ACADEMIC PROGRAM

ARTIFICIAL INTELLIGENCE FOR VIDEOGAMES

B.F.A. IN **INTERACTIVE PRODUCT DESIGN**

MODALITY: ON CAMPUS

ACADEMIC YEAR: 2023-2024

Name of the course:	Artificial Intelligence for Videogames
Degree :	Interactive Product Design
Location:	Centro Universitario de Tecnología y Arte Digital
Modulo:	Specialized Design
Area:	Technology for Interactive Products
Year:	4º
Teaching period:	2º
Type:	OP
ECTS credits:	3
Teaching modality:	On campus
Language:	English
Lecturer / Email	Jorge Pablo Yanguas/jorge.yanguas@u-tad.com
Web page:	http://www.u-tad.com/

SUBJECT DESCRIPTION

Area description

This subject belongs to the Specialized Design module and, within it, to the area of Technology for Interactive Products. This area refers to the study and practice of the set of techniques necessary for the acquisition of the necessary knowledge for the technological development of applications and video games, focusing on the most technical part of these.

Subject description

In this subject the student will develop a knowledge of artificial intelligence programming for use in video games, taking the objectives seen in the subjects "Introduction to programming" and "Scripting" further, but implementing them in a creative process of interactive digital products.

It is a subject that will provide the student with the knowledge to be more autonomous in the programming of interactive digital products. It will allow the creation of artificial intelligences in the designed videogames, which allow a greater involvement of automated mechanics.

COMPETENCIES AND LEARNING OUTCOMES

Competencies

BASIC AND GENERAL

GC2 - Knowing how to adapt to change and new situations with flexibility and versatility.

GC6 - Demonstrate motivation for quality.

GC8 - Demonstrate the ability to work in a team.

GC18 - Manage information appropriately.

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

SC1 - Know the language necessary to communicate and structure a coherent discourse in the field of sociology, philosophy and psychology in relation to the design of interactive products.

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.

SC18 - Apply theoretical and practical knowledge of product design for content development.

SC20 - Knowing the determining factors of the consumer market of interactive products, taking into account the knowledge and respect for social and cultural environments.

SC21 - Understand the principles of design applied to multiple consumer devices.

Learning outcomes

Use current game engines to create video games.

Use basic programming to improve the design of non-complex games.

Assessing the artificial intelligence techniques needed for a video game

Adapt a video game or interactive system to different cultures

Defining a game's localization strategy based on social influences

CONTENTS

•   Fundamentals of artificial intelligence in games.

•   Application of AI elements in prototypes.

•   Decision making systems

SUBJECT SYLLABUS

Topic 1. Fundamentals of Artificial Intelligence

Topic 2. Application of AI to games

Topic 3. Path planning

Topic 4. Search methods

Topic 5. Decision-making systems

TRAINING ACTIVITIES AND TEACHING METHODOLOGIES

TRAINING ACTIVITIES

LEARNING ACTIVITIES	Total hours	Hours of presence
Theoretical classes	18,75	18,75
Seminars and workshops	2,50	2,50
Practical classes	6,25	6,25
Tutorials	1,50	1,50
Evaluation Activities	2,50	2,50
Group work and study	5,00	0,25
Autonomous and individual study and work	38,50	0,00
TOTAL	75	32

Teaching methodologies

Expository method/Master lecture

Case studies

Exercise and problem solving

Problem-based learning

TEMPORAL DEVELOPMENT

Topic 1. Fundamentals of Artificial Intelligence: 3 weeks

Topic 2. Application of AI to games: 3 weeks

Topic 3. Path planning: 2 weeks

Topic 4. Search methods: 3 weeks

Topic 5. Decision-making systems: 3 weeks

EVALUATION SYSTEM

ASSESSMENT SYSTEM	MINIMUM SCORE RESPECT TO THE FINAL ASSESSMENT (%)	MAXIMUM SCORE RESPECT TO THE FINAL ASSESSMENT (%)
Assessment of participation in class, exercises or projects of the course	10	30
Assessment of assignments, projects, reports, memos	35	70
Objective test	30	60

GRADING CRITERIA

ASSESSMENT SYSTEM	ORDINARY EVALUATION	EXTRAORDINARY EVALUATION
Assessment of participation in class, exercises or projects of the course	10	10
Assessment of assignments, projects, reports, memos	35	35
Objective test	55	55

General comments on the evaluations/assessments

• You must get a minimum of 5 in each of the parts to get an average and be able to pass the course.

• "Any detection of plagiarism, copying or use of malpractice (such as the use of AIs) in a paper or exam will result in the failure of that paper with a zero, a 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 mobile phones is not permitted during the exams. These devices must be put away and out of sight during the exam.

• The use of mobile phones is not permitted during lessons.

LIST OF REFERENCES (BOOKS, PUBLICATIONS, WEBSITES):

Key references

García Serrano, Alberto. Inteligencia artificial. Fundamentos, prácticas y aplicaciones. Ed. Grupo RC.

Getting Started with Processing. Casey Reas and Ben Fry. Published June 2010,

O'Reilly Media.

Recommended references

The Ruby Programming Language. David Flanagan, Yukihiro Matsumoto. O'Reilly. 2008. ISBN-10: 0596516177. First Edition.

Russell, S. – Norvig, P. Inteligencia artificial, un enfoque moderno.

Programming Ruby 1.9 (3rd edition): The Pragmatic Programmers' Guide. Dave Thomas, with Chad Fowler y Andy Hunt. 2009. ISBN: 978-1-93435-608-1

REQUIRED MATERIALS, SOFTWARE AND TOOLS

Type of classroom
Projection equipment and whiteboard

Materials:
Laptop computer

Software:

Unity