RUTGERS
School of Communication and Information

Social Network Analysis

04:192:373

Spring 2025

Instructor:	Dr. Katherine Ognyanova
Email:	katya.ognyanova@rutgers.edu
Class GroupMe:	groupme.com/join_group/105089037/zvqD04JE
Online Office Hours:	Book your preferred time at ognyanova.youcanbook.me • Zoom video or audio call: bit.ly/ko-office-hours • Phone call: (609) 759-0896
Course Time:	Tuesday, 3:50pm - 6:50pm
Course Zoom:	bit.ly/network-zoom
Course Website:	rutgers.instructure.com/courses/332201

Course Format

Our *Social Network Analysis* class will use a *synchronous online format*. We will meet once a week over Zoom (zoom.rutgers.edu). At present, Zoom is available for free to all Rutgers students - follow the instructions here to register for it. The class will also have assignments that need to be completed by students on Canvas.

Course Description

Social networks are a core part of our lives. We are embedded in networks of friendship, support, and communication -- as well as in organizational, industry, and technological networks. This course explores the emergence and impact of networks, with a focus on understanding and analyzing their structure. Students will learn the fundamentals of network theory and social network analysis, gaining tools to critically evaluate social structures. The class will examine how social connections shape human behavior, success, and creativity.

Learning Objectives

Upon successful completion of this course, students should be able to:

- Apply their knowledge of network data to analyze the structure of social relations.
- Explain foundational concepts, theories, and research findings related to social network analysis.
- Critically evaluate research that uses basic network methodology.
- Apply knowledge of communication networks to solve social, organizational, and interpersonal challenges.

Contact Information

Do not hesitate to contact me if you have questions, ideas, problems, or concerns related to this course. There are a number of ways to reach me:

- **Canvas Discussion**: If you have a question about the class material or assignments, you can post it in the Discussion section on our Canvas site. Posting there can help other students who may be wondering about the same things as you.

- **E-mail**: If you have a personal question or concern, you can send it in an e-mail to katya.ognyanova@rutgers.edu. Please include "**SCI 373"** in the e-mail subject – that ensures your message will be tagged as high-priority mail and receive prompt attention.

- **GroupMe**: If you have a quick question or comment, or if you need a speedy answer from your instructors and classmates, you can use our GroupMe group to send a message. The link for joining it is groupme.com/join_group/105089037/zvqD04JE

- **Office hours:** If you want to chat with me, you can do so during office hours over Zoom. You can sign up for a meeting at ognyanova.youcanbook.me. If the times listed there do not work for you, you can e-mail to schedule an appointment. The office hours Zoom link is at bit.ly/ko-office-hours.

  You can also call by phone at (609) 759-0896. If we do not answer the phone or Zoom straight away, that means we are likely wrapping up a conversation with another student. **Please call back in 10 minutes**.

Required Readings

There is no required textbook for this class. All readings are available on the course's Canvas website (canvas.rutgers.edu). Log in using your Rutgers NetID, navigate to the course site, and browse the *Course Readings* page. The reading materials for each week of class are also listed in the *Course Outline* section of this syllabus.

If you encounter a problem with Canvas, you can contact the Rutgers Canvas help desk at help@oit.rutgers.edu or call them at 833-648-4357. Canvas support should be available 24/7.

Required Software

Throughout the class, we will use several programs and online platforms to analyze network data. All of the software and services we will use are either free or have a free version for non-commercial use.

For your work in this class, we will use:

- Polinode (www.polinode.com): online service for basic network analysis
- Gephi (www.gephi.org): software for network visualization and exploration

Optional software and online services that you can explore:

- StatnetWeb (statnet.shinyapps.io/statnetWeb): online, offers more advanced modeling
- NodeXL (www.smrfoundation.org/nodexl): network plugin for Microsoft Excel
- NetLogo (ccl.northwestern.edu/netlogo): software for network simulation models

If you are interested continuing to study more advanced network methods after this course, learning to use a programming language like R or Python can be a good next step. You are welcome to stop by my office hours to chat about resources for more advanced learning.

Course Attendance

Students are expected to attend all classes, pay attention and be active participants in the conversations we will have throughout the semester. You should read all the required materials carefully and thoroughly, identify their key points, and think about their strengths and weaknesses.

The lecture slides from each class will be available on Canvas. Note that the slides will only provide a general outline of the topics discussed in class. They do not include all the important details. You will need to pay attention in class in order to be fully prepared for assignments.

If you expect you may have to miss a class, use the Rutgers University absence reporting website (sims.rutgers.edu/ssra) to indicate the date and reason for your absence. The system will automatically send me an email. If you are unable to attend classes for longer than one week, you should contact a dean of students who can help verify your circumstances.

University policy excuses absences due to religious observance or participation and permits students to make up work missed for that reason. You should notify me at least two weeks in advance if you are unable to come to class or take an exam due to religious observance.

Course Requirements and Evaluation

Reading reflection (250 points)

Each week after you complete the required readings, you should write a brief reflection discussing one or more of them and share it with the class. The assignment should be submitted **by the end of the day on Sunday** of each week. You should use the Canvas discussion feature

to post reading reflections. If some of your classmates have shared their reading reflections before you submit yours, I encourage you to respond to the points they have made

Reading reflections should fulfill the following requirements:

- Each reading reflection should be at least **200 words** long.
- Your writing should demonstrate original thinking rather than simply provide a summary of the readings.
- Your post should include **at least one example from your own life** that connects with concepts you learned from the readings.
- Your post should conclude **with at least one thoughtful question** you have that was provoked by the readings. We will discuss those questions in class.
- Each reflection should be submitted **by the end of Sunday** before the class.

To get the full 250 points for this assignment, you need to **submit 10 reading reflections (worth 25 points each)** that show critical thinking about the theories and themes examined in this class. Posts will only contribute to the reading reflection grade if they are published on time. Late assignments will not be accepted: you have to participate throughout the semester.

Network Assignment (3 x 100 points each)

The class will have three homework assignments that will ask you to complete specific network exercises. The assignments will ask you to examine networks and analyze them using techniques we learned in class. You will get detailed instructions for each task. We will also complete examples of similar tasks in class.

Each assignment should be submitted by the deadline listed below. Late assignments will be accepted within a week of the deadline, but you will **lose 10 points** for the delay.

- Network Assignment 1: Due **Monday, February 3**
- Network Assignment 2: Due **Monday, February 17**
- Network Assignment 3: Due **Monday, March 3**

Final Project and Presentation (300 + 150 points)

Your final project can be completed individually or in groups of up to three people. Note that group projects should be more comprehensive, and each group member should contribute to part of the data collection, analysis, and writing. Group projects should include an appendix detailing each member's specific contributions.

Steps to follow for your project:

1) **Network selection**
   Find a social network you would like to examine. Here are some sources of network data that you can use:

   - Various networks from Gephi: github.com/gephi/gephi/wiki/datasets
   - Movie networks: dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/T4HBA3
   - Animal networks: networkrepository.com/asn.php

2) **Data description**
   Examine the network carefully. Find a description of the data collection – who collected it, how, and why? What are the nodes in the network? What do the links in the network represent? When was the data collected? How large is the network – how many links and nodes? What is the format of the data? How can you work with data in this format? How can you visualize the data?

3) **Research questions**
   Consider the important or interesting questions you want to explore within this network. What insights can you gain from examining it? How do the topics, readings, and theories discussed in class help you understand the network?

4) **Data analysis & visualization**
   Once you have your network, you need to examine its characteristics. What is the network size? What is the density? Who are the most important people in it? What groups and communities do they belong to? And so on.
   Make sure the data is in one of the formats we discussed in class, then analyze and visualize it using Gephi (www.gephi.org) or Polinode (www.polinode.com).

5) **Conclusions and discussion**
   Discuss what your analysis revealed. What did you learn about the network? Can you offer any recommendations for improving the network or provide insights for those involved? How do your findings support or challenge what we have learned about networks? How can future work build on and expand what you have done?

Final report requirements:

- The text of individual reports should be **1500 – 3000 words** long. Group reports should be **2500 – 5000 words long.**

- Report sections should include: (1) introduction, (2) research questions, (3) description of the data collection, analysis, and findings, and (4) conclusion and discussion.

- The submitted reports should include your **network data** and a well-designed, informative **visualization of your network**. Group reports must also provide a detailed account of each member's contributions.

- Your writing should be clear, logical, and demonstrate critical thinking with well-supported arguments. Carefully proofread your final draft to ensure it is grammatically correct and free of spelling errors.

- Reports should cite at least **5 relevant academic works**. The citations and bibliography should be formatted in APA style (one place where you can learn more about it is the Purdue Online Writing Lab). You can use a free citation manager to store and format citations (e.g. www.zotero.com), or a simpler online tool to format selected citations (e.g. www.refme.com/citation-generator/apa or www.bibme.org/apa).

Final presentation:
Prepare a 15-minute presentation of your project to deliver on the last day of class.
Presentation materials do not need to be submitted in advance.

Deadlines:

1) **March 10:** Submit a brief description of your project idea (1-2 pages)
2) **March 31:** Submit a data description (1-2 pages) and visualization.
3) **April 21**: Submit your report as a Word or PDF file on Canvas.
4) **April 22 & 29**: Present your project in class.

Late reports will be accepted until **April 28,** but the delay past the deadline will result in a **50-point deduction.**

Grade breakdown & scale

A and B grades in this class will be reserved for outstanding work. To get a high grade, students need to participate actively in class, be thorough and careful in exams and assignments, and demonstrate excellent understanding of the subject, critical thinking, and originality in their work. The grade breakdown is as follows:

Reading Reflection (x3)	**250** points
Network Assignments (x3)	**300** points
Project Proposal	**50** points
Project Data	**50** points
Project Submission	**300** points
Project Presentation	**50** points
Total:	**1000** points

The final grade will be awarded according to the following scale:

A	900-1000 points
B+	850-899 points
B	800-849 points
C+	750-799 points
C	700-749 points
D	650-699 points
F	Below 650 points

Grade appeals

You can submit appeals for individual assignment grades up to **7 days** after the grades are announced. **Appeals submitted later than that will not be accepted.**

In order to be reviewed, your appeal has to be submitted in writing over e-mail to your instructor. It should present solid arguments demonstrating that you deserve a higher grade.

If you have concerns about your course grade, schedule an appointment early during the semester to discuss it. Once the course grades are announced, they are final and will only be changed in case of an error in the computation of the student's score.

Extra credit

For each class session, students can earn **5 points of extra credit** in one of two ways:

1) **Active Participation**. Be present, pay attention, and keep your Zoom camera on throughout the class to automatically receive 5 points of extra credit. This extra credit is meant to encourage active engagement, such as participating in discussions or answering questions.
2) **Class Reflection**: If you are unable to keep your camera on, you can earn 5 points of extra credit by submitting a one-page summary that reflects on what you learned during the class. In your summary, discuss how the material connects to your personal experiences, studies, or professional aspirations. This summary must be uploaded to Canvas by midnight on Sunday of the class week.

Academic Integrity

You are required to complete your own assignments and exams, and always acknowledge the sources of contributions, materials, quotes, and ideas that you did not develop yourself. All written assignments for this course will go through plagiarism detection software that matches text against online sources, academic publications, and previous student submissions.

You should make sure that all work submitted in this class is your own and is created without the aid of impermissible technologies, materials, or collaborations. You can take advantage of AI tools such as ChatGPT to brainstorm ideas, but you cannot use those services to answer exam questions or produce written assignments. You should verify the information you receive from digital sources and summarize it in your own words.

The consequences of scholastic dishonesty in this class and at Rutgers University in general are very serious. Any violation will at a minimum result in no credit earned for the assignment in question. Serious violations of academic integrity may prevent students from completing the course or their academic program. For more details, consult the University's academic integrity policy. If you have questions about issues related to plagiarism or academic integrity, do not hesitate to contact me.

Accommodation

This course will accommodate any student in need of assistance. Students with documented disabilities who need accommodations should contact the Rutgers Disabilities Services Office (see ods.rutgers.edu for details). You can also speak with a SC&I adviser by visiting the Office of Student Services in the SC&I Building, Room 214 or calling them at 848-932-7500.

Please contact me with information about the requested assistance and present your Letter of Accommodation as early in the semester as possible.

Additional Resources

The university offers a number of resources that you can access if needed:

- For additional tutoring, training, or **writing help**, visit the Rutgers Learning Center (online at learningcenters.rutgers.edu) and the Writing Center (writingctr.rutgers.edu).
- If you need a consultation on **research materials** and ways to find them, you can contact a Rutgers University subject specialist librarian for communication.
- If you need help with **class schedule or registration**, visit the Student Services Office located in CI 214, and online at comminfo.rutgers.edu/student-services/contact-us.html.
- The SC&I IT Services can help you with various **technological problems**. You can find them in CI 120, by phone at 848-932-5555, or by email at help@comminfo.rutgers.edu.
- If you encounter a **problem with Canvas**, you can contact the Rutgers Canvas help desk at help@oit.rutgers.edu or call them at 833-648-4357.
- Student wellness services are available to you at Rutgers. You can contact CAPS for **mental health support** at rhscaps.rutgers.edu or by phone at 848-932-7884.

- The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling, and advocacy for victims of **sexual and relationship violence**. You can reach VPVA at vpva.rutgers.edu and 848-932-1181.

- The Office of Disability Services can be reached for help with accommodation and facilities for **students with disabilities** at ods.rutgers.edu, or by phone at 848-202-3111.

Course Outline

The course schedule is subject to change: materials may be added or replaced during the semester based on relevant current events, new research, and student interests. If that happens, the changes will be reflected on the Canvas website and announced in class/over email.

Date	Topics	To do before this class
1. Jan 21 (Tue)	**Introduction. What's in a network? Nodes and ties.**	Read the syllabus and check out Canvas. **Optional**: Himelboim, I. (2017). Social Network Analysis (Social Media). In *The International Encyclopedia of Communication Research Methods.*
2. Jan 28 (Tue)	**Social capital. Who are the influencers? Centrality and power.**	Uzzi, B., & Dunlap, S. (2005). How to Build Your Network. *Harvard Business Review.* Jackson, M. O. (2019). Ch.2 Power and influence: Central positions in networks. In *The Human Network: How Your Social Position Determines Your Power, Beliefs, and Behaviors*.
Feb 3 (Mon)	**Network Assignment 1 Due**	**Submit on Canvas!**
3. Feb 4 (Tue)	**Online networks. How do social ties form? Reciprocity, transitivity, homophily, popularity.**	Quan-Haase, A., Foisey, L., & McLaughlin, R. (2024). Social Media and Digital Networks. In *The Sage Handbook of Social Network Analysis.* Jackson, M. O. (2019). Ch.5 Homophily: Houses divided. In *The Human Network: How Your Social Position Determines Your Power, Beliefs, and Behaviors*.

4. Feb 11 (Tue)	**Network data collection. Are you in my book club? Ego, full, and two-mode networks.**	Newman, M. E. J. (2016). Ch.3 Social Networks. In *Networks: An Introduction*. adams, jimi, Santos, T., & Williams, V. N. (2021). Ch.7 Strategies for Collecting Social Network Data. In *The Oxford Handbook of Social Networks*.
Feb 17 (Mon)	**Network Assignment 2 Due**	**Submit on Canvas!**
5. Feb 18 (Tue)	**Structure and design. Have you seen my network? Network visualization.**	Healy, K. (2018). Ch.1 Look at Data. In *Data Visualization: A Practical Introduction*. Moody, J., & Light, R. (2021). Ch.18 Network Visualization. In *The Oxford Handbook of Social Networks.*
6. Feb 25 (Tue)	**Global network structure. It's a small world after all! Describing a network.**	Valente, T. W. (2010). Ch.8 Network-Level Measures. In *Social Networks and Health: Models, Methods, and Applications*. Borgatti, S. P., Everett, M. G., & Johnson, J. C. (2013). Ch.9 Characterizing whole networks. In *Analyzing Social Networks*.
Mar 3 (Mon)	**Network Assignment 3 Due**	**Submit on Canvas!**
7. Mar 4 (Tue)	**Dark networks. Networking for evil? Negative ties and balance.**	Ouellet, M., & Ledford, L. (2023). Crime and Networks. In J. McLevey, J. Scott, & P. J. Carrington (Eds.), *The Sage Handbook of Social Network Analysis.* Offer, S. (2021). Negative Social Ties: Prevalence and Consequences. *Annual Review of Sociology*.
Mar 10 (Mon)	**Project proposal due**	**Submit a brief project proposal (1-2p) on Canvas.**
8. Mar 11 (Tue)	**Organizational networks. What brings us together? Groups and communities.**	Shumate, M., Atouba, Y., Cooper, K. R., & Pilny, A. (2016). Interorganizational Communication. In *The International Encyclopedia of Organizational Communication.* Valente, T. W. (2010). Ch.6 Groups. In *Social Networks and Health: Models, Methods, and Applications*.
9. Mar 18 (Tue)	***SPRING BREAK***	Enjoy your spring break!

10. Mar 25 (Tue)	**Political networks. Can we talk about this? Strong and weak ties.**	Rolfe, M., & Chan, S. (2017). Voting and Political Participation. In *The Oxford Handbook of Political Networks*. Aral, S. (2016). The Future of Weak Ties. *American Journal of Sociology*
March 31 (Mon)	**Project data description due**	**Submit a data description & visualization.**
11. Apr 1 (Tue)	**Health networks. Do people change? Social influence and information spread.**	Centola, D. (2019). The Truth About Behavioral Change. *MIT Sloan Management Review*. de la Haye, K. (2023). Health Behaviours and Outcomes. In *The Sage Handbook of Social Network Analysis.*
12. Apr 8 (Tue)	**Networks of the mind. How do you see the world? Network perceptions.**	Basyouni, R., & Parkinson, C. (2022). Mapping the social landscape: Tracking patterns of interpersonal relationships. *Trends in Cognitive Sciences*. Smith, E. B., Brands, R. A., Brashears, M. E., & Kleinbaum, A. M. (2020). Social Networks and Cognition. *Annual Review of Sociology*.
13. Apr 15 (Tue)	**NO CLASS**	**Work on your final project!**
Apr 21 (Mon)	**Final project due.**	**Submit your final project on Canvas.**
14. Apr 22 (Tue)	**Project presentations**	**Present your final project in class.**
15. Apr 29 (Tue)	**Project presentations**	**Present your final project in class.**