SOSC 3720 / SOSC 5810: Introduction to Social Network Analysis

Spring 2026

Lecture Time: Tuesday 13:30 - 14:50 **Tutorial** Time: Tuesday 15:00 – 16:20

Lecture Room: LTK **Tutorial** Room: LTK

Course homepage: Canvas

Instructor

WEI, Jinlin, Room 2363, Academic Building, jinlinwei@ust.hk, Office Hour: Wednesday 15:00 – 16:00

Teaching Assistant

HO, Brian Ying Yeung, Room 2359, Academic Building, brianyyho@ust.hk. Office Hour: TBA

Course Description

This course mainly focuses on network analysis and its applications in social science. This course aims to introduce this field to senior undergraduate students and postgraduate students. Students will be expected to learn to apply basic network concepts and analytical techniques to social science phenomena and focus on specific topics that they select to solve social science questions in which they have interests. The course employs a range of assessment methods, including coding assignments and group projects, to foster both collaborative learning and personal growth.

This course consists of a lecture and a tutorial each week. The regular lecture introduces the theory and applications of different network concepts. The lecture is followed by a lab session (tutorial). This means that you will follow along on your laptop while I demonstrate how to create network visualizations or compute network statistics.

Reading materials

The reference book listed make it easier to follow the lectures.

Reference Book

1. Jeffrey C. Johnson, Filip Agneessens, Martin G. Everett, & Stephen P. Borgatti. (2022). *Analyzing Social Networks Using R* (first edition). SAGE Publications, Ltd. UK.

2. Kolaczyk, E. D., & Csárdi, G. (2020). *Statistical Analysis of Network Data with R* (2nd ed. 2020.). Springer International Publishing. https://doi.org/10.1007/978-3-030-44129-6

Intended Learning Outcomes (ILOs)

Upon finishing the course, students are expected to:

1. Understand the most common concepts used in Social Network Analysis (SNA) and explain how they apply to specific circumstances (e.g. the group of people you are interested in). Use appropriate terminology to describe connections and networks clearly.

2. Use network visualization programs to illustrate networks in ways that help you and your audience better understand them.

3. Calculate basic summary statistics describing the network, dyads (the pairs of individuals) and nodes (individuals)

4. Propose research questions that are suitable for examination using social network analysis methods.

5. Use relevant software, including R and Python, to analyze network data.

Schedule

The class schedule may be adjusted over time.

Week	Date	Topic	Events
1	Feb. 3rd	Introduction	
2	Feb. 10th	Data construction and Representation	Fix Grouping by Feb. 20th; Assignment 1 announced
3	Feb. 24th	Connectivity	Assignment 2 announced
4	March 3rd	Centrality	Assignment 1 due
5	March 10th	Clustering	
6	March 17th	Homophily	Assignment 2 due
7	March 24th	Mid-term Exam	Assignment 3 announced
8	March 31st	Small-World	Optional: Send the proposal for the final poster/paper for feedback
9	April 14th	Advanced topic: Resilience	Assignment 3 due
10	April 21st	Advanced topic: Financial Contagion	Assignment 4 announced
11	April 28th	Presentation	
12	May 5th	Advanced topic: Exponential Random Graph Models	Assignment 4 due
13	May 24th	Final Submission	

Assessment and Grading

- SOSC3720 and SOSC5810 are assessed separately. Students' final scores will be based on the following components:

i) Participation: 10%.

ii) Assignments: four assignments, total 30%.

iii) Mid-term exam: 25%. Date: March 24th.

iv) Presentation 10%. Date: April 28th.

v) Final Poster + Demo or Paper Write-up: 25%. Due date: May 24th.

1. Solo work

i. Participation in class activities

- Participation is based on involvement in lectures.
- Students are expected to keep up with course content by completing in-class exercises and participating in discussions.

ii. Mid-term exam

- Multiple-choice Questions
- The exam tests understanding of the course material, especially the methods introduced.

2. Group work

- Max group size is 2.
- Finalize group membership by February 22nd. Students who have not formed a group or chosen to work alone by that date will be randomly assigned to groups.
- Both group members will receive the same score for group assessments unless otherwise noted.

i. Assignments

- There will be 4 assignments to assess your ability to apply and evaluate basic network analysis algorithms.
- Discussion with other students is allowed, but assignments must be completed only with your group member.
- Proper usage of generative AI is allowed and encouraged. If you use AI to generate code, you must include the prompts and identify the specific AI model(s) used.

ii. Presentation

Every group needs to submit a presentation by April 28th. Some groups will present in person (a Zoom recording will be made). Others will submit a pre-recorded video presentation.

• If your group is presenting a poster, you have 10 mins for presentation and 5 mins for Q&A.

• If you are presenting a paper, you have 15 mins for presentation and 5 mins for Q&A. Follow a standard academic-talk format.

Assessment of the presentation and the final poster/paper

• Your presentations will be assessed based on the following criteria. See the Assessment Criteria provided on Canvas for more details.

• Note that the audience of presentations and the readers of posters/papers engage differently and on different time scales. Tailor your presentation to your materials to attract and retain the audience's attention.

- Attracting the audience: State the question to answer and explain why it is interesting or important.
- Literature Review (applies only to research papers): Summarize relevant work and explain your contribution.
- What is done: Describe how you collected (if applied) and analyzed the data.
- The answers: Explain the results and their implications.
- Presentation style: Clear, engaging, and easy to follow.

iii. Final poster/paper

SOSC3720 students may choose to create a poster that analyzes a "real-world" social science problem or write a research final paper. The difference between the two options lies in the intended audience: the poster is aimed at a lay audience, while the final research paper is intended for researchers. We recommend discussing your ideas with the instructor during the early weeks of the course, either in office hours or by email.

The teaching team will present a handful of different network dataset in the first few lessons available on CANVAS. If you want, you can also choose a network dataset from another source, but please discuss this with the teaching team first to make sure it is suitable.

Optional: To solicit feedback on your project idea, you may submit a proposal via Canvas by March 31st.

Poster

Focus on a real-world case and aim to communicate social-science ideas to a general audience using compelling data analysis and visualization. Examples:

- https://mdi.georgetown.edu/posters/billy-mcgloin-25-mdi-summer-2024-research-showcase-poster/
- https://www.youtube.com/watch?v=waMvm-S1PGE (includes both a poster and a presentation)
- https://michaelminn.net/tutorials/posters/2025-cracker-barrel-poster.pdf

Provide a short written report covering details that cannot be presented on the poster, including—but not limited to—the importance of your research question and the rationale for your chosen data and methods. Limit: 5 pages, 12-point font, double-spaced, including tables and figures (references excluded).UG students can choose to write a poster.

Research paper

Choose a research topic and write a research paper using network analysis data and methods. The paper should follow the standard research-article format: introduction, literature review, methods and data, results, and conclusions. Use examples from class readings and the reading list as models.

Limit the final paper to no more than 20 pages, 12-point font, double-spaced, including tables and figures (references excluded).

SOSC3720 students may choose either option. SOSC5810 students must submit a research paper.

Grading policies for the final poster/paper

- You may submit multiple drafts before the due date. We encourage submitting an initial version and revising it.
- Final submissions will be checked with plagiarism-detection software. Students must avoid plagiarism; confirmed cases may result in severe penalties, including a failing grade.

Late Submission Policy

- All assessments will have a clear deadline by which they are due. Late submissions, unless you have valid reasons supported by a doctor's note, will get partial credit, depending on lateness:
- 1) Submission within 24 hours of the deadline: a minimum of 75% of the assigned score (-2.5% every hour)
- 2) Submission between 24 and 72 hours after the deadline: a minimum of 50% of the assigned score (-2.5% every hour)
- 3) Submission more than 72 hours after the deadline: no credit

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Participation	ILO1, ILO2, ILO3	This task assesses students' understandings (ILO1) and abilities to choose figures (ILO2) and statistics (ILO3) to answer questions in social science research and in solving real-world problems using social network analysis.
Assignments	ILO1, ILO2, ILO3	This task assesses students' understandings (ILO1) and abilities to use statistical software to draw figures (ILO2) and calculate (ILO3) statistics to show network structures.
Mid-term exam	ILO1, ILO2, ILO3, ILO4	This task assesses students' understandings (ILO1) and abilities to choose appropriate figures (ILO2) and statistics (ILO3) based social network data and methods in social science research and in solving real-world problems. It also assesses students' ability to find appropriate questions that need social network analysis data and methods (ILO4).
Group Paper/ Project	ILO1, ILO2, ILO3, ILO4, ILO5	This task assesses students' understandings (ILO1) of applying social network data in social science researches in specific topics in which students have interests. It assesses their ability to propose a meaningful research question or a practical social

		problem to solve (ILO4). It assesses students' ability to collect data, conduct analyses (ILO3, 5), and display social networks clearly (ILO2).

Final Grade Descriptors

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	Demonstrates a deep understanding of fundamental concepts and methods in social network analysis. Exhibits exceptional critical thinking skills in evaluating and designing social science research using social network data, consistently applies appropriate social network analysis methods to enhance problem-solving, and produces insightful analyses. Effectively communicates complex research ideas clearly and persuasively.
B	Good Performance	Shows a solid grasp of the fundamental concepts and the application of methods in social network analysis. Demonstrates sound critical thinking skills in evaluating and designing social science research using social network data, generally applies appropriate social network analysis methods to support problem-solving, and produces accurate analyses. Clearly communicates research ideas.
C	Satisfactory Performance	Shows an adequate understanding of the fundamental concepts and the application of methods in social network analysis. Displays basic critical thinking skills in evaluating and designing social science research using social network data, applies social network analysis methods sufficiently to address problems but with limited depth or sophistication, and produces correct but sometimes shallow analyses. Communicates the basic frameworks of research ideas.
D	Marginal Pass	Possesses only basic knowledge of the fundamental concepts and the application of methods in social network analysis. Shows limited critical thinking skills in evaluating and designing social science research using social network data, applies social network analysis methods with minimal effectiveness, and produces incomplete or weak analyses. Communication of ideas is often unclear or superficial.
F	Fail	Demonstrate insufficient understanding of the fundamental concepts and the application of methods in social network analysis. Lacks critical thinking skills in evaluating and designing social science research using

		social network data and the ability to apply social network analysis methods effectively. Fails to communicate or justify analyses adequately.

Communication and Feedback

Assessment marks for individual assessed tasks will be posted on Canvas within 10 working days of submission. Feedback on assignments will include comments on strengths and areas for improvement.

Students who have further questions about the feedback including marks should consult the instructor within 5 working days after the feedback is received.

Academic Integrity

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance for academic misconduct. Please refer to Academic Integrity | HKUST -Academic Registry for the University's definition of plagiarism and ways to avoid cheating and plagiarism.