

## COURSE SYLLABUS

**Academic Year: 2021/2022**

Identification and characteristics of the course			
Code	502287	ECTS Credits	6
Course title (English)	Network Analysis for Information and Documentation		
Course title (Spanish)	Análisis de Redes en Información y Documentación		
Degree programs	Degree in Information and Documentation Degree in Audiovisual Communication PCEO Information and Documentation / Audiovisual Communication PCEO Information and Documentation / Journalism		
Faculty/School	Faculty of Documentation and Communication		
Semester	1 <sup>st</sup>	Course type (compulsory/optional)	Compulsory
Module	Technologies and Practical Application of Information and Documentation		
Subject matter	Metric Studies of Information		
Lecturer/s			
Name	Room	E-mail	Web page
M <sup>a</sup> del Rocío Gómez Crisóstomo	21A	<a href="mailto:mrgomcri@unex.es">mrgomcri@unex.es</a>	
Subject Area	Library and Documentation Sciences		
Department	Documentation and Communication		
Coordinator (Only if there is more than one lecturer)	Vicente P. Guerrero Bote		

Competencies
<b>Basic competences</b>
1. (CB1) That students have demonstrated that they possess and understand knowledge in an area of study that begins at the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, includes also some aspects that involve knowledge from the forefront of their field of study.
2. (CB2) That the students know how to apply their knowledge to their work or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.
3. (CB3) That students have the ability to collect and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant issues of a social, scientific or ethical nature.
4. (CB4) That students can transmit information, ideas, problems and solutions to a specialized and non-specialized audience.
5. (CB5) That students have developed learning skills necessary to undertake further studies with a high degree of autonomy
<b>General Competences</b>
6. (CG3) Knowledge of the information technologies used in the information units and services
7. (CG4) Skills in the management of technologies as an indispensable means in the processes of treatment and transfer of information.
<b>Specific Competences</b>

8. (CE2) Knowledge of the theoretical and methodological principles for the study, analysis, evaluation and improvement of the processes of production, transfer and use of information and scientific activity.

**Transversal Competences**

9. (CT3) Skills in the use of the Internet and generic software (office automation).

10. (CT8) Critical reasoning in the analysis and evaluation of alternatives.

**Contents**

**Course outline**

Networks and graphs in Information and Documentation. Centrality, graphic representation and network pruning.

**Course contents**

Title of unit 1: Fundamentals

Contents of unit 1:

1. Graph Theory
2. Network

Description of practical activities for unit 1: resolution of examples in computer rooms with the help of a spreadsheet and the virtual campus.

Title of unit 2: Software for networks

Contents of unit 2:

1. Introduction
2. Starting
3. Network analysis
4. Graphic visualizations
5. GUESS
6. Network modelling
7. Bibliographic and bibliometric networks

Description of practical activities for unit 2: resolution of examples in computer rooms with the help of a spreadsheet and the virtual campus.

Title of unit 3: Characteristics of networks and their nodes

Contents of unit 3:

1. Density and centrality
2. Brokers and bridges
3. Prestige
4. Characteristics of networks

Description of practical activities for unit 3: resolution of examples in computer rooms with the help of a spreadsheet and the virtual campus.

Title of unit 4: Network structure

Contents of unit 4:

1. Cohesive groups and communities
2. Strata or classes
3. Block modelling
4. Backbone
5. Small Worlds Networks
6. Scale Free Networks
7. Structure of the World Wide Web

Description of practical activities for unit 3: resolution of examples in computer rooms with the help of a spreadsheet and the virtual campus.

**Educational activities**

Student workload (hours per lesson)		Lectures	Practical sessions				Monitoring activity	Homework
Lesson	Total	L	HI	LAB	COM	SEM	SGT	PS
1	28	9			3		0	16
2	37	8			6		0	23
3	37	10			5		2	20

4	37	12			5		0	20
<b>Assessment</b>	<b>11</b>	<b>1</b>						<b>10</b>
<b>TOTAL</b>	<b>150</b>	<b>40</b>			<b>19</b>		<b>2</b>	<b>89</b>

L: Lectures (100 students)  
 HI: Hospital internships (7 students)  
 LAB: Lab sessions or field practice (15 students)  
 COM: Computer room or language laboratory practice (30 students)  
 SEM: Problem-solving classes, seminars or case studies (40 students)  
 SGT: Scheduled group tutorials (educational monitoring, ECTS type tutorials)  
 PS: Personal study, individual or group work and reading of bibliography

### Teaching Methodology

- Explanation in class of the programmed topics.
- Use of teaching material in different types and formats.
- Discussion of the contents.
- Practical application of theoretical knowledge through laboratories, workshops, etc.
- Analysis and resolution of practical problems proposed.
- Follow-up learning activities.
- Self-evaluations.
- Guided experimental activities.

### Learning outcomes

- Know and understand the need for Network Analysis in Information and Documentation.
- Apply basic network indicators and distinguish their different types based on their structures.
- Use community detection methods in practical cases.
- Manage specific software for network analysis.
- Establish and discover the main link structure of a network.
- Know how to use the tools, techniques for visualization and representation of networks and communities.

### Assessment methods

- 1. Continuous evaluation through the network. It will consist of a series of activities, all recoverable, which can be carried out at any time during the course prior to the date of the examination of the corresponding call.
- 2. Final test: Exam where the theoretical evaluation will weigh 60% while the practical problems 40%.
- 3. In case of opting for the global evaluation, the final test will constitute 100% of the final grade. Otherwise, the final test will constitute 40% and the continuous assessment 60%. Although in any case the Final Exam must be passed to pass the subject.

### Bibliography (basic and complementary)

Brandes, U. y Erlebach, T. (Editores). Network Analysis: Methodological Foundations. Springer Berlin Heidelberg: NewYork, 2005.

Chen, C., Ibekwe-SanJuan, F., y Hou, J. (2010). The structure and dynamics of cocitation clusters: A multiple-perspective cocitation analysis. Journal of the American Society for Information Science and Technology, 61(7), 1386-1409. doi: 10.1002/asi.21309.

González-Pereira, B., Guerrero-Bote, V.P. y Moya-Anegón, F. A new approach to the metric of journals' scientific prestige: The SJR indicator. *Journal of Informetrics* 4, no. 3: 379-391. 2010.

Newman, M. E. J. (2003). The Structure and Function of Complex Networks. *SIAM Review*, 64(2), 056115. doi: 10.1137/S003614450342480.

Nooy, W., Mrvar, A., Batagelj, V. *Exploratory Social Network Analysis with Pajek*. Cambridge University Press, 2005.

Pinski, G. y Narin, F. Citation influence for journal aggregates of scientific publications: Theory, with application to the literature of physics. *Information Processing and Management*, 12, 297-312, 1976.

Waltman, L., Eck, N. J. V., y Noyons, E. C. M. (2009). A unified approach to mapping and clustering of bibliometric networks. *Science*, 1-11.

Wasserman, S y Faust, K. *Social Networks Analysis: Methods and Applications*. Cambridge University Press, 1995.

### **Other resources and complementary materials**

The course has a classroom on the Virtual Campus of the University of Extremadura where the main digital resources (topics, presentations, questionnaires, case studies, etc.) are included for the correct follow-up of the same and carrying out the continuous evaluation.

