

**Title:** Network Analysis

**Name of professor:** Prof. Silvia Rita Sedita

## **Objective**

The course will provide an overview of basic analytical tools available in order to investigate the network structure of a phenomenon. Inter-organizational and interpersonal relationships can be mapped through social network analysis tools and network and individual properties might be explored. The course will offer a discussion on fundamentals and more recent works in the field of network management, with a special emphasis on innovation networks, and their spatial dimension, as well as on the uses of networks in conducting systematic literature reviews.

## **Topics**

### **1. Fundamentals of network analysis**

*Central questions in this session:*

- What is network analysis, and how does a social network approach differ from “classic/standard” research?
- How can we (best) visualize networks? What programs are available?
- What is network density?
- Which are the main measures of centrality in a network? What is the difference between degree, closeness and betweenness centrality?
- When is a network centralized, and why is it important? How can we measure it?

### **2. The importance of innovation networks**

*Central questions in this session:*

- How do networks differ from other organizational structures?
- Which are the advantages of network structures?
- What is the role of networks in innovation processes?
- How can we measure innovation networks?
- How can network analysis be used to investigate open innovation strategies of organizations?

### **3. The spatial dimension of networks**

*Central questions in this session:*

- How does social network analysis help understanding local and distant knowledge flows in clusters and industrial districts?
- Can we define central actors in clusters? What does it mean?
- How can we use network analysis to investigate network relationships along the supply chain?

### **4. Networks of science**

*Central questions in this session:*

- How network analysis can be used to conduct systematic literature reviews?
- Which are the main tools available to detect foundational works and future research trajectories?
- How can we map the evolution of a scientific field?

## **Course Evaluation**

The final evaluation will be based on an oral presentation supported by visual tools, such as Power Point slides, where the students discuss recent applications of network analysis in a scientific field close to their research interests.

## References

### Required Texts

Hanneman, R. A. and Riddle M. 2005. Introduction to social network methods. Riverside, CA: University of California, Riverside ( published in digital form at <http://faculty.ucr.edu/~hanneman/> )

### Readings

- Bathelt H, Malmberg A, Maskell P (2004), Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation, *Progress in Human Geography* 28(1), 31-56.
- Belussi F., Sammarra A., Sedita S.R. (2010), Learning at the boundaries in an “Open Regional Innovation System”: A focus on firms’ innovation strategies in the Emilia Romagna life science industry, *Research Policy*, 39 (6), 710-721. <https://doi.org/10.1016/j.respol.2010.01.014>
- Blasi S., Sedita S.R. (2022) Mapping the emergence of a new research field: an exploration of the intellectual structure of the B Corp research. *Corporate Social Responsibility and Environmental Management*, 29 (1): 107-123. <https://doi.org/10.1002/csr.2187>. Open access.
- Giuliani, E., & Bell, M. (2005). The micro-determinants of meso-level learning and innovation: evidence from a Chilean wine cluster. *Research Policy*, 34(1), 47-68.
- Laursen, K., & Salter, A. (2006). Open for Innovation: The Role of Openness in Explaining Innovation Performance Among U.K. Manufacturing Firms. *Strategic Management Journal*, 27(2), 131–150.
- Lazzeretti L., Sedita S.R., Caloffi A. (2014) Founders and disseminators of cluster research. *Journal of Economic Geography*, 14(1): 21-43. <https://doi.org/10.1093/jeg/lbs053>.
- Morrison, A. (2008) Gatekeepers of knowledge within industrial districts: Who they are, how do they interact? *Regional Studies*, 42(6), pp. 817–835.
- Owen-Smith, J., & Powell, W. W. (2004). Knowledge networks as channels and conduits: The effects of spillovers in the Boston biotechnology community. *Organization Science*, 15(1), 5-21
- Powell, W. 1990. Neither market nor hierarchy: network forms of organisation. *Research in Organization Behaviour*, 12: 295–336.
- Powell, W. W., Koput, K. W., & Smith-Doerr, L. (1996). Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology. *Administrative Science Quarterly*, 41: 116-145.
- Sedita, S.R., Apa, R. (2015). The impact of inter-organizational relationships on contractors' success in winning public procurement projects: The case of the construction industry in the Veneto region. *International Journal of Project Management*, 33(7), 1548-1562.
- Sedita, S.R., Caloffi A., Lazzeretti L. (2020) The invisible college of cluster research: a bibliometric core-periphery analysis of the literature. *Industry and Innovation*, 27(5), 562-584, <https://doi.org/10.1080/13662716.2018.1538872>.
- Sedita, S.R., Hoffmann V.E., Guarnieri P., Toso Carraro E. (2021) Prosecco has another story to tell: the coexistence of multiple knowledge networks in the same value chain. *International Journal of Wine Business Research*. 33(4), 502-522. <https://doi.org/10.1108/IJWBR-06-2020-0024>. Open access.

### Additional Material

- Wasserman, S., Faust, K. 1994. *Social Network Analysis: Methods and Applications*. Cambridge University Press.
- Kilduff, M., Tsai, W. 2003. *Social Networks and Organizations*. Sage.
- Scott, J. 2000. *Social Network Analysis*. Newbury Park CA, Sage.
- Borgatti, S.P., Everett, M.G., Johnson, J.C. 2013. *Analyzing Social Networks*. London, Sage.