Last update: 12-04-2019

340374 - ESIN-I3O23 - Information Structure

Coordinating unit: 340 - EPSEVG - Vilanova i la Geltrú School of Engineering

Teaching unit: 723 - CS - Department of Computer Science

Academic year: 2019

Degree: BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2018). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)

ECTS credits: 6 Teaching languages: Catalan

Teaching staff

Coordinator: Bernardino Casas Fernández, Jordi Esteve Cusiné

Others: Bernardino Casas Fernández, Jordi Esteve Cusiné

Opening hours

Timetable: See the current timetable in the EPSEVG people list:

https://web3.epsevg.upc.edu/coneix-lepsevg/directori-epsevg

Prior skills

Proficiency of imperative object-based programming techniques:
* Classes
* Objects
* Methods
* How to pass parameters
* Recursion

Know well at least one object-oriented imperative language, preferably C++.

Mathematical and algorithmic maturity.

Requirements

Have passed PRO1 or at least being enrolled.

Degree competences to which the subject contributes

Specific:

1. CEFB3. Ability to understand and to have a good command of discrete, logical, algorithmically mathematics and computing complexity and its application to automatical treatment of information by means of computational systems and its application to solve engineering problems.
2. CEFB4. Basic knowledge of use and computer programming, as well as of operating systems, data base and generally informatic programs with engineering applications.
3. CEFB5. Knowledge of informatic systems, its structure, function and interconnection, as well as fundamentals of its programming.
4. CEFC6. Basic knowledge and application of algorithmic processes, informatic techniques to design solutions of problems, analyzing if proposed algorisms are apt and complex.
5. CEFC7. Knowledge, design and efficient use of data types and structures the most appropriate to resolve problems.
6. CEFC8. Ability to analyze, to design, to construct and to maintain applications in a well built, secure and efficient

340374 - ESIN-I3O23 - Information Structure

way choosing the most adequated paradigms and languages.

Transversal:

7. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

8. 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.

Teaching methodology

The methodological approach consists in:
- Presentation in classroom, in participatory classes, of concepts and procedures associated with the subjects.
- Individually or in team exercises inside and outside the classroom.
- Completion of individually practices (activities) or in a team practices (project) inside and outside the classroom.
- Individual study, tests and exams.

Learning objectives of the subject

See Catalan version.

Study load

Total learning time: 150h	Hours large group:	30h	20.00%
	Hours medium group:	0h	0.00%
	Hours small group:	30h	20.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

Last update: 12-04-2019

340374 - ESIN-I3O23 - Information Structure

Content

1. Object oriented programming

Learning time: 5h
Self study : 5h

Description:
See Catalan version.

2. Analysis of the efficiency of algorithms

Learning time: 9h
Theory classes: 4h
Self study : 5h

Description:
See Catalan version.

Related activities:
See Catalan version.

3. Static linear structures

Learning time: 9h
Self study : 9h

Description:
See Catalan version.

4. Dynamic linear structures

Learning time: 26h
Theory classes: 6h
Laboratory classes: 6h
Self study : 14h

Description:
See Catalan version.

Related activities:
See Catalan version.

Last update: 12-04-2019

340374 - ESIN-I3O23 - Information Structure

5. Trees	Learning time: 21h Theory classes: 6h Laboratory classes: 4h Self study : 11h

Description:
See Catalan version.

Related activities:
See Catalan version.

6. Dictionaries	Learning time: 31h Theory classes: 12h Laboratory classes: 4h Self study : 15h

Description:
See catalan version.

Related activities:
See catalan version.

7. Priority queues	Learning time: 10h Theory classes: 4h Laboratory classes: 1h Self study : 5h

Description:
See Catalan version.

Related activities:
See Catalan version.

8. Graphs	Learning time: 8h Theory classes: 6h Laboratory classes: 2h

Description:
See Catalan version.

Related activities:
See Catalan version.

Last update: 12-04-2019

340374 - ESIN-I3O23 - Information Structure

Planning of activities

Activity 1	Hours: 3h 30m Guided activities: 0h 30m Laboratory classes: 3h

Description:
See Catalan version

Support materials:
See Catalan version.

Descriptions of the assignments due and their relation to the assessment:
See Catalan version.

Activity 2	Hours: 3h 30m Guided activities: 0h 30m Laboratory classes: 3h

Description:
See Catalan version

Support materials:
See Catalan version.

Descriptions of the assignments due and their relation to the assessment:
See Catalan version

Activity 3	Hours: 3h 30m Guided activities: 0h 30m Laboratory classes: 3h

Description:
See catalan version.

Support materials:
See catalan version.

Descriptions of the assignments due and their relation to the assessment:
See catalan version.

Control 1	Hours: 2h Theory classes: 2h

Description:
See Catalan version.

Descriptions of the assignments due and their relation to the assessment:
See Catalan version.

340374 - ESIN-I3O23 - Information Structure

Control 2	Hours: 3h Theory classes: 3h

Description:
See Catalan version.

Descriptions of the assignments due and their relation to the assessment:
See Catalan version.

Project	Hours: 27h Laboratory classes: 7h Self study: 20h

Description:
See catalan version.

Support materials:
See catalan version.

Descriptions of the assignments due and their relation to the assessment:
See catalan version.

Qualification system

C1 = Control 1 (partial). Individual written test (2 hours).
C2 = Control 2 (final). Individual written test (3 hours) which integrates knowledge and skills of the entire course.
Act = Result of the activities performed.
Pro = Result of the project.

Theory Qualification: QT = maximum value (0.40*C1+0.60*C2, C2)

Final Qualification: QF = 0.5*QT + 0.2*Act + 0.3*Pro

Project (Pro): It is evaluated from: the execution of the program, the delivered code, and a Validation Test (PV). The Validation Test can be done through a face-to-face interview, or in the Final Control of the subject.

The realization and presentation of the project will be a necessary condition for passing the subject. Otherwise, the final grade for the entire subject will be "Not Presented".

You can reevaluate Control 2 (final).

Regulations for carrying out activities

Written tests (Control 1 and 2) and Activities are on-site and individual.

The project is carried out in teams of two people. It is delivered in a non-contact manner and is evaluated both face-to-face (Validation Trial) and non-contact from the documentation submitted.

Last update: 12-04-2019

340374 - ESIN-I3O23 - Information Structure

Bibliography

Basic:

Bernardino Casas, Jordi Esteve. Apunts d'ESIN. Transparències pels alumnes. Campus virtual,

Bernardino Casas, Jordi Esteve. Col·lecció de problemes d'ESIN. Campus virtual,

Bernardino Casas, Jordi Esteve. Manual de laboratori d'ESIN. Campus virtual,

Hernández Orallo, Enrique; Hernández Orallo, José; Juan Lizandra, Mª Carmen. C++ estándar : [programación con el estándar ISO y la biblioteca de plantilla (STL)]. Madrid: Paraninfo, 2002. ISBN 8497320409.

Guardati Buemo, Silvia. Estructura de datos orientada a objetos : algoritmos con C++. Naucalpan de Juárez (México): Pearson, 2007. ISBN 9702607922.

Martí Oliet, Narciso; Ortega Mallén, Yolanda; Verdejo López, José Alberto. Estructuras de datos y métodos algorítmicos. Ejercicios resueltos.. Madrid [etc.]: Pearson Educación, 2001. ISBN 8420538493.

Complementary:

Stroustrup, Bjarne. El lenguaje de programación C++. Madrid [etc.]: Addison Wesley, 2002 (reimpressió 2007). ISBN 847829046X.

Joyanes Aguilar, Luis. Programación en C++ : algoritmos, estructuras de datos y objetos. 2a ed. Madrid: McGraw-Hill, 2006. ISBN 844814645X.