

Course guide

804265 - VDC - Data Visualization

Last modified: 12/02/2024

Unit in charge: Image Processing and Multimedia Technology Centre
Teaching unit: 804 - CITM - Image Processing and Multimedia Technology Centre.

Degree: BACHELOR'S DEGREE IN MULTIMEDIA STUDIES (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN VIDEO GAME DESIGN AND DEVELOPMENT (Syllabus 2014). (Optional subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan

LECTURER

Coordinating lecturer: Molins Pitarch, Carla

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CEM 18.2. Apply new theoretical and practical knowledge related to the creation of content and interactive multimedia applications for use in the areas of: training, health, leisure and entertainment and business and professional activities.

CEM 5.4. Apply the user-centred design method, the basic concepts and principles involved in the process of designing graphical user interfaces, and the implications of creating multimedia interactive computer applications for project management.

CEM 5.7. Apply the planning, inquiry, evaluation, inspection and testing techniques used in interactive multimedia application creation projects in which the user-centred design method is applied.

CEM 1. Be able to solve problems using various systems: analytical, numerical, computer simulation.

CEVJ 3. Apply graphic interface design methodologies in an interactive application based on usability and accessibility criteria, taking the various platforms to which it can be directed into account.

Generical:

CGFB6VJ. Apply the techniques of representation, spatial conception, standardisation and computer-aided design; knowledge of the basics of industrial design.

CGFC5VJ. Efficiently design and use the most appropriate types and structures of data to solve a problem related to the development of video games.

CGFC10VJ. Design and evaluate person-computer interfaces that guarantee accessibility and usability for computer systems, services and applications.

Transversal:

CT2. SUSTAINABILITY AND SOCIAL COMMITMENT: Being aware of and understanding the complexity of the economic and social phenomena typical of a welfare society, and being able to relate social welfare to globalisation and sustainability and to use technique, technology, economics and sustainability in a balanced and compatible manner.

CT4. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.

06 URI N3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

07 AAT N3. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.



TEACHING METHODOLOGY

(ENG)

Hay dos tipos de clases que llamamos Teoría y Práctica.

Como Teoría se quiere decir: contenidos referenciales. Glosario principal. Historia del campo, Estado del arte. Recursos. Libros. Conceptos. Autores / as. Etc.

Como Práctica se hace referencia a todo lo que tiene que ver con el proyecto de visualización de datos que se desarrollará durante el semestre.

Hay sesiones donde los dos tipos de clases se convierten simultáneamente.

La participación es fundamental, ya que se quiere trabajar la capacidad de comunicar ideas a partir de unos datos e informaciones.

LEARNING OBJECTIVES OF THE SUBJECT

1. Know the discipline of data visualization from a theoretical/research point of view.
2. Know the discipline of data visualization from a practical/professional point of view.
3. Understand the mechanisms and psychological processes of attention, perception, memory, learning and emotions and the role they play in the interaction process between humans and computers.
4. Know the methodology and process of creating a data visualization.
5. Know what they are and how to work with data: collect them, transform them, represent them, present them.
6. Know what they are and how to work with data: collect them, transform them, represent them, present them.
7. Critical evaluation of visualization tools
8. Identify personal knowledge needs to work in a transdisciplinary field.
7. Identificar las necesidades personales de conocimiento para trabajar en un campo transdisciplinario.

STUDY LOAD

Type	Hours	Percentage
Hours medium group	40,0	26.67
Guided activities	20,0	13.33
Self study	90,0	60.00

Total learning time: 150 h

CONTENTS

PART A: Fundamentals. Analog Data Display

Description:

Presentation of the subject. Operation of the course.

What is data?

Retrospective history of data visualization.

Class dynamics: Visualization of data in space.

Analog data collection

Analog data analysis

Analog data display.

Full-or-part-time: 10h

Practical classes: 10h



PART B: Consolidation. Digital Data Display

Description:

Visual design and hierarchy.
Anatomy of graphics.
Visual Keys
Coding of information.
Visualization tools.

Full-or-part-time: 46h

Practical classes: 16h
Self study : 30h

PART C: Final Project. Interactive Data Visualization

Description:

Data, Interaction and Society.
Class Dynamics: Data Viz Guerrilla
Storytelling.
Interactivity
Accessibility and responsibility.
Dashboards.

Full-or-part-time: 90h

Guided activities: 30h
Self study : 60h

ACTIVITIES

Activities

Description:

Individual class practices to work on weekly topics.
Group class exercises: Visualization of Data in space, Data Viz Guerrilla to take the subject further.

Full-or-part-time: 10h

Guided activities: 10h

Individual assignments

Description:

Analog Quantified Self Exercise
Quantified Self Digital exercise
Final Project Report.

Full-or-part-time: 50h

Practical classes: 20h
Self study: 30h



Group deliverables

Description:

Interactive Final Project

Full-or-part-time: 75h

Practical classes: 25h

Self study: 50h

GRADING SYSTEM

- Individual class practices - 10%
- Group class practices - 5%
- Analog Quantified Self Exercise: individual deliveries - 20%
- Quantified Self Digital exercise: individual delivery - 20%
- Final Project: group presentation - 25%
- Final Project: Individual Report - 10%
- Participation and learning attitude - 10%
- LLcort: 8 entregas individuals - 20%
- LLvisbasic: 5 entregas individuals - 20%
- LLProjecte: 2 entregas individuals - 30%
- LLGr-visavançades: 2 entregas en grupo - 10%
- LLGr-rediseño: 3 entregas en grupo - 10%
- Participación y actitud de aprendizaje - 10%

En caso de ser necesaria una recuperación de alguna o algunas entregas, esta se hará en formato presencial en línea, con un nuevo listado de presentaciones acordado con el profesor.

No se podrá hacer recuperación del 50% o más de la mitad de entregas.

EXAMINATION RULES.

Part of the practices and exercises can be done during classes with a teacher. Students will also have to devote time to independent work (outside class hours) to carry out these practices and exercises.

To carry out the practicals and exercises, follow the instructions given in the "Statement" document and the instructions that may be given in the corresponding class for this purpose.

The practice or solved exercise must be deposited in the CITM Virtual Campus. Each statement includes a delivery date; only those practices or exercises delivered on the delivery date and before the time marked as a limit for this will be taken into account for the evaluation.

The evaluation of the practices does not only entail the resolution of these, but also the defense of the results when the group is required for this during the classes and the creation of the corresponding documents.

Any incident that does not allow the practice to be resolved within the indicated period must be communicated to the teacher by means of a message via the Virtual Campus; after this communication, the relevance or not of the causes that motivate the non-presentation of the practice will be resolved and the alternatives will be established to complete the evaluation if the causes are justified.

The documents must be completed following the instructions given in them, especially with regard to labeling file names. Under no circumstances will the layout of the document be modified or saved in a format or version other than the one indicated. The correct management of the documentation provided is an aspect related to the skills to be acquired and is, therefore, subject to evaluation.



BIBLIOGRAPHY

Basic:

- Tufte, E. R., Goeler, N. H., & Benson, R.. Envisioning information (Vol. 126). CT: Graphics press, 1990.
- Cairo, A. Functional Art, The: An Introduction to Information Graphics and Visualization. San Francisco, US: New Riders, 2012.
- Cairo, Alberto. How Charts Lie: Getting smarter about Visual Information. Washington: National Geographic Books, 2020.
- Levin, Golan ; Brain, Tega. Code as Creative Medium: A Handbook for Computational Art and Design. Cambridge: MIT Press, 2021.
- Lupi, Georgia ; Posavec, Stefanie. Dear Data. Princeton Architectural Press, 2016.
- Rendgen, Sandra. History of Information Graphics. 2019.
- Thorp, Jer. Living in Data: A Citizen's Guide to a Better Information Future. USA: Picador, 2022.
- Lima, Manuel. The Book of Trees. Princeton Architectural Press,
- Tufte, Edward. Beautiful Evidence. 2006.
- Bremer, NAdieh ; Wu, Shirley. Data Sketches: A Journey of imagination, exploration, and beautiful data visualizations. Boca Raton: CRC Press, 2021.
- Drucker Johanna. Graphesis: Visual Forms of Knowledge Production. 2014.
- Lima, Manuel. The Book of Circles. Princeton Architectural Press, 2017.
- Lima, Manuel. Visual Complexity: Mapping Patterns of Information. Princeton Architectural Press, 2013.
- Bremer, NAdieh ; Wu, Shirley. Data Sketches: A Journey of imagination, exploration, and beautiful data visualizations. Boca Raton: CRC Press, 2021.
- Tufte, Edward. Visual Explanations: Images and Quantities, Evidence and Narrative. 1997.
- Yau, Nathan. Data Points: Visualization That Means Something. Hoboken: John Wiley & Sons, 2013.

RESOURCES

Audiovisual material:

- Recursos Visualització. www.visualisingdata.com/resources
- Papers DataViz. piim.newschool.edu/research/PIIM-PAPER

Hyperlink:

- Graphic presentation. by Brinton, Willard Cope, 1939. <https://archive.org/details/graphicpresentat00brinrich/mode/2up>- Catàleg visualitzacions. Resource
- Lima, M. (2011). Visual complexity. <http://www.visualcomplexity.com>.

Other resources:

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