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| Program | 09TT- Engineering in Telecommunication Technologies and Services |
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| Course number and name | |
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| Number | 95000061 |
| Name | Processor Architecture Arquitectura de Procesadores |
| Semester | Y4-S7 |

| Credits and contact hours | |
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| ECTS Credits | 4.5 |
| Contact hours | 42 |

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| Coordinator's name | Carlos Carreras Vaquer |
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| Specific course information | | |
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| Description of course content | | |
| Structure, organization and parameters of processor-based systems; instruction-level parallelism (pipelining, multiple-issue); data-level parallelism (vector processing, GPUs); thread/process-level parallelism (multiprocessors, data centres); memory hierarchies; secondary storage and I/O interfaces. Three lab sessions: CPU simulation, GPU computing, and programming of a processor cluster. | | |
| List of topics to be covered | | |
| <ol style="list-style-type: none"> 1. Parameters and metrics of processor-based systems 2. The instruction set architecture 3. Pipelined processors and hazards 4. Multiple-issue architectures, data-parallel processing, multiprocessors and data centres 5. Memory systems 6. Storage and I/O interfaces. | | |
| Prerequisites or co-requisites | | |
| It is recommended some previous knowledge of microprocessors (Digital Systems I) and the C programming language (Digital Systems II) | | |
| Course category in the program | | |
| __ R (required) | <u>X</u> E (elective) | __ SE (selective elective) |

| Specific goals for the course |
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| Specific outcomes of instruction |
| RA70: To acquire knowledge about electronic devices, circuits, equipments and systems. RA71: To learn design techniques of electronic circuits. |

RA75: To specify, to implement, to document, and to use electronic equipments and systems.

RA77: To design devices for interfacing, data acquisition and data storage, and terminals for telecommunication services and systems.

Student outcomes addressed by the course

CE-SE1, CE-SE4, CE-SE5, CE-SE7

Bibliography and supplemental materials

- David A. Patterson y John L. Hennessy, Computer Organization and Design – The Hardware/Software Interface, 4ª edición, Morgan Kaufmann, 2009.
- John L. Hennessy y David A. Patterson, Computer Architecture: A Quantitative Approach, 5ª edición, Morgan Kaufmann, 2012.
- Carl Hamacher et al., Computer Organization and Embedded Systems, 6ª edición, McGraw-Hill, 2012.
- John P. Shen y Mikko H. Lipasti, Arquitectura de Computadores – Fundamentos de los Procesadores Superescalares, McGraw-Hill, 2005.
- -Webpage: <http://moodle.upm.es/titulaciones/oficiales>

Teaching methodology

| <input checked="" type="checkbox"/> lectures | <input checked="" type="checkbox"/> problem solving sessions | <input type="checkbox"/> collaborative actions | <input checked="" type="checkbox"/> laboratory sessions |
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| Other: | Problem solving is part of the lectures. Laboratory sessions are collaborative (groups of two students) | | |