Course guide
270024 - LI - Logics in Information Technology

Last modified: 03/09/2025

Unit in charge:	Barcelona School of Informatics
Teaching unit:	723 - CS - Department of Computer Science.
Degree:	BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2025   **ECTS Credits:** 6.0   **Languages:** Catalan

LECTURER

Coordinating lecturer:	JOSE MIGUEL RIVERO ALMEIDA
Others:	Primer quadrimestre:
	ANTONI LOZANO BOIXADORS - 12, 22
	JOSE MIGUEL RIVERO ALMEIDA - 11, 12, 13, 21, 22
	ENRIC RODRIGUEZ CARBONELL - 11

REQUIREMENTS

- Prerequisite EDA
- Corequisite PROP

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CCO1.1. To evaluate the computational complexity of a problem, know the algorithmic strategies which can solve it and recommend, develop and implement the solution which guarantees the best performance according to the established requirements.

CCO2.1. To demonstrate knowledge about the fundamentals, paradigms and the own techniques of intelligent systems, and analyse, design and build computer systems, services and applications which use these techniques in any applicable field.

CCO2.2. Capacity to acquire, obtain, formalize and represent human knowledge in a computable way to solve problems through a computer system in any applicable field, in particular in the fields related to computation, perception and operation in intelligent environments.

CCO3.1. To implement critical code following criteria like execution time, efficiency and security.

CCO3.2. To program taking into account the hardware architecture, using assembly language as well as high-level programming languages.

CT1.1A. To demonstrate knowledge and comprehension about the fundamentals of computer usage and programming, about operating systems, databases and, in general, about computer programs applicable to the engineering.

CT1.2C. To use properly theories, procedures and tools in the professional development of the informatics engineering in all its fields (specification, design, implementation, deployment and products evaluation) demonstrating the comprehension of the adopted compromises in the design decisions.

CT2.3. To design, develop, select and evaluate computer applications, systems and services and, at the same time, ensure its reliability, security and quality in function of ethical principles and the current legislation and normative.

CT4.1. To identify the most adequate algorithmic solutions to solve medium difficulty problems.

CT4.2. To reason about the correction and efficiency of an algorithmic solution.

CT4.3. To demonstrate knowledge and capacity to apply the fundamental principles and the basic techniques of the intelligent systems and its practical application.

CT5.1. To choose, combine and exploit different programming paradigms, at the moment of building software, taking into account criteria like ease of development, efficiency, portability and maintainability.

CT5.2. To know, design and use efficiently the most adequate data types and data structures to solve a problem.

CT5.3. To design, write, test, refine, document and maintain code in an high level programming language to solve programming problems applying algorithmic schemas and using data structures.

CT5.4. To design the programs¿ architecture using techniques of object orientation, modularization and specification and implementation of abstract data types.

Generical:

G3. THIRD LANGUAGE: to know the English language in a correct oral and written level, and accordingly to the needs of the graduates in Informatics Engineering. Capacity to work in a multidisciplinary group and in a multi-language environment and to communicate, orally and in a written way, knowledge, procedures, results and ideas related to the technical informatics engineer profession.

G9. PROPER THINKING HABITS: capacity of critical, logical and mathematical reasoning. Capacity to solve problems in her study area. Abstraction capacity: capacity to create and use models that reflect real situations. Capacity to design and perform simple experiments and analyse and interpret its results. Analysis, synthesis and evaluation capacity.

TEACHING METHODOLOGY

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LEARNING OBJECTIVES OF THE SUBJECT

1....
2....
3....
4....
5....
6....

STUDY LOAD

Type	Hours	Percentage
Guided activities	6,0	4.00
Hours small group	30,0	20.00
Hours large group	30,0	20.00
Self study	84,0	56.00

Total learning time: 150 h

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Constraint Programming

Description:

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ACTIVITIES

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Description:

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Specific objectives:

1

Related competencies :

G9. PROPER THINKING HABITS: capacity of critical, logical and mathematical reasoning. Capacity to solve problems in her study area. Abstraction capacity: capacity to create and use models that reflect real situations. Capacity to design and perform simple experiments and analyse and interpret its results. Analysis, synthesis and evaluation capacity.

Full-or-part-time: 3h
Theory classes: 1h
Self study: 2h

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Description:

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Specific objectives:

1, 2

Related competencies :

G9. PROPER THINKING HABITS: capacity of critical, logical and mathematical reasoning. Capacity to solve problems in her study area. Abstraction capacity: capacity to create and use models that reflect real situations. Capacity to design and perform simple experiments and analyse and interpret its results. Analysis, synthesis and evaluation capacity.

Full-or-part-time: 20h
Theory classes: 4h
Laboratory classes: 4h
Self study: 12h

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Description:

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Specific objectives:

1, 2, 3, 4, 5

Related competencies :

G9. PROPER THINKING HABITS: capacity of critical, logical and mathematical reasoning. Capacity to solve problems in her study area. Abstraction capacity: capacity to create and use models that reflect real situations. Capacity to design and perform simple experiments and analyse and interpret its results. Analysis, synthesis and evaluation capacity.

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Full-or-part-time: 26h
Theory classes: 6h
Laboratory classes: 6h
Self study: 14h

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Description:

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Specific objectives:

1, 2, 3, 4, 5

Related competencies :

G9. PROPER THINKING HABITS: capacity of critical, logical and mathematical reasoning. Capacity to solve problems in her study area. Abstraction capacity: capacity to create and use models that reflect real situations. Capacity to design and perform simple experiments and analyse and interpret its results. Analysis, synthesis and evaluation capacity.

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Full-or-part-time: 22h
Theory classes: 6h
Laboratory classes: 4h
Self study: 12h

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Description:

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Specific objectives:

1, 2, 3, 4, 5

Related competencies :

G9. PROPER THINKING HABITS: capacity of critical, logical and mathematical reasoning. Capacity to solve problems in her study area. Abstraction capacity: capacity to create and use models that reflect real situations. Capacity to design and perform simple experiments and analyse and interpret its results. Analysis, synthesis and evaluation capacity.

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Full-or-part-time: 10h
Guided activities: 2h
Self study: 8h

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Description:

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Specific objectives:

1, 2, 3, 4, 5

Related competencies :

G9. PROPER THINKING HABITS: capacity of critical, logical and mathematical reasoning. Capacity to solve problems in her study area. Abstraction capacity: capacity to create and use models that reflect real situations. Capacity to design and perform simple experiments and analyse and interpret its results. Analysis, synthesis and evaluation capacity.

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Full-or-part-time: 20h
Theory classes: 4h
Laboratory classes: 4h
Self study: 12h

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Description:

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Specific objectives:
4, 5, 6

Related competencies :
G9. PROPER THINKING HABITS: capacity of critical, logical and mathematical reasoning. Capacity to solve problems in her study area. Abstraction capacity: capacity to create and use models that reflect real situations. Capacity to design and perform simple experiments and analyse and interpret its results. Analysis, synthesis and evaluation capacity.
G3. THIRD LANGUAGE: to know the English language in a correct oral and written level, and accordingly to the needs of the graduates in Informatics Engineering. Capacity to work in a multidisciplinary group and in a multi-language environment and to communicate, orally and in a written way, knowledge, procedures, results and ideas related to the technical informatics engineer profession.

Full-or-part-time: 19h
Theory classes: 3h
Laboratory classes: 6h
Self study: 10h

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Description:

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Specific objectives:
5, 6

Related competencies :
G9. PROPER THINKING HABITS: capacity of critical, logical and mathematical reasoning. Capacity to solve problems in her study area. Abstraction capacity: capacity to create and use models that reflect real situations. Capacity to design and perform simple experiments and analyse and interpret its results. Analysis, synthesis and evaluation capacity.
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Full-or-part-time: 14h
Theory classes: 2h
Laboratory classes: 6h
Self study: 6h

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Description:
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Specific objectives:
1, 2, 3, 4, 5, 6

Related competencies :
G9. PROPER THINKING HABITS: capacity of critical, logical and mathematical reasoning. Capacity to solve problems in her study area. Abstraction capacity: capacity to create and use models that reflect real situations. Capacity to design and perform simple experiments and analyse and interpret its results. Analysis, synthesis and evaluation capacity.
G3. THIRD LANGUAGE: to know the English language in a correct oral and written level, and accordingly to the needs of the graduates in Informatics Engineering. Capacity to work in a multidisciplinary group and in a multi-language environment and to communicate, orally and in a written way, knowledge, procedures, results and ideas related to the technical informatics engineer profession.

Full-or-part-time: 16h
Guided activities: 2h
Self study: 14h

GRADING SYSTEM

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BIBLIOGRAPHY

Basic:
- Farré, R. [et al.]. Lógica para informáticos. Marcombo, 2011. ISBN 9788426716941.
- Schöning, U. Logic for computer scientists. Boston, MA: Birkhäuser, 2008. ISBN 9780817647636.

Complementary:
- Rossi, F.; van Beek, P.; Walsh, T. Handbook of constraint programming. Amsterdam: Elsevier, 2006. ISBN 0444527264.
- Journal of the ACM (JACM).
- Heule, Marijn; Walsh, Toby; van Maaren, Hans; Biere, Armin. Handbook of satisfiability [on line]. Second edition. Washington: IOS Press, 2021 [Consultation: 07/03/2025]. Available on: https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=28617772. ISBN 9781643681603.

RESOURCES

Hyperlink:
- http://www.cs.upc.edu/~li