

## Social Networks: Theory and Applications

**Teacher:** Marie Laclau

**Duration:** 12 hours

**Number of ECTS credits:** 2

Education Level	Period	Language of instruction	Max. Staffing	Teaching Mode
Master	S2	English	25	in-person

**Deanship Department:** Economics and Decision Sciences

**Domain:** Economics

**Track:**

**Keywords:** Economics, networks.

### SYNOPSIS

This course aims at better understanding social networks via an economic approach based on incentives. Social networks prove to be crucial in many social and economic situations, for instance in the transmission of information about job opportunities, in the trade of many goods and services, in determining which products to buy, how to vote, in assessing which individuals are more powerful to bargain etc.

### DETAILED DESCRIPTION

**Prerequisites:** Basic understanding of game theory and microeconomics, with minimal mathematical requirements.

**Course overview:** Social networks represent relationships among people/firms/etc, describing the social structure of interaction, cooperation, communication, or enforcement. They prove to be crucial in many social and economic situations, for instance in the transmission of information about job opportunities, in the trade of many goods and services, in determining which products to buy, how to vote, in assessing which individuals are more powerful to bargain etc. This course is designed to provide students with a better understanding of social networks. We start by modeling networks, then we study diffusion and learning in networked environments, games and interactions on networks, bargaining, network formation. Important applications include risk sharing and microfinance; job searching; the spread of information, and diseases; collusion; and local public goods.

**Pedagogical Objectives:** The objective of the class is to equip students with tools and insights to analyze social networks. We draw from several disciplines, including sociology, mathematics, physics, and computer science, but emphasize an economic approach based on incentives. After the class, students will have a better understanding on how social network structures impact behavior, which network structures are likely to emerge in a society, and why we organize ourselves as we do.

**Course organization:** 4 sessions of 3 hours.

**TEACHING MATERIALS**

**Books:**

Sanjeev GOYAL. Connections: An introduction to the economics of networks. Princeton, NJ: Princeton University Press, 2007.

Matthew O. JACKSON. Social and economic networks. Princeton, NJ: Princeton University Press, 2008.

Matthew O. JACKSON. The human network: how your social position determines your power, beliefs, and behaviors, 2019.

David EASLEY & Jon KLEINBERG. Networks, crowds, and markets. Cambridge, UK: Cambridge University Press, 2010

**TEACHING METHODS**

Slides and blackboard. Exercises sessions will be organized in class.

**WORK AND EVALUATIONS**

**Work requested:** Exercises will be prepared before classes.

**Assessment of achievement:**

Tool/method of evaluation	Duration	Weight in the final grading
Report on a research paper		50%
Final Exam	1h	50%

**BIOGRAPHY**

Marie Laclau is a CNRS researcher member of the GREGHEC and research associate professor at HEC. She earns a PhD from HEC in 2012 for which she was awarded the prize of the best thesis in Economics from the Association Française de Sciences Economiques. She then conducted post-doctoral research and taught at Yale University (Cowles Foundation) before joining Paris School of Economics then HEC. Her research interests are about game theory, and more particularly about the strategic use of information and communication, repeated games and networks. Her research has been published in Theoretical Economics, Mathematics of Operations Research, Journal of Economic Theory, and Games and Economic Behavior. She was the coordinator of the ANR project CIGNE (2015-2021). At HEC, she teaches social networks, game theory and microeconomics.

**WAIVER POLICY**

None