# 340375 - ESC2-I3O01 - Computer Structure II

**Coordinating unit:** 340 - EPSEVG - Vilanova i la Geltrú School of Engineering  
**Teaching unit:** 701 - AC - Department of Computer Architecture  
**Academic year:** 2017  
**Degree:** BACHELOR’S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)  
**ECTS credits:** 6  
**Teaching languages:** Catalan, Spanish

## Teaching staff

**Coordinator:** Eva Marín Tordera

## Degree competences to which the subject contributes

**Specific:**
1. CEFC1. Ability to design, develop, select and value applications and informatic systems affirming its reliability, security and quality corresponding to ethical principals and legislation and current rules.  
2. CEFC13. Knowledge and application of necessary tools for storage, processing and access to informatic systems, including the ones based on webs.  
3. CEFC4. Ability to work out technical conditions of an informatic installation observing standard and current rules.  
4. CEFC7. Knowledge, design and efficient use of data types and structures the most appropriate to resolve problems.  
5. CEFC9. Ability to know, understand and assess computer structure and architecture, as well as basic components forming them.

**Transversal:**
6. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.  
7. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.

## Learning objectives of the subject

Deeper knowledge of the structure of computers, as well as in the design and implementation of small micro-computer based systems. Specifically, it aims to understand and delve into the internal structures and the memory hierarchy (disk, main memory, caches, mechanisms for error detection and correction) in the concepts of concurrency, input / output and buses (survey, interruptions, DMA, types of I / S), and firmware programming of a microcomputer will also be addressed.
### Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 45h</th>
<th>30.00%</th>
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<tbody>
<tr>
<td>Hours medium group:</td>
<td>0h</td>
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<tr>
<td>Hours small group:</td>
<td>15h</td>
<td>10.00%</td>
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<tr>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
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### 1. Input/Output

**Description:**
- 1.1. Devices E/S: Polling
- 1.2. Synchronizing E/S for Interruptions
- 1.2.8 Exceptions
- 1.3. Direct Memory Access (DMA)

**Related activities:**
- Activity 1: Problems Input / Output
- Activity 2: Lab 1 of synchronization by polling
- Activity 2: Lab 2 of synchronization by interruptions
- Activity 4: Partial test of knowledge

**Learning time:** 39h
- Theory classes: 4h
- Practical classes: 8h
- Laboratory classes: 4h
- Guided activities: 2h
- Self study: 21h

### 2. Cache Memory

**Description:**
- 2.1. Introduction to Memory Hierarchy
- 2.2. Cache memory
- 2.3. Impact of the Organization of memory cache performance
- 2.4. Performance Measures
- 2.5 Design Considerations and cache controller

**Related activities:**
- Activity 1: Cache memory exercises
- Activity 2: Memory cache lab

**Learning time:** 30h
- Theory classes: 4h
- Practical classes: 7h
- Laboratory classes: 2h
- Guided activities: 2h
- Self study: 15h
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<table>
<thead>
<tr>
<th><strong>(ENG) 3. Memoria Virtual</strong></th>
<th><strong>Learning time:</strong> 20h</th>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Theory classes: 2h</td>
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<td>Practical classes: 4h</td>
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<td></td>
<td>Laboratory classes: 2h</td>
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<td>Guided activities: 2h</td>
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<td>Self study: 10h</td>
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<tr>
<td><strong>Related activities:</strong></td>
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<tr>
<td>Activity 1: Virtual memory</td>
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<tr>
<th><strong>4. Microprogramming</strong></th>
<th><strong>Learning time:</strong> 29h</th>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Theory classes: 3h</td>
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<td>Practical classes: 6h</td>
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<td></td>
<td>Laboratory classes: 2h</td>
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<td>Self study: 18h</td>
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<td><strong>Related activities:</strong></td>
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<tr>
<td>Activity 1: Microprogramming</td>
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<td>Activity 3: Work directed</td>
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<tr>
<td>Activity 4: Test of knowledge</td>
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**Qualification system**

Final Mark = (1st Partial knowledge test)*0.25 + (Exercises)*0.1 + (Lab)*0.2 + (Complementary work)*0.1 + (2nd partial knowledge test)*0.35 >= 5

The 1st and 2nd partial knowledge tests are reevaluable

**Bibliography**

**Basic:**