Degree competences to which the subject contributes

Transversal:
1. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

Teaching methodology
- Active based. Theory is presented indirectly, through examples, when possible, using activity axis concept to integrate knowledge & application.
- Using basic materials (PWP transparencies), that may be accessed via INTRANET & extranet links.
- Each week, there will be a practice (sub-activity axis) that later the student should apply to other example, completing a dossier.
- As a complement, directed activities should be completed, as projects in a higher level.
- Lastly, a final test & Congress session will complete evaluation.

Learning objectives of the subject
Introduction module, at first semester, don't allow students to get real competencies in professional programming. As a consequence, this advanced module claims to:
- Complete initial vision, with additional capabilities needed by an engineer working in a multidisciplinary environment, including informatic experts.
- Be able to develop with modular design, use dynamic structures & managing exceptions.
- View full cycle from specification & design, viewing life cycle as a component of method, & understanding the need for documentation.
820249 - POOVEIA - Object-Oriented and Visual Programming

<table>
<thead>
<tr>
<th>Study load</th>
<th>Hours small group:</th>
<th>60h</th>
<th>40.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total learning time:</td>
<td>150h</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self study:</td>
<td>90h</td>
<td></td>
<td>60.00%</td>
</tr>
</tbody>
</table>
## Content

<table>
<thead>
<tr>
<th>(ENG) M1. Specification, design &amp; programming with modular criteria</th>
<th>Learning time: 24h</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Laboratory classes: 12h</td>
</tr>
<tr>
<td>W1. Introduction &amp; MP concept.</td>
<td>Self study: 12h</td>
</tr>
<tr>
<td>W2. Information Hiding (IH) concept. MP applications with IH.</td>
<td></td>
</tr>
<tr>
<td>W3. Recursivity.</td>
<td></td>
</tr>
</tbody>
</table>

**Related activities:**
- Concepts presentation.
- Exercises resolution
- LAB practices
- DOSSIER & Np1-t Hmwk

**Specific objectives:**
Consolidate knowledge & capacities of programming, applying MP criteria using IH.

<table>
<thead>
<tr>
<th>(ENG) M2. The concept of CLASS (IH, as a TAD, Abstract Data TYPE)</th>
<th>Learning time: 20h</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Laboratory classes: 8h</td>
</tr>
<tr>
<td>W5. An OO application.</td>
<td></td>
</tr>
</tbody>
</table>

**Related activities:**
- Concepts presentation.
- Exercises resolution
- LAB practices
- DOSSIER & NP2-LAB

**Specific objectives:**
Specifying, designing & developing a class.
### M3. Dynamic structures

**Description:**
W7. An OO application including dynamic structures.

**Related activities:**
- Concepts presentation.
- Exercises resolution
- LAB practices
- DOSSIER & Np3-t

**Specific objectives:**
Designing using dynamic structures.

<table>
<thead>
<tr>
<th>Learning time: 20h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory classes: 8h</td>
</tr>
<tr>
<td>Self study: 12h</td>
</tr>
</tbody>
</table>

### (ENG) M4. Introduction to Visual Programming (VP)

**Description:**
W9. More about VP. Developing an application using VP.

**Related activities:**
- Concepts presentation.
- Exercises resolution
- LAB practices
- DOSSIER & Np4-LAB

**Specific objectives:**
Develop a simple application using VP.

<table>
<thead>
<tr>
<th>Learning time: 20h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory classes: 8h</td>
</tr>
<tr>
<td>Self study: 12h</td>
</tr>
</tbody>
</table>
(ENG) M5. Classification, inheritance and polymorphism

Description:

Related activities:
- Concepts presentation.
- Exercises resolution
- LAB practices
- DOSSIER & NP5-t

Specific objectives:
Develop a small application using classification & polymorphism.

Learning time:
Laboratory classes: 8h
Self study: 12h

(ENG) M6. Other topics

Description:
W12. Exception management.
W13. Files.
W15. Congress.

Related activities:
- Concepts presentation.
- Exercises resolution
- LAB practices
- DOSSIER & NP6 LAB
- Congress

Specific objectives:
Advance as much as possible with additional topics.

Learning time:
Laboratory classes: 16h
Self study: 30h

Qualification system

LAB & dossier = 30%
NP = 30%
Congress = 10%
Final exam = 30%
Bibliography

Basic:
