# Information visualization

**Academic Year: ( 2024 / 2025 )** **Review date: 16-05-2024**

**Department assigned to the subject: Library and Information Sciences Department**

**Coordinating teacher: OLMEDA GOMEZ, CARLOS**

**Type: Compulsory ECTS Credits : 3.0**

**Year : 1 Semester : 1**

## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

There are no specific course prerequisites for this course

## OBJECTIVES

BASIC SKILLS
CB9 That students know how to communicate their conclusions and the latest knowledge and reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way
GENERAL COMPETENCES
CG 5 Recognize the growing importance of teamwork in the workplace and demonstrate adaptability and integration in different work environments, maintaining fluid relationships and communications.
CG 9 Integrate knowledge, formulate judgments and communicate their conclusions, as well as the latest knowledge and reasons that support them, to specialized and non-specialized audiences in a clear and unambiguous way.
CG 11 Ability to interpret, apply and innovate in context methodologies, technologies and new methods of analysis, treatment and information retrieval.
SPECIFIC COMPETENCES
CE 7 Representation of scientific knowledge and epistemic communities, using data mining and network analysis techniques.
CE 9 Acquire the necessary knowledge to prepare the Master's Final Project, academic papers, reports or similar documents, in an appropriate way, both from the formal point of view and from the content perspective.

LEARNING OUTCOMES
1. Apply the fundamental principles of data retrieval, through the manipulation of bibliographic databases of indexed scientific literature.
2. Constructs science maps and designs and implements projects to support research into a real community or issue.

## DESCRIPTION OF CONTENTS: PROGRAMME

1. Infovis overview.
2. Statistical visualisation types.
3. Topic visualizations.
4. Network visualizations.

## LEARNING ACTIVITIES AND METHODOLOGY

TRAINING ACTIVITIES OF THE CURRICULUM RELATED TO SUBJECTS
AF1 Individual work for the study of theoretical and practical materials developed and contributed by the teacher.
AF2 Individual work for problem solving and case studies.
AF3 Theoretical-practical classes.
AF4 Tutorials.
AF5 Group work.

AF6 Active participation in forums enabled by the teacher in the virtual educational platform.
AF7 Perform self-assessment test for content review.
AF8 Synchronous online debates and colloquiums

| Code Activity | Is it synchronous? | Total hours | Onsite Hours | % Onsite | Hours of synchronous interactivity |
|---|---|---|---|---|---|
| AF1 | NO | 25,7 | 0 | 0 | 0 |
| AF2 | NO | 20 | 0 | 0 | 0 |
| AF3 | SI | 3 | 3 | 50 | 3 |
| AF4 | SI | 3 | 0 | 0 | 3 |
| AF5 | NO | 31 | 0 | 0 | 0 |
| AF6 | NO | 1,3 | 0 | 0 | 0 |
| AF7 | SI | 3 | 0 | 0 | 3 |
| AF8 | SI | 3 | 0 | 0 | 3 |
| TOTAL SUBJ.(COURSE) | | 90 | 3 | 50 | 12 |

TEACHING METHODOLOGIES
MD1 Presentations in the teacher's class with support of computer and audiovisual media, in which the main concepts of the subject are developed and the bibliography is provided to complement the students' learning.
MD2 Critical reading of texts recommended by the teacher of the subject:
Press articles, reports, manuals and / or academic articles, either for later discussion in class, or to expand and consolidate the knowledge of the subject.
MD3 Resolution of practical cases, problems, etc. Raised by the teacher individually or in a group.
MD4 Exposition and discussion in class, under the moderation of the professor of subjects related to the content of the subject, as well as of practical cases.
MD5 Preparation of individual and group work and reports.
MD6 Reading of theoretical and practical teaching materials.

TUTORIALS SCHEME
The schedules of the tutorials, adjusted to the disposition by the University, can be consulted in the space of the course in the platform (Aula Global). They will include at least two sections, one for face-to-face and the other for online tutorials. In addition to these official tutorials, students can request and arrange with the teacher online or on-site tutorials outside those times.

## ASSESSMENT SYSTEM

| | |
|---|---|
| **% end-of-term-examination:** | 50 |
| **% of continuous assessment (assigments, laboratory, practicals…):** | 50 |

SE1 Participation in class and forums in virtual educational platform
SE2 Individual or group work done during the course
SE3 Carrying out evaluable and scoring questionnaires
SE4 Exam* and Final Work
SE5 Presentation, content and public defense of TFM

Ordinary call:
Continuous evaluation (50% of the final grade).
SE1 a) Participation in class and forums in virtual educational platform. (10% of the final mark).
SE2 b) Delivery of 2 practical exercises carried out individually, through the design of two visualisations based on a small set of data from the databases proposed by the teacher. Maximum score 40% of the final mark.

In-person test (50% of the final grade). The face-to-face test will be carried out in person, at Carlos III University.
SE3 c) Exam. Questionnaire about contents of the topics and attached materials. Maximum score 10% of the final grade for the course.
SE4 d) Completion and delivery on the day of the face-to-face test via Aula Global of the coursework on the visualisation of scientific literature (data, graphs and essay), carried out in writing and individually. Maximum score 40% of the final mark.

Extraordinary call
In an extraordinary call, in the absence of specific regulations for postgraduate studies, and unless the University establishes otherwise, the student has the right to carry out activities that allow them to

| | |
|---|---|
| **% end-of-term-examination:** | 50 |
| **% of continuous assessment (assigments, laboratory, practicals…):** | 50 |

obtain at least 75% of the maximum grade for the course. These activities may or may not be the same scheduled in the continuous evaluation. These activities will necessarily include a final, face-to-face and compulsory passing exam, which must be taken by those who have not passed the ordinary exam.

## BASIC BIBLIOGRAPHY


- Mazza, Ricardo Introduction to Information visualization, Springer, 2009

- Tufte, Edward R. The visual display of quantitative information. 2nd ed., Graphic Press, 2007

- Yau, Nathan Data points: visualization that means something, John Wiley & Sons, 2013


## ADDITIONAL BIBLIOGRAPHY


- Börner, K., Chen, C., & Boyack, K.W. (2003) Visualizing knowledge domains., Annual Review of Information Science and Technology, 37(1), 179¿255.

- Chen, Ch. (2017) Science mapping. A systematic review of the literature. , Journal of Data and Information Science, Vol. 2 No. 2, 2017 pp 1¿40.

- Kim, M.Ch., Zhu, Y., Chen, Ch (2016) How are they different? A quantitative domain comparison of information visualization and data visualization (2000-2014), Scientometrics (2016) 107, pp. 123 165.

- Nardi P, Di Matteo G, Palahi M, Scarascia Mugnozza G.(2016) Structure and Evolution of Mediterranean Forest Research: A Science Mapping Approach., PLoS ONE 11(5): e0155016..

- Olmeda-Gómez, C., Ovalle-Perandones, MªA., Perianes-Rodríguez, A. (2017) Co-word analysis and thematic landscapes in Spanish information science literature, 1985-2014, Scientometrics 113 (1), 195-217.

- Olmeda-Gómez, C., Romá-Mateo, R., Ovalle-Perandones, Mª A. (2019) Overview of trends in global epigenetic research (2009-2017), Scientometrics, 119 (3), 1545-1574.

- Vargas-Quesada; B; Chinchilla-Rodríguez, Z. & Rodriguez, N. (2017) Identification and Visualization of the Intellectual Structure in Graphene Research, Frontiers in Research Metrics and Analytics. Vol 2. , pp. 1-22..

- White, H.D., & McCain, K.W. (1997). Visualization of literatures, Annual Review of Information Science and Technology, 32, 99-168..

- van Eck, N.J., Waltman, L (2014) Visualizing bibliometric networks. , En Measuring scholarly impact (285-320), Heidelberg: Springer