

**Interdisciplinary
International Relations/Political Science**

Academic year 2025-2026

Social Networks Theories and Methods

MINT311/RISP176 - Autumn - 6 ECTS

Course Description

Networks represent the structure of how entities are related. Researchers of politics, sociology, economics, history, and law employ networks to analyse and model social and political structures and the agency of actors to construct and change them. This introductory course aims to enable students to be discriminating consumers of network literature and intermediate users of network techniques. We will learn core theories, measures, and models used in social and political networks, and discuss how networks are structured, change, and affect the entities they connect. Sessions match theory with practical tutorials using R. Though some introductory exercises are provided, familiarity with R and introductory statistics is highly recommended.

PROFESSOR

[James Hollway](#)

ASSISTANT

Korakot Janteerasakul

IMPORTANT

Regular attendance is compulsory, and any absence must be promptly communicated to the teacher. In the event of missing more than two sessions, students are expected to provide well-documented justifications for unforeseeable circumstances (e.g. illness, accident, death of a relative), directly to the Direction of Studies. Failure to justify absences beyond two sessions will result in the assignment of code N.

Students are also reminded of the following legal rules:

The teacher owns the **copyright** on the material they created for this course. As such, any reproduction or distribution of this document, in whole or in part, as well as of any other material created by the teacher for the course, is prohibited unless permission is granted by the author.

Recording (as video or audio) a course without the consent of the teacher and other participants is strictly forbidden.

Syllabus

Course Aims

By the end of the course, you will be a discriminating consumer of network literature from across the social sciences, have a strong overview of the theories, measures and models used, and be a reasonably advanced user of network techniques to ask and answer key questions.

Course Structure

This survey course consists of two main sections. The first half of the course describes and analyses social networks, or what is called “network analysis”. The second half builds on this by exploring how we can explain network structures or other aspects of sociopolitical life and investigate relational mechanisms using networks, or what is called “network modelling”. The main lecture programme covers central concepts in the network literature and discusses how these concepts are theoretically motivated, methodologically operationalized, and applied. Various in-class exercises encourage familiarity and reflection on these concepts. Practical tutorials in R will offer hands-on opportunities to use the various concepts and measures taught (so do bring your laptops).

Course Materials

There is no required textbook for this course, however many of the books and journals contained in this syllabus also hold additional or alternative readings that may be useful for deepening your understanding of network theory and/or methods in preparation for your presentations, the exam, and/or your own research. Please approach me during my office hours if there is a particular theme or topic you would like to learn more about. For a fairly comprehensive overview of current topics, see:

- McLevey, John, John Scott, and Peter Carrington. 2023. *The SAGE Handbook of Social Network Analysis*. 2nd Edition. London: SAGE Publications.

For applications, especially of multimodal network analysis, to political networks, please see:

- Knoke, David, Mario Diani, James Hollway, and Dimitrios Christopoulos. 2021. *Multimodal Political Networks*. Cambridge: Cambridge University Press.

In terms of software, we will be using the free statistical software R. We will start from the basics, however if you are completely unfamiliar you should have a plan to make sure this is not an obstacle. Please bring your laptop with you to every session including the first, ideally with **R** and **RStudio** already installed. For general support with the practical component of the course, see:

- Kolaczyk, Eric, and Gábor Csárdi. 2014. *Statistical Analysis of Network Data with R*. New York: Springer.

The main packages used in this course are `{manynet}`, `{autograph}`, and `{migraph}`. Downloading `{migraph}` from CRAN using `install.packages("migraph", dependencies = TRUE)` will install all necessary packages.

Course Evaluation

Evaluation for the course consists of four parts:

Tutorials and Participation (20%) Students will complete the supplied tutorials and exercises and share their questions, issues, and solutions on Slack (or alternative). Since the aim here is learning, the grade will not follow *performance* in the tutorials, but *engagement* on Slack in terms of both questions and answers. A nonlinear grading scheme (e.g. your first question/comment counts more than your tenth) encourages broad participation.

Report (30%) At the end of the network analysis section, an assignment will be given that requires students to practice applying the theory and methods learned to new datasets. Datasets and further instructions will be provided when the report assignment is issued.

Post(er)s (50%) At the end of the course, students submit an executable Rmarkdown document or URL to a blog that summarises the results of analysing and modelling a relational dataset of the student's choice. You are encouraged to begin identifying a relevant dataset/research question early (in October or November). We will provide consultancy sessions to support your projects.

Course Schedule

Week 1 (17 Sep): Networks, or How to talk networks

- Lazer, David (2011). "Networks in political science: Back to the future". *PS: Political Science and Politics*, 44(01), 61–68.
- Prell, Christina (2012). "A brief history of social network analysis". In *Social network analysis: History, theory and methodology* (19–52). SAGE.
- Brandes, Ulrik, Robins, Garry, McCranie, Ann, & Wasserman, Stanley (2013). "What is network science?" *Network Science*, 1(1), 1–15.

Week 2 (24 Sep): Relations, or How to find networks

- Mische, Ann (2011). "Relational sociology, culture, and agency". In P. Carrington & J. Scott (Eds.), *The sage handbook of social network analysis* (80–97). SAGE.
- Robins, Garry (2015). "Thinking about networks: Research questions and study design". In *Doing social network research* (39–62). SAGE.
- Marsden, Peter (2005). "Recent developments in network measurement". In P. Carrington, J. Scott, & S. Wasserman (Eds.), *Models and methods in social network analysis* (8–30). Cambridge University Press.

Week 3 (1 Oct): Visualisation, or How to draw networks [Practical session with TA]

- Pfeffer, Jürgen (2017). "Visualization of political networks". In *The Oxford Handbook of Political Networks* (277–299). Oxford University Press.
- Kadushin, Charles (2012). "The psychological foundations of social networks". In *Understanding social networks: Theories, concepts, and findings* (56–73). Oxford University Press.

Week 4 (8 Oct): Structures, or How to describe topologies

- Watts, Duncan (2004). "New science of networks". *Annual Review of Sociology*, 30, 243–270.
- Rombach, Puck, Mason Porter, James Fowler, and Peter Mucha (2014). "Core-Periphery Structure in Networks." *FSIAM Journal on Applied mathematics*, 74(1), 167-190.
- Hollway, James (2022). "A framework for resilience of and in international networks." Pp. 101–14 in *A Research Agenda for Social Networks and Social Resilience*, edited by E. Lazega, T. A. B. Snijders, and R. Wittek. Cheltenham: Edward Elgar.

Week 5 (15 Oct): Community, or How to stand together

- Newman, Mark. (2012). "Communities, modules and large-scale structure in networks". *Nature Physics*, 8(1), 25–31.
- Doreian, Patrick, and Andrej Mrvar. 2019. "Signed Networks for the US Supreme Court Overturning Its Prior Decisions." *Connections* 39 (1): 1–14.
- Smith, Natalie, Paul Zivich, Leah Frerichs, James Moody, and Allison Aiello. (2020). "A Guide for Choosing Community Detection Algorithms in Social Network Studies: The Question Alignment Approach." *American Journal of Preventive Medicine* 59 (4): 597–605.

Week 6 (22 Oct): Centrality, or How to stand out

- Smith, Jason, Dan Halgin, Virginie Kidwell-Lopez, Giuseppe Labianca, Dan Brass, and Steve Borgatti (2014). "Power in politically charged networks". *Social Networks*, 36, 162–176.
- Ingold, Karin, Manuel Fischer, and Dimitris Christopoulos (2021). "The roles actors play in policy networks: Central positions in institutionalized fields". *Network Science*, 9(2), 213–235.

- Doreian, Patrick, Vladimir Batagelj, and Anuška Ferligoj. (2004). "Generalized Blockmodeling of Two-Mode Network Data." *Social Networks* 26 (1): 29–53.

Report assignment released

Week 7 (2 Nov): Report assignment due

Week 8 (5 Nov): Network Regression, or How to model homophily

- McPherson, Miller, Smith-Lovin, Lynn, and Cook, James (2001). "Birds of a feather: Homophily in social networks". *Annual Review of Sociology*, 27, 415–444.
- Robins, Garry, Lewis, Jenny, and Wang, Peng (2012). "Statistical network analysis for analyzing policy networks". *Policy Studies Journal*, 40(3), 375–401.
- Lee, In Won, Feiock, Richard, and Lee, Youngmi (2012). "Competitors and cooperators: A micro level analysis of regional economic development collaboration networks". *Public Administration Review*, 72(2), 253–262.

Week 9 (12 Nov): Network Modelling, or How to model network formation

- Amati, Viviana, Lomi, Alessandro, and Mira, Antonietta (2018). "Social network modeling". *Annual Review of Statistics and Its Application*, 5(1), 343–369.
- Koskinen, Johan, and Daraganova, Galina (2013). "Exponential random graph model fundamentals". In D. Lusher, J. Koskinen, & G. Robins (Eds.), *Exponential random graph models for social networks* (16–28). Cambridge University Press.
- Lubell, Mark, Robins, Garry, and Wang, Peng (2014). "Network structure and institutional complexity in an ecology of water management games". *Ecology and Society*, 19(4), art23.

Week 10 (19 Nov): Network Diffusion, or How to model contagion

- Andrews, Kenneth, and Biggs, Michael (2006). "The dynamics of protest diffusion: Movement organizations, social networks, and news media in the 1960 sit-ins". *American Sociological Review*, 71(5), 752–777.
- Gonzalez-Bailon, Sandra, Javier Borge-Holthoefer, Alejandro Rivero, and Yamir Moreno, (2011). "The dynamics of protest recruitment through an online network". *Scientific Reports*, 1(197), 1–7.
- Graham, Erin, Charles Shipan, and Craig Volden (2012). "The diffusion of policy diffusion research in political science". *British Journal of Political Science*, 43(3), 1–29.

Week 11 (26 Nov): Review and Overview of the Bestiary of Network Models

- Steglich, Christian E. G., Tom A. B. Snijders, and Michael Pearson (2010). "Dynamic Networks and Behavior: Separating Selection from Influence." *Sociological Methodology* 40(1), 329–93.
- Stadtfeld, Christoph, Hollway, James, and Block, Per (2017). "Dynamic network actor models: Investigating coordination ties through time". *Sociological Methodology*, 47(1), 1–40.

Week 12 (3 Dec): Consultations

Week 13 (10 Dec): Post(er)s due

Week 14 (17 Dec): Make-up session?

– This syllabus is subject to change –