Course guides
330218 - TCO1 - Complementary Technologies I

Unit in charge: Manresa School of Engineering
Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT Engineering.
Degree: BACHELOR'S DEGREE IN ICT SYSTEMS ENGINEERING (Syllabus 2010). (Compulsory subject).
Academic year: 2021 ECTS Credits: 6.0 Languages: Catalan

LECTURER
Coordinating lecturer: M. ROSA GIRALT MAS
Others: Busquets Rubio, Pere Martínez Domene, Juan Vila Marta, Sebastian

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Connections of basic aspects of complementary technologies in the ICT environment with the objective of acquiring a broad perspective of the technology applied to engineering.

Transversal:
2. ENTREPRENEURSHIP AND INNOVATION - Level 1. Showing enterprise, acquiring basic knowledge about organizations and becoming familiar with the tools and techniques for generating ideas and managing organizations that make it possible to solve known problems and create opportunities.
3. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 1. Analyzing the world's situation critically and systemically, while taking an interdisciplinary approach to sustainability and adhering to the principles of sustainable human development. Recognizing the social and environmental implications of a particular professional activity.
4. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
5. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
6. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

TEACHING METHODOLOGY
The subject is a succession of five workshops, two informative sessions and a series of conferences and / or visits to companies, of particular interest for the ICT Systems profile and also for general topics, which can be done optionally. The workshops are activities focused on a very specific objective and are rather instrumental in nature.
The subject is taught in 4 hours per week dedicated mainly to workshops and involves a significant personal workload. The workshops are taught sequentially in time and are self-contained activities. The lectures and optional visits are held during school hours, but outside the hours established for this subject.
LEARNING OBJECTIVES OF THE SUBJECT

After passing this subject the student must:
1. Have a good knowledge at the user level and moderate work agility in the use of the UNIX shell.
2. Acquire dexterity in the use of the usual laboratory instrumentation.
3. Observe and analyze the complex reality of the world from a sustainability perspective.
4. Know how to apply the concept of sustainability to the activities of ICT engineering.
5. Know how to write and structure a document correctly using Latex.
6. Demonstrate skill in planning an oral communication, both in the selection of the information to be communicated and in the means used.
7. Solvent use of information resources.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>48,0</td>
<td>32.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>12,0</td>
<td>8.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

**Workshop 1: Laboratory instrumentation**

**Description:**
In this topic we will work on various aspects of the laboratory instruments used in the practices of the different subjects of the degree, such as the oscilloscope, the function generator and the power supply.

Taught by: Joan Martinez

**Related activities:**
Workshop and directed works.

**Full-or-part-time:** 20h
- Theory classes: 2h
- Laboratory classes: 6h
- Self study : 12h

**Workshop 2: Unix**

**Description:**
In this workshop, the skills, knowledge and skills necessary to work fluently with the UNIX operating system through the shell will be acquired. Orders, standard input / output, pipes, redirects, filesystem, devices, permissions, scripting.

Taught by: Sebastià Vila

**Related activities:**
Workshop and directed works

**Full-or-part-time:** 45h
- Theory classes: 12h
- Laboratory classes: 6h
- Self study : 27h
**Workshop 3: ICT and sustainability**

**Description:**
In this topic we will work:
- The world economic, political, social and environmental situation.
- Sustainability paradigm. Sustainable development concept.
- Globalization: The role of ICT in globalization.
- Environmental economics and world governance.
- ICT and sustainable development.

**Taught by:** Pere Busquets

**Related activities:**
Workshop and directed works

**Full-or-part-time:** 40h
- Theory classes: 16h
- Self study: 24h

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**Workshop 4: Oral communication**

**Description:**
In the activities of engineers, communication, both oral and written, becomes a very important element. This workshop aims to provide tools and resources to improve oral communication. Techniques and resources will be presented to facilitate the presentation of the content to be transmitted, so that it adapts to the profile of the listeners. Guidelines will also be given on the use of supports that complement the oral presentation. As a complement, the search for information will also be worked on.

**Taught by:** Rosa Giralt

**Related activities:**
Directed work

**Full-or-part-time:** 25h
- Theory classes: 10h
- Self study: 15h

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**Workshop 5: Latex**

**Description:**
There are different tools for writing documents. In this workshop there will be an introduction to Latex, a tool widely used during the degree for all types of documents. You will acquire the basic knowledge and skills to use the LaTeX editing system. Types of documents, form, structure of a document, common marks, document processing, Emacs support to work with LaTeX, work with bibliography, tables, figures. I work with LaTeX and subversion.

**Taught by:** Sebastià Vila

**Related activities:**
Workshop and directed work.

**Full-or-part-time:** 20h
- Theory classes: 8h
- Self study: 12h
**ACTIVITIES**

### Workshop

**Description:**
Are activities that mix generally short theoretical expositions with tutored exercises, discussions, with the aim that students progress in a particular topic.

**Related competencies:**
- Connections of basic aspects of complementary technologies in the ICT environment with the objective of acquiring a broad perspective of the technology applied to engineering.
- Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
- Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.
- Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
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**Full-or-part-time:** 120h
- Theory classes: 48h
- Laboratory classes: 12h
- Self study: 60h

### Directed works

**Description:**
The student's objective is to solve small exercises, answer questionnaires or write reports that complement the contents and collaborate with the greater understanding of systems.

**Related competencies:**
- Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.
- Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
- Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
- Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
- Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.
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**Full-or-part-time:** 30h
- Self study: 30h
**GRADING SYSTEM**

The final grade for the course is obtained from the grades of the different workshops. Optional activities may earn extra points in the final grade. If $T_x$ is the grade of the workshop $x$, and $C$ the extra points of the optional activities, then the final grade is computed as:

$$N = \min (10, (0.20 \, T_i + 0.25 \, T_u + 0.15 \, T_{co} + 0.15 \, T_l + 0.25 \, T_s) + C)$$

**Notes:**
- There will be no final exam, the evaluation will be continuous and will be based exclusively on the grades obtained for each workshop.
- Some works will require a public presentation of the contents.
- Any activity not carried out will be evaluated with 0.

**EXAMINATION RULES.**

The activities will be carried out following the uses and customs of academic work. Particularly:
1. Plagiarism and other ethically reprehensible behavior are considered singularly serious.
2. The dates, formats and other delivery conditions that are set are mandatory.

**BIBLIOGRAPHY**

**Basic:**
- Apunts propis.

**RESOURCES**

**Other resources:**
- Sustainability Portal: http://portalsostenibilidad.upc.edu/
- UNESCO Chair in Sustainability: http://tecnologiasostenibilidad.cus.upc.edu/