



ACADEMIC PROGRAM

SCRIPTING (III)

B.F.A. IN INTERACTIVE PRODUCT DESIGN

MODALITY: ON CAMPUS

ACADEMIC YEAR: 2023-2024

Name of the course:	Scripting (III)
Degree :	Interactive Product Design
Location:	Centro Universitario de Tecnología y Arte Digital
Modulo:	Art, Science and Technology
Area:	Foundations of development
Year:	3º
Teaching period:	1º
Type:	OB
ECTS credits:	6
Teaching modality:	On campus
Language:	English
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SUBJECT DESCRIPTION

Area description

This area refers to the study and practice of the set of fundamental concepts that allow the foundation of the concepts of video game development from the technological, programming and mathematical aspects.

Subject description

This subject is a continuation of the theoretical contents of "Scripting I", "Scripting II", "Introduction to programming" and is based on the theoretical knowledge of "Fundamentals of Mathematics and Physics".

It is a fundamental subject for knowing and mastering the theoretical and practical bases that underpin the development of scripting in the creation of interactive digital products.

COMPETENCIES AND LEARNING OUTCOMES

Competencies

Basic and general competences

GC17 - Demonstrate the ability to analyse, synthesise and gather information from different sources.

GC18 - Manage information appropriately.

GC1 - Lifelong learning through self-study and lifelong learning.

CB1 - That students have demonstrated possession and understanding of knowledge in an area of study that builds on the foundation of general secondary education, and is usually at a level that, while relying on advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study.

CB2 - Students are able to apply their knowledge to their work or vocation in a professional manner and possess the competences usually demonstrated through the development and defence of arguments and problem solving within their field of study.

CB3 - Students have the ability to gather and interpret relevant data (usually within their field of study) in order to make judgements that include reflection on relevant social, scientific or ethical issues.

CB4 - Students are able to communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.

CB5 - That students have developed those learning skills necessary to undertake further study with a high degree of autonomy.

Specific competences

SC6 - Apply the practical fundamentals of mathematics and physics to the creation of an interactive digital product.

SC7 - Knowing the practical fundamentals of the use and programming of computers and interactive product development tools.

SC8 - Evaluate the ethical, technical and creative implications of technology in the design of interactive products.

Learning outcomes

Use elementary technical knowledge in the creative design process.

Evaluate the possibilities and restrictions imposed by technology in the construction of the videogame.

Apply the elements of kinematics and dynamics to the design.

Know the syntax and basic use of the programming languages intended for the design of video games.

Develop basic programs accompanied by simple test batteries

Manage the most common operating systems and work environments

Develop simple games in scripting languages

CONTENTS

- Theoretical-practical concepts of videogame implementation

- Processes of conceptualization of programming in videogame engines according to the market.
- Basic concepts of programming in simple languages
- Basic scripting for the design of video games and interactive products
- Knowledge of technology in the field of video games and interactive products

SUBJECT SYLLABUS

UNITY SECTION:

Topic 1: Introduction to Unity and Physics

Topic 2: Code Organisation

Topic 3: Player, Weapons and Items

Topic 4: The Enemy

Topic 5: The Game

Topic 6: ScriptableObjects

UNREAL SECTION:

Topic 1: Introduction to Artificial Intelligence in UnrealEngine

BehaviourTrees&Blackboards

Selectors, Sequences and Tasks

Perception and basic stimuli

Decorators (Conditionals for selectors)

Topic 2: Creating a believable Artificial Intelligence

Sequence Cancellation

Secondary Tasks

Behaviour design

Allies / enemies / neutrals

Complex behaviours

Other types of perception and stimuli

Melee combat AI

Ranged combat and cover AI

Topic 3: Multiplayer

Client / Server structure

Variable Replication

RPCs (Remote Procedure Calls)

TRAINING ACTIVITIES AND TEACHING METHODOLOGIES

TRAINING ACTIVITIES

LEARNING ACTIVITIES	Total hours	Hours of presence
<i>Theoretical classes</i>	40,77	40,77
<i>Seminars and workshops</i>	3,08	3,08
<i>Practical classes</i>	11,54	11,54
<i>Tutorials</i>	5,38	5,38
<i>Evaluation Activities</i>	6,92	6,92
<i>Group work and study</i>	20,00	1,00
<i>Autonomous and individual study and work</i>	62,31	0,00
TOTAL	150	69

Teaching methodologies

Expository method/Master lecture

Case studies

Exercise and problem solving

TEMPORAL DEVELOPMENT

Topic 1: Scripting complex behaviours: 1 week

Topic 2: Game implementation techniques in programming languages and scripting environments: 1 week

Topic 3: Game architecture: building systems: 1 week

Topic 4: Advanced use of scripting APIs: 1 week

Topic 5: Script Debugging Techniques: 1 week

Topic 6: Designing and implementing a game using scripting: 1 week

Topic 1: Introduction to Artificial Intelligence in Unreal Engine: 3 weeks

Topic 2: Creating a believable Artificial Intelligence: 4 weeks

Topic 3: Multiplayer: 3 weeks

EVALUATION SYSTEM

ASSESSMENT SYSTEM	MINIMUM SCORE RESPECT TO THE FINAL ASSESSMENT (%)	MAXIMUM SCORE RESPECT TO THE FINAL ASSESSMENT (%)
<i>Assessment of participation in class, exercises or projects of the course</i>	10	30
<i>Assessment of assignments, projects, reports, memos</i>	30	60
<i>Objective test</i>	30	70

GRADING CRITERIA

ASSESSMENT SYSTEM	ORDINARY EVALUATION	EXTRAORDINARY EVALUATION
<i>Assessment of participation in class, exercises or projects of the course</i>	10	10
<i>Assessment of assignments, projects, reports, memos</i>	40	30
<i>Objective test</i>	50	60

General comments on the evaluations/assessments

- In order to pass the subject it will be necessary to pass individually, with a grade higher or equal to 4, both the Unity and Unreal parts. In case of not passing any of the parts, the final grade of the course will be the lowest grade of both parts. In case of passing both parts, the final grade of the course will be the average of both parts.

Unreal: Evaluation x 50%

Unity: Evaluation x 50%

- Any detection of plagiarism, copying or use of bad practices (such as the use of AIs) in a paper or exam will imply the failure of this work with a zero, the report to the faculty and academic coordinator and the application of the current regulations, which can lead to very serious penalties for the student.
- The use of Smartwatches or cell phones is not allowed during exams. Such devices will have to be put away and out of the student's sight during the exam. The use of cell phones is not allowed during classes
- UNITY:
 - Throughout the course, a project will be carried out with monitoring in the classroom.
 - The objective test consists of developing specific parts of the project in Unity (saving, scriptable, tools).
 - Plagiarism or copying of another student, partially or totally, will result in an automatic failure of the Unity part of all the parts involved. In addition, the university may open disciplinary proceedings against both students, which may even lead to their expulsion.
- UNREAL
 - Throughout the course there will be from 2 to 3 intermediate exercises, which total 40% of the course. Each exercise will include an extra section, where the student will have the opportunity to obtain extra points, which will be weighted with the rest of the exercises, but not with the objective test.
 - The final practical consists of developing a project in UE5 together with a development report, which will account for 50% of the final evaluation.
 - 10% of the mark will be awarded on the basis of class participation and progression in the subject, with the teacher deciding how to assess these points.
 - In order to pass the Unreal part of the course in the ordinary call, it will be necessary to obtain a grade higher or equal to 5 between exams, exercises and participation.

LIST OF REFERENCES (BOOKS, PUBLICATIONS, WEBSITES):

Key references

UnrealEngine 4 AI Programming Essentials by Jie Feng, Peter L. Newton Alex Varanese, Game Scripting Mastery

Learning C# Programmingwithunity 3D por Okita, Alex

Mike McShaffry, David Graham, GameCoding Complete, FourthEdition

<https://unity.com/es>

<https://docs.unrealengine.com/5.0/en-US/artificial-intelligence-in-unreal-engine/>

<https://docs.unrealengine.com/5.0/en-US/networking-and-multiplayer-in-unreal-engine/>

Recommended references

Blueprints Visual Scripting forUnrealEnginebyBrenden Sewell

Learning C# bydevelopinggameswithunity 3D beginner's guide. Norton, Terry UnrealEngine:
GameDevelopmentfrom A to Z by Joanna Lee, John P. Doran, NitishMisra

Mastering Unity 2D GameDevelopment por Jackson, Simon

https://www.youtube.com/playlist?list=PL4G2bSPE_8ukuajpXPIAE47Yez7EAyKMu

REQUIRED MATERIALS, SOFTWARE AND TOOLS

Type of classroom

Projection equipment and whiteboard

Materials:

Laptop, preferably with two monitors

Software:

Unreal

Engine Unity