University of the Balearic Islands

Teaching guide

Academic year	2014-15
Subject	11015 - Collective Phenomena in Social Dinamics
Group	Group 1, 2S
Teaching guide	C
Language	English

Subject identification

Subject 11015 - Collective Phenomena in Social Dinamics
Credits 0.75 de presencials (18.75 hours) 2.25 de no presencials (56.25 hours) 3 de totals (75 hours).
Group Group 1, 2S
Teaching period 2nd semester
Teaching language English

Professors

Lecturers	Horari d'atenció als alumnes					
	Starting time	Finishing time	Day	Start date	Finish date	Office
José Javier Ramasco Sukia jramasco@ifisc.uib-csic.es	You need to book a date with the professor in order to attend a tutorial.					
Maximino San Miguel Ruibal msr260@uib.es	14:00h	15:00h	Wednesday	01/09/2014	19/07/2015	IFISC 213

Contextualisation

This course provides an introduction to the research area of collective social phenomena and socio-technical systems using the concepts and methods of statistical and nonlinear physics.

Requirements

Concepts needed in this course can be acquired in the compulsary courses of the Structural Module

Skills

Specific

* E3: Capacity for analysis and visualization of numerical data and knowledge of interactive interfaces.

Generic

* TG1: To be able to describe, both mathematically and physically, complex systems in different situations.
* TG2: To acquire the capacity to develop a complete research plan covering from the bibliographic research and strategy to the conclusions..
* TG3: To write and describe rigorously the research process and present the conclusions to an expert audience..

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* TG4: To acquire the ability to ask questions, read and listen critically and participate actively in seminars and discussions..
* TG5: To knowing to disseminate and present the concepts acquired at a non-expert..
* TG6: To acquire high power computation skills and advanced numerical methods capabilities in applications to problems in the context of complex systems..
* TG7: To acquire skills making possible the dialogue and cooperation with researchers with different backgrounds, including social scientists..

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/

Content

Theme content

1. Physics and Social Sicences. Social Consensus
2. Consensus by imitation: Voter Model
3. Language competition dynamics
4. Axelrod model for dissemination of culture
5. Schelling´s segregation model
6. Threshold´s models: Bounded confidence and Granovetter model
7. Game Theory. Cooperation
8. Minority game. El Farol problem
9. Diffusion and contagion processes
10. Sociotechnical systems. Big Data

Teaching methodology

In-class work activities

Modality	Name	Typ. Grp.	Description	Hours
Theory classes	Lectures	Large group (G)	Students will be exposed to the basic concepts and methodologies in the description and modelling of collective social phenomena.	15
Assessment	Oral presentation	Large group (G)	Oral presentations of numerical simulations and a specific follow-up of subjects explained in the lectures	3.75

At the beginning of the semester a schedule of the subject will be made available to students through the UIBdigital 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.

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Distance education work activities

Modality	Name	Description	Hours
Group or individual self-study	assignements	Numerical simulations of results described and explained in the lectures.	20
Group or individual self-study	Preparation of oral presentation	The student will learn about a specific follow-up subject of the theoretical lectures	36.25

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

Lectures

Modality	Theory classes
Technique	Other methods **(non-retrievable)**
Description	Students will be exposed to the basic concepts and methodologies in the description and modelling of collective social phenomena.
Assessment criteria	Participation and questions during the lectures

Final grade percentage: 15%

Oral presentation

Modality	Assessment
Technique	Oral tests **(non-retrievable)**
Description	Oral presentations of numerical simulations and a specific follow-up of subjects explained in the lectures
Assessment criteria	Quality of contents
	Presentation
	Answer to questions

Final grade percentage: 40%

assignements

Modality	Group or individual self-study
Technique	Oral tests **(non-retrievable)**
Description	Numerical simulations of results described and explained in the lectures.
Assessment criteria	Quality of contents
	Presentation

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Answer to questions

Final grade percentage: 35%

Preparation of oral presentation

Modality	Group or individual self-study
Technique	Oral tests **(retrievable)**
Description	The student will learn about a specific follow-up subject of the theoretical lectures
Assessment criteria	Initiative and search for material in the subject

Final grade percentage: 10%

Resources, bibliography and additional documentation

Basic bibliography

-C. Castellano, S. Fortunato, V. Loretto, *Statistical Physics of social dynamics,* Rev. Mod. Phys. 81, 509 (2009)
-P. Sen and B. Chakrabarti, *Sociophysics*, Oxford Univ. Press 2014
-Journal of Statistical Physics **151**, 1-783 (2013): *Statistical Mechanics and Social Science*s
- R. Axelrod, *The complexity of cooperation: Agent based models of competition and collaboration*, Princeton Univ. Press (1997)
-N. Boccara, *Modeling Complex Systems*, Springer-Verlag 2nd ed. 2010. Ch. 6.8, 6.9
-P. Ball:
Critical Mass: How one thing leads to the other (2004)
The physical modelling of human social systems, Complexus **1**, 190-206 (2003)
Why society is a complex matter, Springer (2012)

Complementary bibliography

http://ifisc.uib-csic.es/research/research_social.php
Interactive computer simulations in http://ifisc.uib-csic.es/research/research_complex.php

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