# Syllabus

## Course description

<table>
<thead>
<tr>
<th>Course title</th>
<th>Special Issues of Building Physics</th>
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<tbody>
<tr>
<td>Course code</td>
<td>45521</td>
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<tr>
<td>Scientific sector</td>
<td>ING-IND/11</td>
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<tr>
<td>Degree</td>
<td>Master Energy Engineering</td>
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<tr>
<td>Semester</td>
<td>2nd</td>
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<tr>
<td>Year</td>
<td>2nd</td>
</tr>
<tr>
<td>Academic year</td>
<td>2016/2017</td>
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<tr>
<td>Credits</td>
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</tr>
<tr>
<td>Modular</td>
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</tr>
<tr>
<td>Total lecturing hours</td>
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<tr>
<td>Total lab hours</td>
<td></td>
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<tr>
<td>Total exercise hours</td>
<td>20</td>
</tr>
<tr>
<td>Attendance</td>
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<td>Prerequisites</td>
<td>Students regularly enrolled at the 1st or 2nd year of the Master Study Programme in Energy Engineering are allowed to follow this course. Exceptional cases must be discussed with the Professor.</td>
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## Specific educational objectives

The course focuses on the design of illumination systems in buildings (electric and natural lighting), with the aim of improving energy-efficiency and visual comfort.

### Lecturer

eng. Anna Maria Atzeri PhD

### Scientific sector of the lecturer

English

### Office hours

Wednesday 10:30-12:30

### Teaching assistant (if any)

eng. Simone Torresin, eng. Luca Zaniboni

### Office hours

Wednesday 10:30-12:30

### List of topics covered

- **Light and vision:**
  - Human perception of electromagnetic waves. Eye and light.
  - Lighting quantities.

- **Solar radiation:**
  - Radiation and light, solar radiation and daylight. Radiation components (direct and diffuse) and distribution.
  - Lighting effectiveness.

- **Daylighting modelling:**
  - From external to internal daylight illuminance.
  - Daylighting modelling approaches and practical
### Examples
Daylighting and artificial lighting control and systems:
- Envelope components for passive and active daylight and solar control. Artificial lighting systems. Control strategies and energy performance.
- Standard in force about lighting and daylighting

### Teaching format
Class lectures (blackboard and/or slides) and design exercises using spreadsheets and lighting, daylighting and/or energy simulation software. Some of the lecture material (slides) will be available for download by the students.

### Learning outcomes
At the end of the course the students will be able to:
- i. formulate their own definition of what constitutes "good" lighting
- ii. design the light in confined spaces considering electric and natural lighting as a whole
- iii. optimize electric and natural light use in building together with comfort conditions

### Assessment
Coursework will be weighted as follows: final oral examination (50%), student project work (50%). In order to take the oral examination the project work must be completed.

### Assessment language
English

### Evaluation criteria and criteria for awarding marks

### Required readings

### Supplementary readings