Syllabus – Elective Course

Course title:

**Renewable Energies: A Focus on Solar Energy**

Credits:

**6 ECTS credits**

Teaching language:

**English**

Target students:

**Undergraduate students in Science, Energy, Renewable Energy, Chemistry, and Engineering (mechanical, civil, electrical ...)**

Teacher in charge of the course:

**Prof Léo Lecoeuche**

COURSE PRESENTATION

Prerequisite:

Students taking this course should have completed the second year of a Bachelor of Science or Bachelor in Business Administration program. They must have some ability to work as a group and be able to communicate easily in English at a standard university level. In other respects, the course is intended to serve a mix of profiles and learning backgrounds for a more diverse international learning experience.

Content:

**Solar Energy:**
- Solar Thermal Power utilization

**Photovoltaic energy:**
- Introduction to the different technologies and uses of solar panels.
- Building of a small solar vehicle
  - Technical Project Session 1: 3D Printing and Solidworks
  - Technical Project Session 2: Turning and Milling
  - Technical Project Session 3: Introduction to Solar Energy
  - Technical Project Session 4: construction of solar vehicles
  - Technical Project Session 5: construction of solar vehicles
  - Company visit
  - Project presentation and wrap-up

**Hydroelectric Energy:**
- Momentum analysis of fluid flow: practical introduction to hydroelectricity in the fluid side
Pelton turbine

Case studies for sustainable energy system in households and large scale buildings (fluid flow, energy calculation).

Learning Outcomes:

By the end of the course, the students should be able to:

- name the different types of renewable energies
- explain the advantages of the various renewable energies and their range of implementation in various countries
- calculate the yield of solar energy on vehicles and in housing,
- design a model/small object to illustrate the use of solar energy,
- develop their intercultural skills to work in an international setting by studying on a European campus with French and international teachers and classmates

WORKLOAD

French contact hours = 60 minutes (in some countries/institutions, 1 contact hour = 45-50 minutes)

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<thead>
<tr>
<th>Form:</th>
<th>Number of hours</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face, In-class, fieldtrip</td>
<td>39 hours</td>
<td>13 sessions of 3 hours</td>
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<tr>
<td>Approximate personal work/Homework</td>
<td>15 hours</td>
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<tr>
<td>Student total workload</td>
<td>54 hours</td>
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EDUCATIONAL METHODS

Lectures, case studies, project, company visits

RESOURCES

All course materials will be supplied in class. Reference may be made to the following resources:


ASSESSMENT

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<tr>
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<th>Duration</th>
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<tr>
<td>Continuous assessment (20%)</td>
<td>2</td>
<td>20 minutes</td>
<td>Exercises</td>
</tr>
<tr>
<td>Final exam (60%)</td>
<td>1</td>
<td>20 minutes</td>
<td>Project presentation</td>
</tr>
<tr>
<td>Others (student participation...) (20%)</td>
<td>Participation and contribution to group discussion</td>
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This syllabus is based on information available at the time of publication (October 2020). Changes may occur.

For updated information about course content, please contact us: lilleprograms@univ-catholille.fr