



Academic year	2017-18
Subject	11632 - Social and Economic Networks
Group	Group 1, 1S
Syllabus	C
Language	English

## Subject

<b>Name</b>	11632 - Social and Economic Networks
<b>Credits</b>	1.44 in-class (36 hours) 4.56 distance (114 hours) 6 total (150 hours).
<b>Group</b>	Group 1, 1S (Campus Extens)
<b>Period</b>	First semester
<b>Language</b>	Catalan

## Lecturers

Lecturers	Office hours for students					
	Starting time	Finishing time	Day	Start date	End date	Office
Francesc Andreu Rosselló Llompart <a href="mailto:cesc.rossello@uib.es">cesc.rossello@uib.es</a>	08:30	10:00	Thursday	01/09/2017	31/01/2018	Son Espases
	08:00	09:00	Wednesday	01/02/2018	31/07/2018	Despatx 145, Anselm Turmeda
	08:00	09:00	Tuesday	01/02/2018	31/07/2018	145, Anselm Turmeda

## Context

One common hypothesis of network theory is that an actor's position in a network determines in part the constraints and opportunities that she will encounter. Therefore identifying her position is important for predicting her outcomes, decisions, behaviors, and beliefs. The aim of this course is to set the basic network theory concepts and provide the analytical tools to extract and understand an actor's position in big networks and its implications from the sociological and economic perspectives. It implies, for example, retrieving, analyzing, understanding and managing the information from the relationships among organizations, individuals, or from the person's behavior (revealed preferences), etc.

## Requirements

## Skills

## Specific

- \* CE3. Capacidad para identificar actores centrales, relaciones de influencia y de poder, así como para identificar patrones de intercambio, en redes sociales..
- \* CE6. Saber sintetizar y describir una gran cantidad de datos seleccionando los estadísticos adecuados al tipo de variables y analizar las relaciones existentes entre ellas..



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- \* CE12. Capacidad para entender los beneficios del análisis de datos y los elementos que intervienen en el proceso; aplicarlos en la resolución de problemas; elegir las técnicas más adecuadas a cada problema; aplicar de forma correcta las técnicas de evaluación y saber interpretar los modelos y resultados..
- \* CE20. Conocer y utilizar las diferentes técnicas de regresión para el diagnóstico, evaluación, inferencia y posterior toma de decisiones..

### Generic

- \* CG3. Conocer las principales aplicaciones de la ciencia de datos y de las tecnologías asociadas a la economía, empresa y turismo..
- \* CG4. Comprender y utilizar el lenguaje y las herramientas asociadas al análisis de datos para modelizar y resolver problemas complejos, reconociendo y valorando las situaciones y problemas susceptibles de ser tratados utilizando dichas herramientas y las técnicas asociadas..

### Basic

- \* You may consult the basic competencies students will have to achieve by the end of the Master's degree at the following address: [http://estudis.uib.cat/master/comp\\_basiques/](http://estudis.uib.cat/master/comp_basiques/)

## Content

### Theme content

1. Mathematical aspects of social and economic networks.
  - \* Examples of social and economic networks
  - \* Graph theoretical basic concepts
  - \* Measures on a network
  - \* Role assignment
  - \* Fundamental random network models
  - \* Network structure analysis
  - \* Diffusion on networks.
  - \* Learning on networks.
  - \* Exploring networks with R
2. Introduction to game theory
  - \* Basic notions, equilibrium concepts and examples
  - \* Evolutionary game theory
3. Applications of game theory to networks
  - \* Modeling network traffic
  - \* Strategic network formation
  - \* Networked markets
  - \* Matching markets
  - \* Bargaining and power in networks
4. Networks and social behavior
  - \* Social capital
  - \* Identity and trust in networks
  - \* Implications on social performance
5. Network applications to business economics
  - \* Individual communication and performance
  - \* Inter and intrafirm networks and economic performance



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\* Formal vs. informal structure

## Teaching methodology

### Workload

The number of classroom sessions indicated in this teaching guide is the officially foreseen in the curriculum, and it needs not correspond to those programmed in this year's course agenda. The proposed distribution of classroom work volume among the different activities is indicative, and represents only the planning of the subject by the teachers, without taking into account all the unforeseen events that may arise during the course.

As for the distribution of non-presential work, it is also orientative and represents the ideal distribution planned by teachers, but each student has to find the distribution that best suits her/him.

### In-class work activities

Modality	Name	Typ. Grp.	Description	Hours
Theory classes	Lectures	Large group (G)	Interactive and participative exposition of teaching materials.	20
Seminars and workshops	Seminars	Medium group (M)	Students will summarize and criticize papers they have read.	6
Practical classes	Hands-on network analysis	Medium group (M)	Laboratory sessions for understanding the mathematical principles of networks and analyzing network structure. Professors may ask you to deliver the corresponding reports.	8
Assessment	Final exam	Large group (G)	A final exam on the most basic concepts of the course	2

At the beginning of the semester a schedule of the subject will be made available to students through the UIB digital platform. The schedule shall at least include the dates when the continuing assessment tests will be conducted and the hand-in dates for the assignments. In addition, the lecturer shall inform students as to whether the subject work plan will be carried out through the schedule or through another way included in the Campus Extens platform.

### Distance education work activities

Modality	Name	Description	Hours
Group or individual self-study	Homework	Students will solve problems and exercises related to the contents of the course. Some of these exercises will have to be delivered for grading	40
Group or individual self-study	Readings	Students will be required to read and understand one or more papers to be explained in seminars.	14
Group or individual self-study	Study	Personal study of the material	60

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### Specific risks and protective measures

The learning activities of this course do not entail specific health or safety risks for the students and therefore no special protective measures are needed.

## Student learning assessment

### Seminars

Modality	Seminars and workshops
Technique	Papers and projects ( <b>non-retrievable</b> )
Description	Students will summarize and criticize papers they have read.
Assessment criteria	
Final grade percentage:	25%

### Hands-on network analysis

Modality	Practical classes
Technique	Real or simulated task performance tests ( <b>non-retrievable</b> )
Description	Laboratory sessions for understanding the mathematical principles of networks and analyzing network structure. Professors may ask you to deliver the corresponding reports.
Assessment criteria	
Final grade percentage:	25%

### Final exam

Modality	Assessment
Technique	Objective tests ( <b>retrievable</b> )
Description	A final exam on the most basic concepts of the course
Assessment criteria	
Final grade percentage:	25%

### Homework

Modality	Group or individual self-study
Technique	Extended-response, discursive examinations ( <b>non-retrievable</b> )
Description	Students will solve problems and exercises related to the contents of the course. Some of these exercises will have to be delivered for grading
Assessment criteria	
Final grade percentage:	25%

## Resources, bibliography and additional documentation





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The course will be mostly based on the two textbooks mentioned as basic bibliography. We provide links where preliminary (but sufficient for our purposes) versions can be legally and freely downloaded from.

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### **Basic bibliography**

Easley, D., & Kleinberg, J. (2010). *Networks, crowds, and markets: Reasoning about a highly connected world*. Cambridge University Press. Legal and free download from <https://www.cs.cornell.edu/home/kleinber/networks-book/>

Jackson, M. O. (2008). *Social and economic networks*. Princeton: Princeton university press. Legal and free download from <http://web.stanford.edu/~jacksonm/netbook.pdf>

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### **Complementary bibliography**

Borgatti, S. P., Everett, M. G., & Johnson, J. C. (2013). *Analyzing social networks*. SAGE Publications Limited.

Burt, R. S. (2005). *Brokerage and closure: An introduction to social capital*. Oxford university press.

Scott, J. (2012). *Social network analysis*. Sage.

