



# Course guide

## 804252 - ADA - Data Analysis

**Last modified:** 15/09/2024

**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:** 2024    **ECTS Credits:** 6.0    **Languages:** English

### LECTURER

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**Coordinating lecturer:** Loepfe, Lasse

**Others:** Loepfe, Lasse

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Specific:**

CEVJ 12. Analyse and interpret the various data provided by the metrics and indicators of a game in order to improve its balance in terms of design and economic performance.

### TEACHING METHODOLOGY

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The teaching methodology is divided in four parts:

- Sessions for the content's exposition at classroom
- Practical working sessions at classroom
- Practical development of applications with special reference to the Dashboard project
- Autonomous work to study and carry out exercises and activities

### LEARNING OBJECTIVES OF THE SUBJECT

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- Learning and use of the analytical approach applied to the development of video games.
- Knowledge of the main processes necessary for "game analytics".
- Understanding of common problems in the analytical approach, their detection and means for their solution.
- Understanding with the main concepts and KPIs used in the industry.
- Knowledge of the most common tools used in the industry, including web applications, installable applications, languages, file formats, etc ...
- Ability to understand and use the most widespread analytical visualizations.
- Use of the most common basic analytics techniques.
- Familiarity with the most popular and widespread advanced analytics techniques.
- Familiarity with the fundamental equations of the sector.
- Knowledge of the structured approach of an analytics department.
- Show the ability to read and write correctly in English technical documents related to or used in the video game industry, with particular emphasis on the decision about the topics to be covered, the structure of the document, the line of argument, grammatical aspects and technical vocabulary or expressions.



## STUDY LOAD

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

**Total learning time:** 150 h

## CONTENTS

### 1. Introduction

**Description:**

- 1.1 Planning
- 1.2 Adquisition & Storage
- 1.3 Analytics
- 1.4 Presentation

**Related competencies :**

CEVJ 12. Analyse and interpret the various data provided by the metrics and indicators of a game in order to improve its balance in terms of design and economic performance.

**Full-or-part-time:** 10h

Theory classes: 2h  
Guided activities: 2h  
Self study : 6h

### 2. KPIs

**Description:**

Overview of the most commonly used indicators in game analytics

Number of users: DAU, MAU  
Retention: DAU/MAU, D1,D3,D7  
Monetisation: ARPU, ARPPU  
Marketing: CPI  
Community: Virality  
Performance: FPS, Crashes

**Full-or-part-time:** 10h

Theory classes: 4h  
Self study : 6h



### 3. Data bases

**Description:**

- 3.1 Events
- 3.2 Server structure
- 3.3 SQL
  - 3.3.1 Tables
  - 3.3.2 Queries
  - 3.3.3 Views

**Related competencies :**

CEVJ 12. Analyse and interpret the various data provided by the metrics and indicators of a game in order to improve its balance in terms of design and economic performance.

**Full-or-part-time:** 30h

Theory classes: 4h  
Guided activities: 8h  
Self study : 18h

### 4. Visualization

**Description:**

- 4.1 General considerations of visualization
- 4.2 Business intelligence software

**Related competencies :**

CEVJ 12. Analyse and interpret the various data provided by the metrics and indicators of a game in order to improve its balance in terms of design and economic performance.

**Full-or-part-time:** 20h

Theory classes: 2h  
Guided activities: 6h  
Self study : 12h

### 5. Case studies

**Description:**

- 5.1 Level progression
- 5.2 Spatial Data
- 5.3 Level Design
- 5.4 IAP

**Related competencies :**

CEVJ 12. Analyse and interpret the various data provided by the metrics and indicators of a game in order to improve its balance in terms of design and economic performance.

**Full-or-part-time:** 40h

Theory classes: 4h  
Laboratory classes: 12h  
Self study : 24h



## 6. Statistics

### Description:

- 6.1 Sampling
- 6.2 Regressions
- 6.3 Classification
- 6.4 Networks

### Full-or-part-time: 20h

Theory classes: 4h  
Guided activities: 4h  
Self study : 12h

## 7. Machine Learning and Big Data

### Description:

- 7.1 Uses and abuses of ML
- 7.2 Supervised vs unsupervised learning
- 7.3 Cost function and its optimisation
- 7.4 Regressions
- 7.5 Decision trees
- 7.6 Neural Networks
- 7.7 Support Vector Machine
- 7.8 ML-Agents in Unity

### Full-or-part-time: 20h

Theory classes: 4h  
Laboratory classes: 4h  
Self study : 12h

## ACTIVITIES

### Data Analysis

#### Related competencies :

CEVJ 12. Analyse and interpret the various data provided by the metrics and indicators of a game in order to improve its balance in terms of design and economic performance.

#### Full-or-part-time: 18h

Self study: 18h

### Predictive Models

#### Related competencies :

CEVJ 12. Analyse and interpret the various data provided by the metrics and indicators of a game in order to improve its balance in terms of design and economic performance.

#### Full-or-part-time: 24h

Self study: 24h



## Dashboard

### Related competencies :

CEVJ 12. Analyse and interpret the various data provided by the metrics and indicators of a game in order to improve its balance in terms of design and economic performance.

**Full-or-part-time:** 48h

Self study: 48h

## GRADING SYSTEM

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Practice 1 (Case study 1): 15%

Practice 2 (Case study 2): 20%

Practice 3: 20%

Final exam: 35%

Participation and attitude towards learning: 10%

In case of suspending the subject through continuous evaluation, you will have the option to perform a recovery exam of the theoretical part, corresponding to 35% of the subject's grade.

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

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### Basic:

- Drachen, Anders; Seif El-Nasr, Magy; Canossa, Alessandro, eds. Game analytics: maximizing the value of player data. London: Springer, 2013. ISBN 9781447147688.

- Lovell, Nicholas; Fahey, Rob. Design rules for free-to-play games. London: GAMESbrief, 2012.

- Luton, Will. Free 2 play: making money from games you give away. Upper Saddle River: Pearson Education, 2013. ISBN 9780321919014.

## RESOURCES

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### Hyperlink:

- Game Analytics 101. <https://www.raywenderlich.com/2972-game-analytics-101>