

Ph.D. in Business Program: Information Systems

**CIS 84000 – IS SPECIAL TOPICS SEMINAR:
The Economics Artificial Intelligence (Fall 2024)**

Tentative Syllabus (subject to change)

Friday 11:30 – 2:30 pm, Room VC 13-254, Baruch College
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Course Objectives and Description

Business organizations and markets use a bewildering variety of structures and practices to coordinate economic activities. Dramatic changes in information technology, generally, and particularly in the area of artificial intelligence (AI), as well as the nature of economic competition are forcing firms to come up with new ways of designing markets, organizing work and interacting with customers. This course specifically investigates the role of AI systems to implement business processes and support business activities in organizations, platforms and markets, and also in enabling the creating of new organizational forms and strategies.

Information economics has a very active and relevant field in information systems research. This class offers an exposure to fundamental ideas in the economics of AI and the impact on firm strategy, innovation, and business performance. We will review important economic concepts and also study how economic theory has been applied in current IS research, with a particular focus on AI applications in business. As a second focus in this course, we will introduce the methodology of experimental economics in order to it to designing experiments aimed at studying the potential impact of various AI features and applications in larger business systems.

The course is designed for Ph.D students in information systems as well as other business and economics research disciplines. In class, we will typically discuss a mix of background readings, research method texts (on experimental economics), and a selection of seminal publications and current, cutting edge research articles. You are expected to be knowledgeable about these materials when you come to class so that we can spend most of the class time on the discussion of the reading materials. You will be assigned as a discussant of specific papers and textbook chapters on a rotating basis. We will also develop and run some experiments using an experimental software platform, such as, for example, z-tree, o-tree or some self-developed system.

In addition to a research paper presentation there will be one group and individual research project in the class. In a team setting, you will set up and run a replication of a previously published research study using a particular experimental software. As your term project you will propose, design, and (pilot) run your own experimental study on the impact of an AI feature or application in the context of an organizational system, which is related to a topic in your area of interest.

Required Text

Ajay Agrawal, Joshua Gans and Avi Goldfarb (AGG, eds.), *The Economics of Artificial Intelligence* Oxford Publishing, 2019.

Recommended Additional Readings (Optional)

Experimental Economics Methodology Readings:

1. Daniel Friedman and Shyam Sunder, *Experimental Methods: A Primer for Economists*, Cambridge University Press, Cambridge, MA, 1994
2. Nicolas Jaquemet and Olivier L'Haridon (JH), *Experimental Economics: Method and Applications*, Cambridge University Press, 2018.
3. Peter G. Moffat, *Experimetrics: Econometrics for Experimental Economics*, McMillian International, 2016.
4. Vernon L. Smith, *Rationality in Economics: Constructivist and Ecological Forms*, Cambridge University Press, Cambridge, MA, 2009.
5. Nicholas Bardsley et al, *Experimental Economics: Rethinking the Rules*, Princeton University Press, 2010.
6. Francesco Guala, *The Methodology of Experimental Economics*, Cambridge University Press, Cambridge, MA, 2005.

Experimental Economics Applications

7. Miller, R.M. and V. Smith, *How We Can Build Better Financial Markets*, 2005.
8. Dan Ariely, *Predictably Irrational: The Hidden Forces that Shape our Decisions*, Harper Collins, New York, NY, 2008.
9. Charles R. Plott and Vernon L. Smith (eds.), *Handbook of Experimental Economics Results*, North Holland, 2008.
10. John H. Hagel and Alvin E. Roth (eds.), *Handbook of Experimental Economics*, Volumes 1 and 2, Princeton University Press, Princeton, NJ, 1995 / 2015.
11. S. Durlauf, and L. Blume (eds.), *Behavioural and Experimental Economics*, Palgrave Macmillan, 2009.
12. Ananish Chaudhuri, *Experiments in Economics: Playing Fair with Money*, Routledge, New York, NY, 2009.
13. Jayson L. Lusk and Jason F. Shogren, *Experimental Auctions: Methods and Applications in Economic and Marketing Research*, Cambridge Univ. Press, 2007.
14. G.R. Frechette and A. Schotter (eds.), *Handbook of Experimental Economic Methodology*, Oxford University Press, 2015.

Recommended Readings on Information Economics (optional)

1. Daron Acemoglu, The Simple Macroeconomics of AI, NBER working paper 32487, May 2024. doi 10.3386/w32487
2. Soon-Yong Choi, Dale O. Stahl, and Andrew B. Whinston, *The Economics of Electronic Commerce*, McMillan Technical Publishing, Indianapolis, IN, 1997. Online version available for free download at <http://www.smartecon.com/>.
3. Hal R. Varian, Joseph Farrell, and Carl Shapiro, *The Economics of Information Technology: An Introduction*, Cambridge University Press, 2005.
4. Carl Shapiro and Hal R. Varian, *Information Rules: A Strategic Guide to the Network Economy*, Harvard Business School Press, Boston, MA, 1999.

Additional readings will be distributed in class throughout the semester.

Research Paper Presentation

Each student will be assigned specific papers/chapters from the course readings and present it in class with a particular focus on research context, research questions and research issues, and key findings and insights. The student presenter will also do a literature search to identify current research paper that are closely related to the assigned paper and summarize their key findings and how they are linked to the assigned paper. The dates of the presentations will be arranged in class.

Group Project: Replication Study

Each team will replicate an original economic experiment using a particular experimental software package to conduct the experiment. Teams need to set up the experimental software, select a published study from literature (in consultation with the instructor), design the replication experiment, recruit study participants (from the subject pool in the ISS department), run some experiments, compare the results from the replications study with the original study, and present the project in class.

Term Project: Original Study

Each student will design and (pilot) run a (small scale) original study that addresses an AI related research question in the context of an organizational system and uses the methods of experimental economics, using an experimental software system or package. You will need to choose an original research question in your own area of interest (in consultation with the instructor), design your experiment, recruit study participants (from the subject pool in the ISS department), pilot-test the experiment, and present the project and preliminary findings in class.

Grading

Class Participation	15%
Research Paper Presentations	15%
Group Project	30%
Term Project	40%

Course Outline (subject to change)

August 30: Introduction and Overview

David Brooks, The Fear of AI, New York Time, July 31, 2024.

September 6: Methodological Foundations (Economic Experiments)

Falk, A. and J.J. Heckman (2009), Lab Experiments are a major Source of Knowledge in the Social Sciences, *Science*, 326(5952), 535-538.

Gupta, A., K. Kannan, and P. Sanyal (2018), Economic Experiments in Information Systems, *MIS Quarterly*, 42(2).

Croson, R. and S. Gächter (2010), The Science of Experimental Economics, *Journal of Economic Behavior and Organization*, 73(1), 122-131.

Smith, V.L. (1994), Economics in the Lab, *The Journal of Economic Perspectives*, Vol. 8, No. 1 (Winter, 1994), pp. 113-131 (optional).

Sujoy Chakravarty, Daniel Friedman, Gautam Gupta, Neeraj Hatekar, Santanu Mitra, Shyam Sunder (2011), Experimental Economics: A Survey, *Economics and Political Weekly*, 96(35), 39-78 (optional).

Chen et al (2016) oTree – An Open-Source Platform for Laboratory, Online, and Field Experiments, *Journal of Behavioral and Experimental Finance*, Vol. 9(10), 88-97.

Fischbacher, U., z-Tree: Zurich toolbox for ready-made economic Experiments, *Experimental Economics*, (2007) 10:171–178.

September 13: AI as a GPT I

AGG, Ch. 1 and 2

September 20: AI as GPT II

AGG, Ch. 3 and 4

September 27: AI as a GPT III

AGG, Ch. 5 and 6

October 4: College Closed

October 11: College Closed

October 18: Growth, Jobs, and Inequality I

AGG, Ch, 7, 8, 9

Acemoglu, D. (2024), The Simple Macroeconomics of AI Systems, *NBER WP*.

October 25: Growth, Jobs, and Inequality II

AGG, Ch, 10, 11, 12

November 1: Growth, Jobs, and Inequality III

AGG, Ch, 13, 14, 15

November 8: Group Project Presentations

November 15: Machine Learning and Regulation I

AGG, Ch, 16, 17, 18

November 22: Machine Learning and Regulation II

AGG, Ch, 19, 20

November 27: [follows Friday Schedule]

Student Term Project Status and Progress Reports

December 6: Machine Learning and Economics

AGG, Ch. 21, 22, 23, 24

December 13: Term Project Presentations

The reading assignments and additional selected papers will be distributed in class