DEGREE CURRICULUM

PROGRAMMING

Coordination: GERVÁS ARRUGA, JORGE

Academic year 2020-21

PROGRAMMING 2020-21

Subject's general information

<table>
<tr><td>Subject name</td><td>PROGRAMMING</td></tr>
<tr><td>Code</td><td>102175</td></tr>
<tr><td>Semester</td><td>2nd Q(SEMESTER) CONTINUED EVALUATION</td></tr>
<tr><td>Typology</td><td>
<table>
<tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr>
<tr><td>Bachelor's Degree in Design and Creative Tecnologies</td><td>1</td><td>COMMON</td><td>Attendance-based</td></tr>
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<tr><td>Course number of credits (ECTS)</td><td>6</td></tr>
<tr><td>Type of activity, credits, and groups</td><td>
<table>
<tr><th>Activity type</th><th>PRALAB</th><th>TEORIA</th></tr>
<tr><td>Number of credits</td><td>3</td><td>3</td></tr>
<tr><td>Number of groups</td><td>2</td><td>1</td></tr>
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<tr><td>Coordination</td><td>GERVÁS ARRUGA, JORGE</td></tr>
<tr><td>Department</td><td>COMPUTER SCIENCE AND INDUSTRIAL ENGINEERING</td></tr>
<tr><td>Teaching load distribution between lectures and independent student work</td><td>During the course master classes will be combined with the practical classes. In the first, the students will acquire the theoretical competences that will be applied later to practical classes. The student will do the autonomous work in non-attendance hours.</td></tr>
<tr><td>Important information on data processing</td><td>Consult this link for more information.</td></tr>
<tr><td>Language</td><td>The classes will be taught in Catalan.</td></tr>
<tr><td>Distribution of credits</td><td>1 credit is equivalent to 25 hours of student work
6 credits are 150 hours</td></tr>
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PROGRAMMING 2020-21

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
GERVÁS ARRUGA, JORGE	jordi.gervas@udl.cat	6	
VIRGILI GOMÀ, JORDI	jordi.virgili@udl.cat	3	

Learning objectives

The learning objectives of this subject are based on the analysis and design of algorithms, and their subsequent implementation in processing / j5.ps.

Specifically, the goals to be achieved are:

- Know the basic concepts of information management and basic programming algorithms structures .
- Know how to manage and understand variables and operators that intervene in an algorithm.
- Go into the algorithmic schemas and data structures.
- Know how to split a problem in order to solve it by parts.
- Analyze the problem from its algorithmic aspect in order to analyze the design of the solution using the necessary algorithmic structures.
- Mastering an ideal programming environment to develop different programs.

Competences

Basic and transversal competences:

- CB1. Ability to understand and master the concepts in your area of study that starts with general secondary education, and that is usually found on a level that, while based on advanced textbooks, also includes some aspects that They imply knowledge of the vanguard of their field of study.
- CT3. Acquire training in the use of new technologies and information and communication technologies.

General competences:

- CG1. Ability to create and develop responses to communication problems for different digital content.
- CG4. Apply the concepts and methods of digital technologies.
- CG10. Make use of tools and digital media in your professional development.

Specific competences:

- CE9. Know the methodologies, programs, techniques, standards and standards, and be able to use the knowledge base acquired with specific elements of web development.

Subject contents

Topic 1. Introduction to algorithms

1.1 Constants, variables and basic types

1.2 Assignment, sequencing, selection and iteration

Topic 2. Programming basics

2.1 Program's structure

2.2. Sequencing. Iteration and search.

Topic 3. Structured data types

3.1 Direct access structures

3.2 Objects

3.3 Graphical data types

Topic 4. Modularity

4.1 Actions and functions

4.2 Libraries

Topic 5. Graphic programming

5.1 Interaction

5.2 Working with images

5.3 Basic transformations

5.4 Animation

Methodology

Each week the student attends 3 hours face-to-face with **Big Groups** and 3 hours face-to-face with **Medium Groups**. Sessions with a **Medium Groups** are taught in the laboratory.

Big Groups: Theory and Problem Classes (3 credits)

> **Theoretical part**: classes supported with transparencies and / or notes.
> **Part of practical application**: practical work of theoretical concepts explained.

Medium Groups: Laboratory classes (3 credits)

> Guided classes and personalized follow-up for practice groups.

Autonomous work (not face-to-face):

> The practice will be completed in non-attendance hours. The **Medium Groups** sessions support the compulsory practices that the student must develop throughout the course autonomously. It is recommended that the student solves the problems of the collection of problems, in order to practice and obtain feedback from the teacher.

Development plan

Week	Description	Attendance activity WG (Whole group)	Attendance activity SG (Split group)	Home work

1th	Presentation Algorithm Introduction	Subject Presentation Introduction: processes, algorithms and programs	Utilització d'un entorn de programació	Exercise resolution
3th	Basic Algorithmic structures	Constants, variables and elemental types	Programming exercises	Exercise resolution
4th	Basic Algorithmic structures	Assignation, sequential composition, alternative composition and iterative composition	Programming exercises	Exercise resolution
5th	Programming concepts	Structure of a program Sequential treatment. Tour and search	Programming exercises	Exercise resolution
6th	Structured data types	Direct access Structures (n-dimensional arrays)	Programming exercises Support to Practice 1	Exercise resolution
8th	Structured data types	Types of graphic data	Programming exercises Support to Practice 1	Exercise resolution
9th		Mid Term Exam	Delivery of practice 1	Exercise resolution
10th	Modularity	Objects	Programming exercises	Exercise resolution
12th	Modularity	Actions and functions	Programming exercises	Exercise resolution
13th	Graphic programming	Graphic primitives of language Interaction Work with images	Programming exercises Support to Practice 2	Exercise resolution
14th	Graphic programming	Basic transformations Animation	Programming exercises Support to Practice 2	Exercise resolution
16-17th	Final exam	Final exam	Delivery of the Practical 2	
19th	Resitting exam	Resitting exam	Resitting of the practical	

Evaluation

Acronym	Activities of Evaluation	Grade%	Minimum note	In group	Compulsory	Recoverable
TE1	1st Exam	10%	NO	NO	SI	NO
EX1	Exercise 1	15%	NO	NO	SI	NO

EX2	Exercise 2	15%	NO	NO	SI	NO
PRA1	Practice 1	20%	4	YES (<=2)	SI	SI
PRA2	Practice 2	30%	4	YES (<=2)	SI	SI
TE2	2nd Exam	10%	NO	NO	SI	NO
All students are expected to sit for and have a grade above 4 in the practices in order to be able to pass the course. However, the final grade must be >=5.						
Nota Final = 0,10*TE1+0,15*EX1+0,15*EX2+0,20*PRA1 + 0,30*PRA2 + 0,10*TE2						

Observations:

- If the mark obtained in the practice PRA2 is> = 4, then the obtained mark can act as a recovery / improvement of the first practice PRA1, whose weight is 15%

Bibliography

- Brassard, G. Bratley, P. Fundamentos de Algoritmia. Prentice Hall. 1997
- Reas, C. Fry, Ben. Processing: A Programming Handbook for Visual Designers, Second Edition. The MIT Press. 2014.
- Reas, C. Fry, Ben. Make: Getting Started with Processing, Second Edition. Maker Media. 2015.
- Martin, Robert C. Clean Code: A Handbook of Agile Software Craftsmanship. Prentice Hall. 2009