**Course prerequisites**

The equivalent of a first‐year Ph.D. sequence in econometrics. Specifically, an understanding of probability and inference at the level of Casella and Berger (1990, *Statistical Inference*), linear regression analysis at the level of Goldberger (1991, *A Course in Econometrics*), some exposure to nonlinear, especially discrete choice, models (e.g., probit, logit) and a basic knowledge of applied linear and matrix algebra. A basic knowledge of non-linear panel data analysis, as well as of game theory would be useful, but is not required.

**Learning objectives**

Students, using a series of examples, will learn how to interpret empirical research related to social and economic networks. They will also learn the underlying theory of such models as well as how to apply them in their own research (including methods of computation using the Python programming language). Some exposure to methodological research topics will also be provided.

At the end of the course students will be proficient consumers of research on social and economic networks and also have some facility in conducting such research themselves.

**Course content**

This course provides an overview of econometrics methods suitable for the analysis of network data. Many social and economic activities are embedded in networks. Furthermore, datasets with natural graph theoretic structure are increasingly available to empirical researchers (e.g., matched employee‐employer data, buyer‐supplier networks, recommender systems etc.). We will study (i) how to display and summarize network data, (ii) how to fit and interpret formal econometric models of network formation (including models admitting unobserved heterogeneity and allowing for strategic interaction among agents) and, finally, (iii) how to study behaviors which occur on networks (i.e., the identification of peer group effects and other spillovers).

Attention will be given to underlying econometric theory, empirical applications as well as computation.

**Course structure and indications of the learning and teaching design**

Class will be lecture based, albeit with amply time for student questions and discussion. Computation will be discussed and illustrated in class using Jupyter Notebooks and the Python programming language.

**Course literature**

A detailed listed of course readings will be made available to students immediately prior to the start of class. Special use will be made of the book *The Econometric Analysis of Network Data* by Bryan Graham and Aureo de Paula (2019, Academic Press) as well as

the *Handbook of Econometrics 7A* survey chapter on ʺNetwork Dataʺ by Bryan Graham (2010, Elsevier). Students are encouraged to share papers of interest with the instructor for possible class discussion.