

# **Economic and Financial Networks: Models and Analysis**

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The objective of this course is to learn how to model economic and financial networks and analyse their impacts. How do networks form, what structures do they form, why do they exhibit certain patterns, and how does their structure impact diffusion, systemic risk, robustness, and other behaviours. The course starts with some empirical background on economic networks, and an overview of concepts used to describe and measure networks. Then, the different models and techniques will be introduced that come from economics, sociology, math, physics, statistics and computer science. Special emphasis will be given to networks which supply the basic foundation for economic and social activity: transportation, energy, financial networks and labor networks.

The objective of the course is to help students understand how to model different networks, understand different methodologies, and uncover mechanisms behind phenomena that take place on networks. Special emphasis will be given to the interpretation of the parameters used to characterize networks.

The course will be organized in four classes comprising the following topics:

1. Graphs and Networks: links, properties, measures and applications: graphs as relationship models, most common structures, types of links, node roles, etc.
2. Network dynamics. Financial networks.
3. Power Grid Networks: avalanches, blackouts. Application to Argentina
4. Labor Networks: skill relatedness indicator, Industry space. Particular case of Argentina