Course guides
804226 - PROG1VJ - Programming I

Unit in charge: Image Processing and Multimedia Technology Centre
Teaching unit: 804 - CITM - Image Processing and Multimedia Technology Centre.
Degree: BACHELOR'S DEGREE IN VIDEO GAME DESIGN AND DEVELOPMENT (Syllabus 2014). (Compulsory subject).
Academic year: 2021 ECTS Credits: 6.0 Languages: Catalan, Spanish

LECTURER
Coordinating lecturer: Zúñiga Zárate, Ana Gabriela

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
3. Use programming languages, algorithmic patterns, data structures, visual programming tools, game engines and libraries for the development and prototyping of video games, in any genre and for any platform and mobile device.

General:
1. Interpret the basics of the use and programming of computers, operating systems, databases and in general, computer programs with applications for engineering.
2. Interpret and master the basics of discrete mathematics, logic, algorithmics and computational complexity, and their application to the automatic processing of information using computer systems and their application for solving engineering problems.

Transversal:
4. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
5. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.

TEACHING METHODOLOGY

Lectures are divided in 2h sessions. During lectures, the teacher presents the theoretical concepts and explains them by means of examples that are solved in class. Some time is also dedicated to the resolution of exercises by the students with the assistance of the teacher (solve the doubts that may appear). An extensive use of campus virtual is mandatory, since the material of the course (slides, exercises, exams, etc.) and the communication between the students and the teacher are done through this system.

Tasks of the course: There are three types of tasks that are planned during the course:
- Four practical exercises to evaluate specific topics of the course (PE).
- A midterm exam that is done in the midterms week 7, specified in the academic calendar (ME).
- The final exam (FE).
LEARNING OBJECTIVES OF THE SUBJECT

Specific:
- Ability to understand and master the basic concepts of logic, algorithms and computational complexity, and its application for solving problems of engineering.
- Knowledge of the basics of using and coding software with applications in engineering.
- Using programming languages, patterns and data structures.

Transversal:
- EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
- EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group</td>
<td>16.0</td>
<td>10.67</td>
</tr>
<tr>
<td>Self study</td>
<td>90.0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>24.0</td>
<td>16.00</td>
</tr>
<tr>
<td>Guided activities</td>
<td>20.0</td>
<td>13.33</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

1. Basic concepts

Description:
1.1. Definitions: Algorithm and Program.
1.3. Compile and link.
1.4. Execution.
1.5. C compiler. Features.
1.6. Examples of games programmed in C.
1.7. Introduction to Visual Studio

Related activities:
Combine theoretical and practical activities.

Full-or-part-time: 11h
Theory classes: 4h 30m
Self study: 6h 30m
2. Types, operators and expressions

Description:
2.1. Variable Names
2.2. Data types and sizes
2.3. Constants
2.4. Declarations
2.5. Arithmetic operators
2.6. Relation and logical operators
2.7. Casting types
2.8. Increment and decrement operators
2.9. Assignment operators and expressions

Related activities:
Combine theoretical and practical activities.

Full-or-part-time: 10h
Theory classes: 4h
Self study: 6h

3. Control flow

Description:
3.1 Statements and blocks
3.2 If-else
3.3 Else-if
3.4 Switch
3.5 Loops-while and for
3.6 Loops-do-while
3.7 Break and continue

Related activities:
Combine theoretical and practical activities.

Full-or-part-time: 25h
Theory classes: 10h
Self study: 15h
## Functions and program structure

**Description:**
- 4.1. Basics of Functions
- 4.2. Functions returning non-integers
- 4.3. External variables
- 4.4. Scope rules
- 4.5. Header files
- 4.6. Static variables
- 4.7. Register variables
- 4.8. Block structure
- 4.9. Initialization
- 4.10. The C preprocessor
- 4.11. Standard libraries

**Related activities:**
Combine theoretical and practical activities.

**Full-or-part-time:** 30h
- Theory classes: 12h
- Self study: 18h

## Midterm exam 1

**Description:**
Examen Parcial 1

**Full-or-part-time:** 2h
- Theory classes: 2h

## 5. Arrays

**Description:**
- 5.1 One-dimensional arrays
- 5.2 Multidimensional arrays
- 5.3 Traversals and searches in arrays

**Related activities:**
Combine theoretical and practical activities.

**Full-or-part-time:** 30h
- Theory classes: 12h
- Self study: 18h
6. Structures

**Description:**
6.1. Basic structures
6.2. Structures and functions
6.3. Arrays of structures
6.4 Typedef
6.5 Unions

**Related activities:**
Combine theoretical and practical activities.

**Full-or-part-time:** 25h
Theory classes: 10h
Self study: 15h

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7. Files

**Description:**
7.1. Introduction
7.2. Read files
7.3. Write files

**Related activities:**
Combine theoretical and practical activities.

**Full-or-part-time:** 15h
Theory classes: 6h
Self study: 9h

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**Final exam**

**Description:**
Examen teórico y práctico

**Full-or-part-time:** 2h
Theory classes: 2h

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**ACTIVITIES**

**Material:**
S01_Practica.pdf

**Full-or-part-time:** 6h
Theory classes: 2h
Self study: 4h
name english

Full-or-part-time: 12h
Theory classes: 4h
Practical classes: 8h

name english

Full-or-part-time: 7h
Theory classes: 2h
Practical classes: 5h

name english

Full-or-part-time: 30h
Theory classes: 12h
Practical classes: 18h

GRADING SYSTEM

The mark of the subject (M) is computed as follows:
\[ M = 0.2 \times ME + 0.4 \times PE + 0.3 \times FE + 0.1 \times PLA \]
where ME is the mark of the midterm exam, PE are the 4 practical exercises that will be done throughout the course (note that the mark each one corresponds to the 10% of the final mark of the subject), FE is the mark of the final exam and PLA is Participation and learning attitude.

Students who do not pass the subject through continuous assessment will have the possibility of presenting themselves to the re-assessment test. In this test all the qualifications will be reevaluated, except 10% of attitude and learning, and the resulting final grade of subject can not exceed 5.
EXAMINATION RULES.

Different exercises will be proposed at each class and the students have to solve before the next class individually. The solution must be uploaded to the Virtual Campus before the deadline.

BIBLIOGRAPHY

Basic:

Complementary:

RESOURCES

Hyperlink: