Digital Object Integration

2026/2027

Code: 104757
Credits: 6

Degree programme	Type	Course
Interactive Communication	OP	4

Contact lecturer

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Group languages

You can consult this information at the end of the document.

Prerequisites

It is recommended to take this course alongside the following subjects:

- Art and Architecture of Maps and Virtual Environments
- Digital Object Creation

Objectives

- Learn to integrate 3D models (environments, props, and characters) into interactive projects such as video games or applications.
- Learn to implement rigging, skinning, animations, and competitive user interfaces.
- Learn to utilize Unity and manage scripts and shaders to achieve a playable demo. Programming code will be provided by the teaching staff.

Learning outcomes

1. Interpret and discuss documents on the main theories on virtual environments.
2. Plan and execute academic projects in the field of virtual environment theory.
3. Present a summary of the studies made, orally and in writing.
4. Show expertise in operating the relevant computer programmes.
5. Use the virtual spaces created as narrative contexts.
6. Design objects that combine aesthetic norms with perfect technical functionality.
7. Identify the specific features of the design, creation, integration and animation of digital objects (2D and 3D) and specific tools from both a conceptual and a practical perspective.
8. Distinguish the salient features in all types of documents within the subject.
9. Cross-check information to establish its veracity, using evaluation criteria.
10. Form part of groups working on virtual-production projects.
11. Submit course assignments on time, showing the individual and/or group planning involved.
12. Propose new methods or well-founded alternative solutions.
13. Propose projects and actions that are in accordance with the principles of ethical responsibility and respect for fundamental rights and obligations, diversity and democratic values.
14. Propose projects and actions that incorporate the gender perspective.
15. Communicate using language that is not sexist or discriminatory.

16. Analyse a situation and identify its points for improvement.
17. Weigh up the risks and opportunities of both one's own and other people's proposals for improvement.

Contents

CONTENTS

- TOPIC 1: Basic Unity and Git
- TOPIC 2: Polygonal Character Modeling
- TOPIC 3: Environment and Level Design
- TOPIC 4: UI and Scene Management
- TOPIC 5: Rigging and Skinning
- TOPIC 6: Interactions
- TOPIC 7: 3D Animation
- TOPIC 8: Animation Implementation
- TOPIC 9: VFX (Visual Effects)

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Practicum	12	0.48	1, 2, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14
Autonomous work practicum	12	0.48	1, 2, 4, 5, 6, 7, 10, 11
Theory Study	15	0.6	4, 7, 8, 9
Work in the Project	37	1.48	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17
Theory Classes	15	0.6	1, 4, 7, 8, 9, 12, 15, 16
Project	21	0.84	2, 3, 4, 5, 6, 8, 10, 11, 12, 13, 14, 16, 17

METHODOLOGY

This course places greater weight on practical work and project development compared to theoretical instruction. The practical and project-based components will be carried out through working sessions tutored by the instructor, project demonstration sessions, submissions of reports and documentation, and autonomous work conducted by the student either individually or in groups.

- THEORY: Lecture-type classes with materials provided beforehand on the Virtual Campus, introducing the theoretical and practical concepts of the course. Despite being theory classes, a significant portion of each session will be dedicated to solving problems posed by the instructor, either individually or in groups. It is recommended to bring a laptop to these sessions.
- PRACTICAL SESSIONS: Practical cases based on different scenarios will be presented to groups of 3 students. An assignment brief will be provided, and students must implement and present a solution using Blender and Unity. These practical cases will require the application of concepts explained in the theory classes.
- PROJECT: Mid-course, students in groups of 3 or 4 will be provided with a project proposal consisting of developing the appropriate environment for an application or video game over a 6-week period. Students may also submit their own project proposals. During class sessions, students will engage in group work tutored by the instructor and will be required to make periodic submissions of documentation. On the final day of class, each group will deliver an oral presentation of their project, having previously submitted a report on the work carried out.

In addition to those specified in section 5, this course aims for students to acquire the following competences:

- Develop autonomous learning strategies.
- Organization and planning skills.
- Problem-solving skills.

SOFTWARE

Blender, Unity 3D, GitHub.

The detailed schedule containing the contents of the various sessions will be presented on the first day of class and will also be available on the course's Virtual Campus. Students will find all educational materials deemed appropriate by the faculty, as well as all necessary information for the proper tracking of the course. In the event of a change in the teaching modality due to force majeure by order of the competent authorities, the teaching staff will inform students of any changes occurring in the course programming and teaching methodologies.

NOTE: The course content will be sensitive to aspects related to gender perspective and the use of inclusive language.

Annotation: within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
Individual Continuous evaluation on theory	0.2	3	0.12	1, 3, 7, 8, 9
Practicum evaluation	0.2	3	0.12	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17
Assistance and participation in project sessions	0.1	21	0.84	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17
Project	0.5	11	0.44	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17

EVALUATION

1. Continuous Evaluation Activities

The evaluation activities graded out of 10 are the following:

- a) Theoretical test (20% of the final grade)
- b) Submission of practical assignments (20% of the final grade)

- c) Final Project (Interactive Environment) (50% of the final grade)
- d) Monitoring and project control submissions (10% of the final grade)

2. Criteria to Calculate the Final Grade

- To calculate the final grade of the course, a minimum grade of 5.0 will be required in the Theoretical test, the Submission of practical assignments, and the Global Grade of the Final Project.
- Activity *d) Monitoring and project control submissions* does not require a minimum grade to be factored into the average.
- In the case of the Project, the minimum grade of 5.0 is required for the overall final grade of the project (weighted sum of 70% group grade and 30% individual grade), and not for each of its micro-indicators or partial submissions separately.
- To pass the course, students must obtain a minimum global final grade of 5.0.

3. Criteria for the Assignment of a "Non-Assessable" (No Avaluable)

According to point 9 of article 266 of the UAB Academic Regulations, when it is considered that the student has not been able to provide sufficient evidence of evaluation, this course must be graded as non-assessable. In this course, a "Non-Assessable" grade will be assigned if the student does not take the theoretical test and, at the same time, does not submit the final project.

4. Reassessment / Recovery Process

- Students will be entitled to reassessment in the course if they have been evaluated on a set of activities accounting for at least two-thirds of the total course grade (article 261.2 of the UAB Academic Regulations).
- The reassessable activities are the Theoretical test and the Submission of practical assignments. Due to its nature as a group development project tutored over 6 weeks, the Final Project (50%) is defined as a non-reassessable activity.
- To participate in the reassessment activities, the teaching staff requires students to have obtained a minimum grade of 3.5 in the corresponding failed activity.
- The maximum grade that can be obtained in the reassessment process of a failed activity will be 8.0.

5. Single Evaluation

This course/module does not provide for a single-evaluation system.

6. Management and Stability of Working Groups

Working groups are considered stable and may not be dissolved or modified after the first three project sessions. If, for justified reasons of force majeure, a modification is required before this deadline, the express authorization of the instructor will be necessary. In this case, the teaching staff will readjust the scope of the project and/or establish an individualized work plan for the affected members, maintaining the same competence criteria and weighting percentages set out in this guide.

BREAKDOWN AND DETAIL OF ACTIVITIES

- a) THEORETICAL TEST: Exam.
- b) SUBMISSION OF PRACTICAL ASSIGNMENTS: Activity including tasks related to the learning process, the delivery of functional models, and the delivery of an animation pack.
- c) PROJECT: The following instruments and activities will be used to evaluate the project, based on a Group Grade (out of 10) awarded by the teaching staff:
- Student Portfolio: Document explaining the development of the work carried out (project approach, minutes of meetings, research info, explanation of the implemented application with a short user manual, and tests performed).
- Presentation: Oral presentation of 10 to 14 slides on the project developed and results obtained.
- Application: Source and executable version of the developed application or interactive demo.
- Minutes and controls: Presentation of the periodic documentation submitted.

Project evaluation indicators:

The final grade of the project is calculated globally and weighted, taking into account the previous activities and the degree of involvement of each group member according to the following formula:

PROJECT GRADE = GROUP GRADE X 0,70 + INDIVIDUAL GRADE X 0,30

Evaluation Calendar:

- Group monitoring and controls: Continuously throughout the course.
- Submission of the portfolio, oral presentation, and application by students: The last week of class.

Use of the Virtual Campus:

The UAB Virtual Campus will be the vehicle of communication for the submission of assignments and course documentation. It will also be used to set up practical and project groups, as well as for urgent communication in the event of any incident or absence from face-to-face classes.

REGULATIONS ON SANCTIONS AND USE OF ARTIFICIAL INTELLIGENCE

Restricted Use of Artificial Intelligence (AI)

For this course, the use of Artificial Intelligence (AI) technologies is permitted exclusively for searching for artistic references, programming elements such as scripts or shaders under their own responsibility, support tasks, such as bibliographic or information searches, text correction, or translations. Students must clearly identify any parts generated with these technologies, specify the tools used, and include a critical reflection on how AI has influenced the process and final outcome of the assignment. Failure to disclose the use of AI in this evaluated activity will be considered a breach of academic integrity and may result in a partial or total penalty to the assignment grade, or more serious sanctions in severe cases.

Mention of Academic Irregularities

In the event that a student commits any irregularity (academic fraud, plagiarism, or improper use of AI, unless such use is expressly authorized in this guide) that could lead to a significant variation in the grade of an evaluation act, this evaluation act will be graded with a 0, regardless of the disciplinary process that may be instructed. If several irregularities occur within the evaluation acts of the same course, the final grade for this course will be 0.

Action in Cases of Suspected Irregularities

Any student suspected of submitting assignments that have been generated by AI, written by others or copied; include unattributed AI-generated content, or fall outside the permitted scope, may be asked to provide the preliminary work or other materials that can demonstrate it is original work and the result of their own authorship. They may also be asked to separately explain or justify their work. Teachers may also use AI detection systems or carry out any verification tasks they deem appropriate. If, after review, the instructor detects irregularities, the assignment may be graded zero, and the student may be subject to further disciplinary action.

Bibliography

BIBLIOGRAPHY

Foundations of Game Art and Design

- Schell, Jesse. (2019). *The Art of Game Design: A Book of Lenses* (3rd ed.). CRC Press.
- *Description:* Reference textbook that uses different "lenses" or perspectives to analyze how visual,

narrative, and mechanical elements integrate to create a unified gameplay experience.
- Solarski, Chris. (2012). *Drawing Basics and Video Game Art: Classic to Cutting-Edge Art Techniques for 2D and 3D Games*. Watson-Guptill.
- *Description:* Analyzes the connections between classical art (composition, line, shape) and modern video game visual design, ideal for artists and programmers.

Lighting and Art Direction (Technical Art)

- Guerline, Jackie. (2024). *Lighting for Animation and Games: Art, Science, and Technical Integration*. Routledge.
- *Description:* Work by author Jackie Guerline focused on both the technical and aesthetic sides of digital lighting. Explains how to integrate lights, shadows, and color within graphics engines to guide player attention and build atmosphere.
- Akenine-Möller, Tomas; Haines, Eric, & Hoffman, Naty. (2018). *Real-Time Rendering* (4th ed.). CRC Press.
- *Description:* The technical bible regarding how graphics algorithms process art (textures, lighting, models) in real-time within game engines.

Aesthetics, Visual Narrative, and Ludology

- Pearce, Celia. (2009). *Communities of Play: Emergent Cultures in Multiplayer Games and Virtual Worlds*. MIT Press.
- *Description:* Written by expert Celia Pearce, this book examines how the design of virtual art environments and spatial architecture directly influences player behavior and visual identity.
- Sylvester, Tynan. (2013). *Designing Games: A Guide to Engineering Experiences*. O'Reilly Media.
- *Description:* Focuses on how aesthetics and visual stimuli integrate with mechanics to trigger specific emotional responses in the player.
- Suárez-Carballo, Fernando. (2014). La importancia del color en la identidad visual de los videojuegos. *Icono 14*, 12(1), 168-196.
- *Description:* Online academic article analyzing the role of color not just as an aesthetic element, but as a functional and narrative tool within the game interface.

Interface Design (UI) and User Experience (UX)

- Hodent, Celia. (2017). *The Gamer's Brain: How Neuroscience and UX Can Impact Video Game Design*. CRC Press.
- *Description:* Explains how the brain processes visual elements and how to intuitively integrate graphical information (HUD, menus) to enhance the player experience.

Software

- Unity, graphics engine for developing interactive and immersive video games and applications.
- Blender, 3D content creator software for making models and animations of them.
- Quixel Mixer, 3D model texturing software standardized in the industry.
- Krita, image editing software with layers.
- GitHub, repository.

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this link. To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	6	Catalan/Spanish	second semester	afternoon

(PAUL) Classroom practices	61	Catalan/Spanish	second semester	afternoon
(PLAB) Practical laboratories	61	Catalan/Spanish	second semester	afternoon