



ACADEMIC PROGRAM

GAME THEORY

B.F.A. IN INTERACTIVE PRODUCT DESIGN

MODALITY: ON CAMPUS

ACADEMIC YEAR: 2023-2024

Name of the course:	Game Theory
Degree :	Interactive Product Design
Location:	Centro Universitario de Tecnología y Arte Digital
Modulo:	Art, Science and Technology
Area:	Foundations of development
Year:	1º
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 has links with the other subjects of the degree since one of the objectives of this degree is the development of interactive projects with special attention to video games. Knowing the theoretical bases of game structure is the basis on which possible developments are based.

Game Theory provides the necessary knowledge to understand the structure of a game and its component parts. For those who want to develop their career within the field of interactive products, it is critical knowledge to be able to develop their work projects. In addition, attention to theory is a pending subject for companies and other training cycles, so its acquisition can be an advantage when it comes to differentiating oneself from other possible candidates for a job. This subject belongs to the branch of game studies with links to human-computer interaction research and leisure studies.

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

- Basic knowledge of simple game structure.
- Victory-defeat strategies
- Games structure and properties

SUBJECT SYLLABUS

1. Introduction to the game theory
 - 1.1. Types of theory in Game Studies
 - 1.2. Types of Games
 - 1.3. Types of Players
 - 1.4. MDA Framework
2. Mathematical game theory and types of mathematical games
 - 2.1. Historical relationship between mathematics and the game with its main elements
 - 2.2. Representation models
 - 2.3. Decision Theory
 - 2.4. VEM
3. Game theory beyond mathematics
 - 3.1. Central concepts
 - 3.2. According to structure
 - 3.3. According to knowledge and winning strategy
 - 3.4. Types of games
4. The formal perspective or the system of rules of games
 - 4.1. Definition and typologies
 - 4.2. The normative function
 - 4.3. The main mechanics
 - 4.3.1. Chance
 - 4.3.2. Skill
5. The material perspective or the ludo-fictional world system
 - 5.1. Ludologists and narratologists within Game Studies
 - 5.2. Modal Logic and the theory of possible worlds

5.3 New perspectives and situationism

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

1. Introduction to the game theory: 2 weeks
3. Mathematical game theory and types of mathematical games: 4 weeks
4. Game theory beyond mathematics: 3 weeks
5. The formal perspective or the system of rules of games: 3 weeks
6. The material perspective or the ludo-fictional world system: 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>	20	20
<i>Assessment of assignments, projects, reports, memos</i>	30	30
<i>Objective test</i>	50	50

General comments on the evaluations/assessments

- 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 that paper 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 class.
- Class participation: the evaluation of participation in class activities will be based on attendance, effort shown and the final level of the avatar, internal activity of the class. Attendance must be at least 80% in order to allow the student the opportunity to sit for the ordinary call.
- Works: the analysis of commercial board games will serve as a model and criterion for the achievement of the objectives of acquisition of the theories that mark the game. It is necessary the delivery of all the analyses and to have at least a 5 in this part of works to be able to make average. The approved works will be kept for the extraordinary evaluation.

- - Final exam: It will have two parts, one will be a partial exam (10% in ordinary and extraordinary) and the other will be the creation of an operative escape room (40% in ordinary and extraordinary of the grade of the course), with similarities to the board games, which must be presented and defended. The knowledge acquired in the theoretical classes on the design process, game theory and decision will be assessed, together with the creation of game mechanics/dynamics/aesthetics. It is necessary to obtain at least a 5 in both parts of the final test, exam and escape room, to pass the course. The parts passed will be kept for the Extraordinary call.

- In Extraordinary the percentages will remain the same as in Ordinary.
- Spelling mistakes in the writing of documents will be reduced by 0.5 per mistake.
- Late work is not allowed. If a student is late, the work will be penalized as follows:

- o < 1 hour late: -0.5 points.

- o 1-4 hours late: -1 point

- o 4-8 hours late: -2 points

- o 24 hours late: failure

LIST OF REFERENCES (BOOKS, PUBLICATIONS, WEBSITES):

Key references

AGUADO Franco, J. C. (2007). Teoría de la decisión y de los juegos. Madrid: Delta publicaciones. ISBN: 978-8496477360

FULLERTON, T. (2004). Game Design Workshop: A Playcentric Approach to Creating Innovative Games. The CRC Press. ISBN: 978-1482217162

SALEN, K. y Zimmerman, E. (2004). Rules of play. Game design fundamentals. MA: The MIT Press. ISBN: 978-0262240451

Recommended references

BELL, R. C. (1979). Board and table games from many civilizations. New York: Dover Publications.

CAILLOIS, Roger (1994). Los juegos y los hombres. Fondo de Cultura Económica.

DEULOFEU, Jordi (2010). Prisioneros con dilemas y estrategias dominantes. Barcelona: RBA.

GIBBONS, R. (1997). Un primer curso de teoría de juegos. Barcelona: Bosch Editor.

HUIZINGA, Johan (2012, 3a ed.). Homo Ludens. Madrid: Alianza Editorial.

PARLETT, David (1999). The Oxford History of Board Games. Oxford: Oxford UniversityPress.

REQUIRED MATERIALS, SOFTWARE AND TOOLS

Type of classroom

Projection equipment and whiteboard.

Materials:

Laptop computer

Software:

Steam

Tabletopia