

Academic Year: 2019/2020			
Course: Geographic Modelling and Complex Urban Systems			
Coordinator: Paulo Morgado			
Teaching Staff: Paulo Morgado			
ECTS:	6	Weekly Hours:	3h Typology: Theoretical and Practical
Contents			
1. Modelling in Geography 1.1. Modelling phases 1.2. Models classification 1.3. Landuse and location models 1.4. Spatial interaction models: The gravity model 1.5. Spatial diffusion models 2. Complexity (The Science of complexity) 2.1. Characteristics of a complex system 2.2. The complexity of geographic analysis: case study's 3. Complex system models 3.1. Graph Theory 3.2. Complex networks 3.3. Artificial Neural Networks 3.4. Cellular Automata 3.5. Fractals			
Objectives and skills			
Objectives <ul style="list-style-type: none"> What is and what it means "The New Science of Complexity", and what it means for Geographical studies; Know and identify the main characteristics of a complex system; Know the tools and methods for complex system analysis. Skills <ul style="list-style-type: none"> Know how to design and implement a complex systems analysis model; Know what method suites better any geographical problem; Develop scripting skills 			
References			
Batty, M., Xie, Y. (1994), From cells to cities. Environment and Planning B: Planning and Design, 21, pp. 531-548. Batty, M. (2005). Cities and Complexity. MIT Press. London. Rana, D.L. (2010). MODELS, THEORY & SYSTEMS ANALYSIS IN GEOGRAPHY. AAG. In https://www.semanticscholar.org/paper/MODELS-%2C-THEORY-%26-SYSTEMS-ANALYSIS-IN-GEOGRAPHY-Rana/d3b6f20f6abe3d974b861568d5ed5119dec8d931 Morgado, P. (2011), Efeito Estruturante das Redes de Transporte no Território. Modelo de Análise. Modelação, Ordenamento e Planeamento Territorial. Capítulos 2 e 3. ISBN: 978-972-636-219-7. In http://www.mopt.org.pt/outras-publicaccediltildees.html . Rocha, J. (2012), Sistemas Complexos, Modelação e Geosimulação da Evolução de Padrões de Uso e Ocupação do Solo. Capítulos 1, 4 e 5. In http://repositorio.ul.pt/handle/10451/6772 .			
Knowledge evaluation methods and their partial grades			
1 Individual teste (35% of the final grade); 1 Practical assignment (maximum of 2 elements) (55%); Practical exercises in classroom (10%).			