





4 credits

30.0 h + 15.0 h

Q2

Teacher(s)	Masquelier Bruno ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	As a matter of illustration, here are possible topics: - conflict and cooperation - voting - measurement of power - social choice - fair division
Aims	<p>1 This course is an introduction to mathematical modelization in social sciences at large (economics, political science, sociology, law). It is not a course in mathematics and the prerequisite do not go beyond the basic college mathematics. Its aim is to help students to develop an analytical capacity through a systematic and rigorous use of simple concepts of game and decision theory.</p> <p>-----</p> <p><i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i></p>
Evaluation methods	<p>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</p> <p>A written exam organized in the regular session, combining practical exercises and multiple-choice questions.</p>
Teaching methods	<p>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</p> <p>The course is structured around lectures and practical work. Participation in sessions of practical work is required.</p>
Content	<p>LPOLS 1114 provides an introduction to different types of formalization of social phenomena, allowing the analysis of themes specific to the social sciences (economics, political science, sociology, etc.). It aims to give students an analytical ability based on a systematic approach by borrowing simple concepts from mathematics, game theory, and the fields of simulation in the social sciences.</p> <p>At the end of this course, students will be able to</p> <ul style="list-style-type: none"> • to understand the value of formalization for the social sciences and to recognize the main tools used in this field, • to build models of strategic situations and analyze them using cooperative and non-cooperative game theory, • to use computer simulation of social phenomena using a programming environment (NetLogo). • to read and use references in English independently. <p>Topics covered:</p> <ol style="list-style-type: none"> 1. Introduction: what is formalization and modeling in the social sciences? 2. Mathematics for the social sciences: sets, relationships, matrices, functions, permutations and combinations. 3. Introduction to the theory of non-cooperative games: dominant and dominated strategies, Nash equilibrium, sequential games. 4. Introduction to cooperative game theory: the problem of stable matches, collective choices, equitable distribution, power indices. 5. Social science simulations: micro-simulations and multi-agent models. 6. Introduction to social network analysis. 7. <p>The course consists of a series of lectures completed by exercises.</p>
Bibliography	<p>E.Y. Gura and M. Maschler. Insights into Game Theory : An Alternative Mathematical Experience. Cambridge University Press, 2008.</p> <p>C.A. Lave and J.G. March. An introduction to models in the social sciences. University Press of America, 1993.</p> <p>Bonacich, P. and Lu, P., Introduction to Mathematical Sociology, 2012, Princeton University Press</p>
Other infos	Prerequisite: None Rating: written examination. Support: lecture notes
Faculty or entity in charge	ESPO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Bachelor in Human and Social Sciences	HUSO1BA	4		
Bachelor in Political Sciences: General	SPOL1BA	4		
Bachelor in Sociology and Anthropology	SOCA1BA	4		
Minor in Human and Social Sciences	MINHUSO	4		
Bachelor in Philosophy, Politics and Economics	PPE1BA	5		