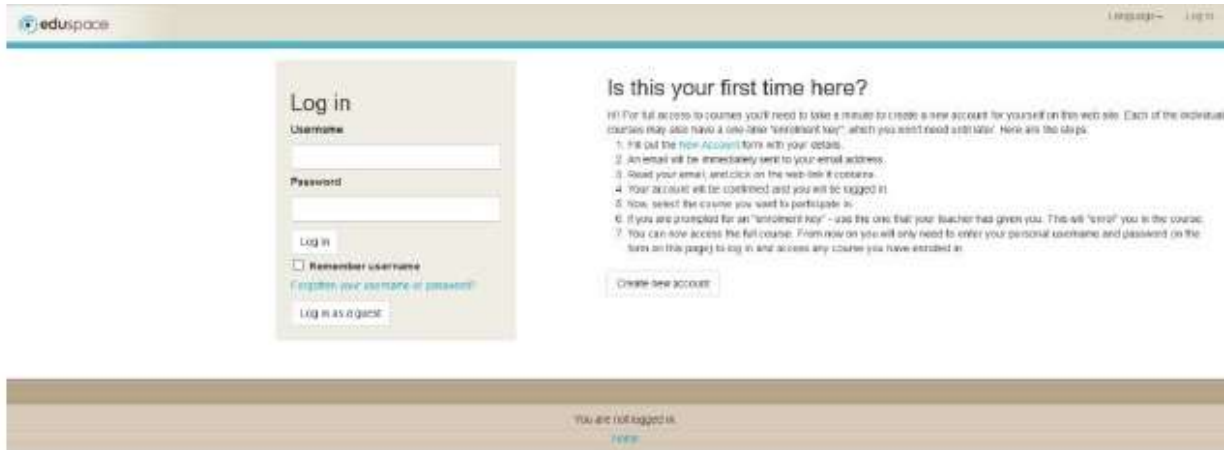
The eduspace login page.

Image 3. Eduspace.lv course category page
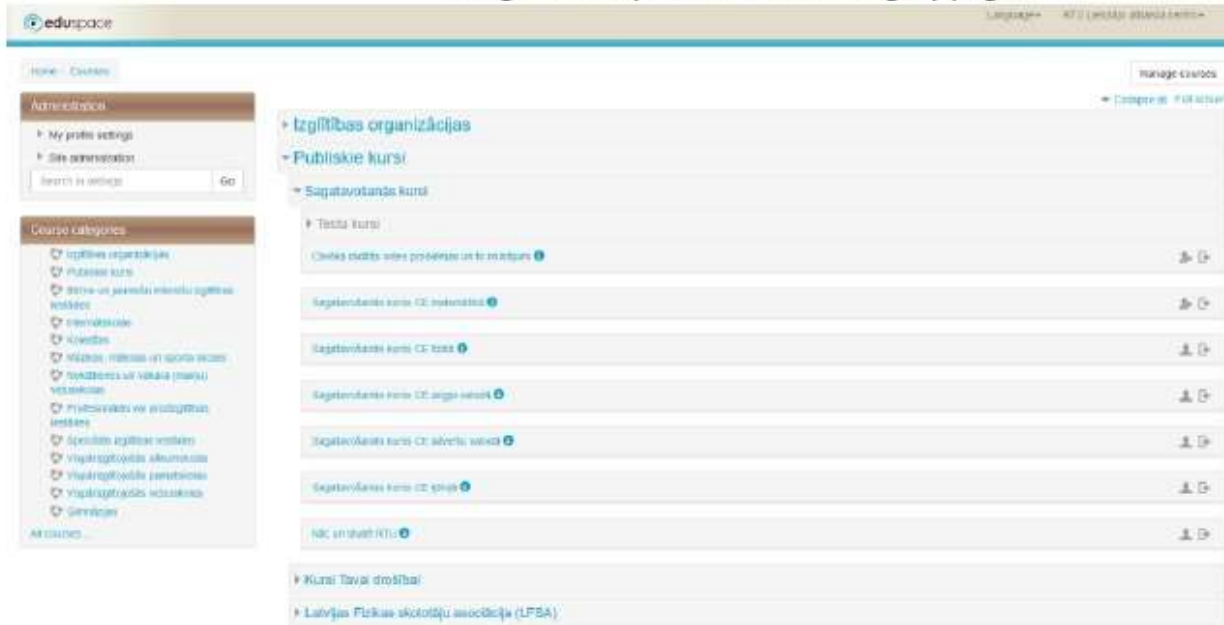
Practical approach

- The Erasmus+ "Physics" team needs **a practical approach** to realise the courses on the Moodle environment.

Suggestion:

- Concerning the **course "Applied physics"**, **a practical example** will be realised 'as fast as possible' (target: summer time or September 2016).

- **Inspired by this example** other courses can be realised using Moodle.

Practical approach

- When **realising other courses using Moodle**, the KU Leuven team will **try to help** you. The "workshop on ICT environment tools" in Belgium (April 2017) is important.

- Suggested principle:

  o Virtual Learning Environments like Moodle provide tools. You use the tools you need i.e. which are useful.

Practical suggestions?

Let's discuss the possibilities.

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References

- Martin-Blas T., Serrano-Fernandez A. (2009), <u>The role of new technologies in the learning process: Moodle as a teaching tool in physics</u>, Computers & Education, vol. 52, pp. 35-44.

- Dewulf L., Janssens A., (2010), <u>Actief in de digitale leeromgeving, Mechelen</u>, Uitgeverij Plantyn, ISBN 978-90-301-0386-8

- A lot of other papers discuss the possibilities provided by a learning platform like Moodle

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