Course guide
804230 - P1VJ - Project I

Last modified: 18/05/2026

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: 2026 **ECTS Credits:** 6.0 **Languages:** Catalan, English

LECTURER

Coordinating lecturer: Alejandro París

Others: Alejandro París
Rodrigo de Pedro

PRIOR SKILLS

Knowledge of programming using C.

TEACHING METHODOLOGY

Project-based learning: students design, develop and present a video game based on an initial challenge.

During each class, the lecturer will first show the students the theory behind the problem that need solving. Together with the students, the lecturer will explore the different solutions that exist in the present that solve and simplify the complexities of real time applications like videogames.

The lecturer will provide source code for the student to study and complete while integrating it in their own source code for future reference and use. Closing each session, the lecturer will provide with ideas for improving the systems challenging student in order to help and orientate the students in the self learning time.

LEARNING OBJECTIVES OF THE SUBJECT

- Recognise the concepts and procedures involved in managing video game creation projects.

- Plan projects of casual video games, 2D video games and / or 3D video games, using project management tools as support.

- To make decisions about complex situations based on critical reflection, considering the ethical implications of actions.

- Collaborate effectively and responsibly as a member or leader of a team, in interdisciplinary contexts or not, considering the available resources.

STUDY LOAD

Type	Hours	Percentage
Guided activities	12,0	8.00
Hours medium group	30,0	20.00
Self study	90,0	60.00
Hours large group	18,0	12.00

Total learning time: 150 h

CONTENTS

1. Development tools

Description:
Distributed work with Git
Services of github.com
Tools for communication and teamwork: Trello and Slack
Development tools: Visual Studio

Full-or-part-time: 20h
Theory classes: 8h
Self study : 12h

2. Introduction to raylib programming

Description:
Game structure with raylib
Sprites and transparencies
Using input devices
Using audio systems

Full-or-part-time: 35h
Theory classes: 14h
Self study : 21h

3. Coding arcade games

Description:
Modular code structure
Rendering and texture management
The input subsystem
The audio subsystem
Sprite animations
Collision management
User Interfaces

Full-or-part-time: 60h
Theory classes: 24h
Self study : 36h

4. Logic and FSM

Description:
Artificial Intelligence
Graph theory
Coding FSM
QA, testing and debugging

Full-or-part-time: 35h
Theory classes: 14h
Self study : 21h

GRADING SYSTEM

Any academic fraud, plagiarism or use or possession of unauthorised means in an assessment activity leads to a mark of zero (0) for the affected test or assignment. Furthermore, in accordance with the University's regulations, if disciplinary proceedings are initiated the subject is recorded as "Pending Assessment" until a decision is reached. These incidents are managed in accordance with the **Action Framework for Academic Integrity in Assessment at the UPC**.

15% - Assignment 1
30% - Assignment 2
35% - Assignment 3
10% - Final Presentation
10% - Attitude and Participation

WARNING: This subject does not feature any content that can be revaluated.

Irregular actions that may lead to a significant variation of the grade of one or more students constitute a fraudulent performance of an evaluation act. This action entails the descriptive grade of failure and a numerical grade of 0 for the ordinary global evaluation of the course, without the right to re-evaluation.

If the lecturers have indications of the use of AI tools not allowed in the evaluation tests, they may summon the students concerned to an oral test or a meeting to verify the authorship.

BIBLIOGRAPHY

Basic:
- Robert Nystrom. Game Programming Patterns. Genever Benning, 2014. ISBN 0990582906.

Complementary:
- Clinton Keith. Agile Game Development: Build, Play, Repeat. Pearson Education Limited, 2020. ISBN 0136527817.

RESOURCES

Hyperlink:
- http://www.uml.org/- http://www.proyectosagiles.org/- https://github.com/raysan5/raylib/wiki. Raylib Wiki
- https://www.raylib.com/examples.html. Raylib examples
- https://www.raylib.com/cheatsheet/cheatsheet.html. Raylib cheatsheet