

# Logic of (Computational) Social Inquiry

771A11 / 771A12 Autumn 2022

ECTS 7.5

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Course period 22 August 2022 to 28 October 2022

Language English

## Course overview

This course is intended to introduce students to the principles of scientific inquiry, while also examining the unique features that distinguish the social sciences from other sciences. Students will learn to produce research questions, design research, and consider the micro- and macro-levels of social analysis. Special attention will be paid to computational approaches.

The course consists of lectures and seminars. All meetings are mandatory. The lectures will first address general aspects of social science research, and then go on to consider in detail four specific research methods: (i) case studies, (ii) surveys/observational data, (iii) experiments, and (iv) simulations. The final lecture will explore the cutting edge of computational social science research, along with its promises and pitfalls. The seminars will revisit the lecture materials, focusing on detailed examination of exemplary recent applications drawn from the sociological literature.

Students are strongly encouraged to contribute to a positive and active learning environment. Please ask questions during class, or let the instructor know if something is unclear or confusing. There are no stupid questions. Please show respect to your classmates when they ask questions. This is a diverse group of students from different backgrounds and what is obvious for one student may be completely new for someone else.

## Course structure

Lectures: Students are expected to have completed the assigned reading before each lecture period. During each lecture the instructor will introduce a set of concepts or a method. Four of the lectures will be led by guest instructors who are experts in their respective methods. The names and contact information for the instructors responsible for each method covered in the course are as follows:

- Case ("small N") studies: Petri Ylikoski ([petri.ylikoski@liu.se](mailto:petri.ylikoski@liu.se)).
- Observational ("large N") data: Jacob Habinek ([jacob.habinek@liu.se](mailto:jacob.habinek@liu.se)).
- Experiments: Marc Keuschnigg ([marc.keuschnigg@liu.se](mailto:marc.keuschnigg@liu.se)).
- Simulations: Selcan Mutgan ([selcan.mutgan@liu.se](mailto:selcan.mutgan@liu.se)).
- Computational social science: Etienne Ollion ([etienne.ollion@liu.se](mailto:etienne.ollion@liu.se)).

Seminars: Seminars will follow after each lecture. During the seminars students will have an opportunity to ask questions about the lectures and to discuss the assigned literature as a class and in small groups. In the case of the methods lectures, the discussion will focus on the advantages and disadvantages of each research method in order to prepare students for completing the assigned article reviews (see below for more information).

## Intended learning outcomes

Following completion of the course, students should be able to:

- Describe and examine common modes of social inquiry used within the social sciences;

- Assess the strengths and weaknesses of computational social science as compared to other approaches to social research;
- Critically evaluate and integrate knowledge gained through readings and discussions, and express this knowledge in class and in writing using the principles of source criticism;
- Identify and formulate research questions that can be answered with the tools of computational social science.

## Examination and grading

Grades range from A to F/Fx and are based on how well the student has achieved the intended learning outcomes. The learning outcomes are assessed as follows:

### Two article reviews (6 ECTS ESSx, E-A, or F/Fx)

Students must complete two short article reviews (800-1200 words). The first will be of an article assigned for one of the seminar meetings and the second will be a final article reviewed by all students. Detailed instructions will follow, but students will be expected to answer a version of Maurice Zeitlin's *The Four Questions* called *The Five Questions*. The five questions are:

1. What does the author want to know? (Or what's the work's 'question'?)
2. Why? So what? (Or what's the work's intellectual rationale?)
3. What's the author's answer or argument? (Or, what's the work's general theory and/or corresponding substantive theory?)
4. How does the author go about finding out if the answer is wrong or not? (Or, what is the author's data collection strategy and what are the key measures?)
5. How does the author probe and check whether the answer is right or not? (Or, how does the author use methods support or dismiss competing explanations of the results?)

The article reviews must be submitted through lisam by noon on the Tuesday after each method is introduced in the case of the seminar reviews, and the by noon on the last Tuesday of the course period for the final review. The due dates are:

20 Sept:	case studies.
27 Sept:	observational data.
4 Oct:	experiments.
11 Oct:	simulations.
25 Oct:	final.

Students who are not satisfied with their grade on the seminar review article will be able to complete an additional article review to replace the grade on the completed article review. If the deadlines for all the seminar article reviews have passed, the student will receive a failing grade on the assignment. There will be two re-examination opportunities after the end of the course during which students will be able to submit article reviews based on new articles chosen by the instructor.

### Six course journal entries (1.5 ECTS ASSx, E-A, or F/Fx)

Students must complete six of a possible seven "journal entries" based on questions or instructions that will be provided after each lecture. Each assignment will be relatively simple and require only a short, written response. (Sometimes only a few sentences, never more than a page.) Each journal entry will be graded on a pass/fail basis, but students will receive a combined grade on an A-F scale for the journal entries as whole.

The journal entries must be submitted through lisam by noon on the day before the next lecture. The due dates and topics for each journal entry are as follows:

1 Sept:	research questions.
6 Sept:	revised research questions.
13 Sept:	case selection.
20 Sept:	questions about case studies.

- 27 Sept: questions about observational data.
- 4 Oct: questions about experiments.
- 11 Oct: simulation questions and review.

Students who fail to complete the journal entries will be permitted to complete an additional article review to replace the journal entry component of the final grade.

### A note on plagiarism

Plagiarism will not be tolerated. Although students are encouraged to help their peers and ask their peers for help, all written assignments must be completed separately and must be the original work of the individual student. Copying directly from one another or from written sources is not permitted. All cases of suspected plagiarism will be reported immediately to the university disciplinary board. Punishments for plagiarism can be severe and may jeopardize your standing as a student in the program.

## Course literature

### Textbooks

- Martin, J. L. 2017. *Thinking through Methods: A Social Science Primer*. Chicago: University of Chicago Press.
- Salganik, M. 2018. *Bit by Bit: Social Research for the Digital Age*. Princeton: Princeton University Press. Available online at: <https://www.bitbybitbook.com/>
- Schelling, T. C. 2006. *Micromotives and Macrobehavior*. New York: W. W. Norton.

**Scientific articles and other resources:** see below for each lecture and seminar.

## Course schedule and reading assignments

All readings should be completed prior to the lecture or seminar. Some minor additional readings may be added as needed.

### Introduction and preliminaries

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Lecture (Jacob Habinek): Tuesday 30 August 10:15-12:00 (KO22).

- Martin, J. L. 2017. "Sharpen your tools." Chapter 1 in *Thinking through Methods: A Social Science Primer*. Chicago University Press.
- Salganik, M. 2018. "Introduction." Chapter 1 in *Bit by Bit: Social Research for the Digital Age*. Princeton University Press. Available online at: <https://www.bitbybitbook.com/en/1st-ed/introduction/>
- Keuschnigg, M. et al. 2017. "Analytical sociology and computational social science" *Journal of Computational Social Science* 1(1): 3–14.

### Asking a social scientific question

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Lecture (Jacob Habinek): Friday 2 September 10:15-12:00 (KO23).

Seminar (Jacob Habinek): Friday 2 September 13:15-15:00 (KO23).

- Martin, J. L. 2017. "How to formulate a research question." Chapter 2 in *Thinking through Methods: A Social Science Primer*. Chicago University Press.
- Ermakoff, I. 2017. "Shadow plays: theory's perennial challenges." *Sociological Theory* 35(2): 128-137.
- Hedström, P. & P. Ylikoski. 2010. "Causal mechanisms in the social sciences". *Annual Review of Sociology* 36: 49–67.
- Coleman, J. S. 1986. "Social theory, social research, and a theory of action." *American Journal of Sociology* 91:1309-1335.

## Answering a social scientific question

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Lecture (Jacob Habinek): Friday 9 September 10:15-12:00 (KO22).

Seminar (Jacob Habinek): Friday 9 September 13:15-15:00 (K24).

- Martin, J. L. 2017. "Choosing a site." Chapter 3 in *Thinking through Methods: A Social Science Primer*. Chicago University Press.
- Hollenbeck, J. R. 2008. "The role of editing in knowledge development: Consensus shifting and consensus creation." Chapter 2 in *Opening the Black Box of Editorship* (pp. 16-26). London: Palgrave Macmillan.
- Woodward, James. 2010. "Data, phenomena, signal, noise." *Philosophy of Science* 77(5): 792–803. Sections 1 to 5 only!
- **Practice review article:** Bail, C. A., et al. 2019. "Prestige, proximity, and prejudice: the diffusion of Google search terms across 199 countries, 2004-2014." *American Journal of Sociology* 124(5): 1496–1548.

## Case studies

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Lecture (Petri Ylikoski): Wednesday 14 September 10:15-12:00 (KO23).

Seminar (Hendrik Erz): Wednesday 21 September 13:15-15:00 (KO23).

- Collier, D. 2011. "Understanding process tracing." *PS: Political Science & Politics* 44(4): 823–30.
- Vaughan, D. 2004. "Theorizing disaster: analogy, historical ethnography, and the *Challenger* accident." *Ethnography* 5(3): 315–47.
- Ylikoski, P. 2019. "Mechanism-based theorizing and generalization from case studies." *Studies in the History and Philosophy of the Science Part A* 78: 14–22.
- **Seminar review article:** Ladegaard, I. 2020. "Open Secrecy: How Police Crackdowns and Creative Problem-Solving Brought Illegal Markets out of the Shadows." *Social Forces* 99(2): 532–559.

## Observational data

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Lecture (Jacob Habinek): Wednesday 21 September 10:15-12:00 (KO23).

Seminar (Jacob Habinek): Wednesday 28 September 13:15-15:00 (KO23).

- Breiman, L. 2001. "Statistical modeling: the two cultures." *Statistical Science* 16(3): 199–215.
- Groves, R. 2011. "Three eras of survey research." *Public Opinion Quarterly* 75(5): 861–871.
- Martin, J. L. 2017. "Dealing with documents." Chapter 8 in *Thinking through Methods: A Social Science Primer*. Chicago University Press.
- Salganik, M. 2018. "Observing behavior." Chapter 2 in *Bit by Bit: Social Research for the Digital Age*. Princeton University Press. Available online at: <https://www.bitbybitbook.com/en/1st-ed/observing-behavior/>
- **Seminar review article:** Negro, G., Kovács, B., & Carroll, G. R. 2022. "What's Next? Artists' Music after Grammy Awards." *American Sociological Review* 87(4): 644–74.

## Experiments

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Lecture (Marc Keuschnigg): Wednesday 28 September 10:15-12:00 (KO22).

Seminar (Hendrik Erz): Wednesday 5 October 13:15-15:00 (KO23).

- Shadish, W., et al. 2002. "Experiments and generalized causal inference." Chapter 1 in *Experimental and Quasiexperimental Designs for Generalized Causal Inference*. Houghton Mifflin.
- Jackson, M., & D. Cox. 2013. "The Principles of Experimental Design and Their Application in Sociology." *Annual Review of Sociology* 39:27–49.
- Salganik, M. 2018. "Running experiments." Chapter 4 in *Bit by Bit: Social Research for the Digital Age*. Princeton University Press. Available online at: <https://www.bitbybitbook.com/en/1st-ed/running-experiments/>

- Van de Rijt, A., S. Kang, M. Restivo, A. Patil. 2014. "Field Experiments of Success-Breeds-Success Dynamics." *PNAS* 111:6934–6939.
- **Seminar review article:** Van de Rijt, A. 2019. Self-Correcting Dynamics in Social Influence Processes. *American Journal of Sociology* 124(5): 1468–95.

### **Simulations**

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Lecture (Selcan Mutgan): Wednesday 5 October 10:15-12:00 (KO23).

Seminar (Hendrik Erz): Wednesday 12 October 13:15-15:00 (KO23).

- Schelling, T. C. 2006. "Micromotives and macrobehavior" and "Sorting and mixing: race and sex." Chapters 1 and 4 in *Micromotives and Macrobehavior*. W. W. Norton.
- Epstein, J. M. 1999. "Agent-based computational models and generative social science." *Complexity* 4(5): 41–60.
- Page, S. 2015. "What sociologist should know about complexity." *Annual Review of Sociology* 41: 21–41.
- Centola, D. & Macy, M. 2007. "Complex contagions and the weakness of long ties". *American Journal of Sociology* 113(3): 702–734.
- **Seminar review article:** Rossman, G. & Fisher, J. C. 2021. "Network hubs cease to be influential in the presence of low levels of advertising," *PNAS* 118(7): e2013391118.

### **Computational social science**

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Lecture (Etienne Ollion): Wednesday 19 October 10:15-12:00 (KO12).

- Lazer, D. et al. 2009. "Computational social science." *Science* 323(5915): 721–723.
- Mützel, S. 2015. "Facing big data: making sociology relevant." *Big Data & Society*, 2(2): 1–4.
- Stumpf, M. P. H., & M. A. Porter. 2012. "Critical truths about power laws." *Science* 335(6069): 665–666.
- **Final review article:** Announced 11 October 2022, due 25 October 2022.

## Summary of schedule

Week	Date		Time(s)	Location	Item	Topic
Week 35	Tuesday	30-Aug-22	10:15-12:00	KO22	Lecture	Intro
	Thursday	1-Sep-22	12:00	DEADLINE	Journal	Research q's
	Friday	2-Sep-22	10:15-12:00	KO23	Lecture	Asking q's
13:15-15:00			KO23	Seminar	Asking q's	
Week 36	Thursday	8-Sep-22	12:00	DEADLINE	Journal	Research q's
	Friday	9-Sep-22	10:15-12:00	KO22	Lecture	Answering q's
			13:15-15:00	K24	Seminar	Answering q's
Week 37	Tuesday	13-Sep-22	12:00	DEADLINE	Journal	Case selection
	Wednesday	14-Sep-22	10:15-12:00	KO23	Lecture	Case studies
Week 38	Tuesday	20-Sep-22	12:00	DEADLINE	Journal/review	Case studies
	Wednesday	21-Sep-22	10:15-12:00	KO23	Lecture	Obs. data
			13:15-15:00	KO23	Seminar	Case studies
Week 39	Tuesday	27-Sep-22	12:00	DEADLINE	Journal/review	Obs. data
	Wednesday	28-Sep-22	10:15-12:00	KO22	Lecture	Experiments
			13:15-15:00	KO23	Seminar	Obs. data
Week 40	Tuesday	4-Oct-22	12:00	DEADLINE	Journal/review	Experiments
	Wednesday	5-Oct-22	10:15-12:00	KO23	Lecture	Simulations
			13:15-15:00	KO23	Seminar	Experiments
Week 41	Tuesday	11-Oct-22	12:00	DEADLINE	Journal/review	Simulations
	Wednesday	12-Oct-22	13:15-15:00	KO23	Seminar	Simulations
Week 42	Wednesday	19-Oct-22	10:15-12:00	Zoom	Lecture	CSS
Week 43	Tuesday	25-Oct-22	12:00	DEADLINE	Final review	T.B.D.