

Economics 490: Technology and Labor Markets

University of Illinois



Fall 2026

TuTh 132 Bevier Hall

Welcome to the course! I am Mark Borgschulte, an associate professor and labor economist here at the University of Illinois. I study labor markets, health, aging, immigration, and the causes of inequality. I grew up in Miami and San Diego, studied at Berkeley, and have been at the University of Illinois since 2014. I have three children and a dog. I hope you enjoy the course.

Course Overview

This course examines technology and labor markets through three broad questions. First, **how does technological change reshape work and labor markets?** We study how new technologies alter tasks, comparative advantage, productivity, and the demand for workers and skills. Second, **how is technological knowledge created by workers, protected by firms, and transmitted across workers, firms, and places?** We examine inventors and innovators, intangible capital, worker mobility, intellectual-property protections, noncompete agreements, trade secrets, and knowledge diffusion. Third, **what happens when firms use technology to hire, evaluate, and manage workers?** We consider algorithmic hiring, AI-assisted management, discrimination, and other ways that new technologies change employment decisions. Throughout the course, historical and contemporary evidence and modern empirical methods are used to evaluate claims about the effects of technological change.

Objectives

By successful completion of the course, the students will be able to:

- *explain* the major economic concepts and empirical findings concerning technological change and labor markets, including how firms create, organize, and protect technological knowledge and other forms of intangible capital.
- *apply* economic models and evidence from historical episodes of technological change to analyze the adoption and labor-market consequences of emerging technologies.
- *analyze* and *evaluate* claims about the effects of new technologies on workers, firms, and labor markets by assessing their economic logic, empirical evidence, and alternative explanations.

Instructor Contact Information

Email: markborg [at] illinois [dot] edu. Please use email for short communications, such as requests for additional explanation on a certain topic in the next lecture, yes/no questions, or those requiring one sentence replies. For longer questions, please come to office hours or talk to me after class.

Office Hours: Tuesdays 3:30-5pm, 31 David Kinley Hall (in suite at the south end of basement).

Course Materials

The course website will be hosted on Canvas. I will upload slides, problem sets, and other materials. I will update the course schedule on Canvas as the semester progresses.

I will ask you to download research papers and other writings. The library proxy can be used to access the readings from off-campus networks. In most cases, you should read the published version of papers from the official journal website. Where you need to read a working paper, I will share a link over Canvas.

Assignments, Exams and Grading

Assignments must be submitted (on Canvas) within 5 minutes of the start of class on the due date. Late work will be accepted for half credit if submitted before the start of the following class. I will drop your lowest score(s) on the reading assignments.

- In-class assessments (you must attend lecture to receive these points): 10 points each, 100 points total (10% of all points in course)
- 4 Empirical Assignments: 50 points each, 200 points total (20%)
- Midterm: 300 points, 300 points total (30%)
- Final: 400 points (40%)

Final grades will be based primarily on total points earned in the course. In setting letter-grade cutoffs, I may consider the overall difficulty of the assessments and evidence of improvement over the semester, particularly performance on the final examination. Students with similar overall performance will receive similar grades. I will assign the same grade to students with similar total points according to the above rubric. Students enrolled in the 4-credit version of the class should talk to me in the first week about the expectations for the additional credit hour.

In-Class Assessments

In-class assessments will focus on assigned readings, podcasts, and lecture material. I will offer approximately 12–15 assessments; only the highest 10 scores will count toward the final grade. Because several scores are dropped, there are no individual makeup assessments for ordinary absences. University-required accommodations will be honored.

Exam Policy

You must let me know by the end of the second week of class if you have a conflict with the midterm. If an emergency arises and you will miss the exam, you must contact me before the start of the exam, otherwise you will receive a score of zero on the exam. Documentation of a legitimate medical or family emergency will be required. Review the Class Attendance Policy in the Student Code of Conduct and the Dean of Student's Absence Letters requirements for details of the required documentation. Provided such documentation, I will discuss the additional work required to replace the exam in the final grade calculation. There are no makeup exams.

Please tell me as soon as possible and at least 4 weeks before the final exam if you expect to need a conflict exam. Campus policy places the conflict exam obligation on the larger of the two lectures. The University's final exam policy is here: http://studentcode.illinois.edu/article3_part2_3-201.html

What Should You Already Know?

The course assumes you have taken Economics 302: Intermediate Micro Theory and Economics 203: Economic Statistics. From your intermediate microeconomics class, I expect you to know how to solve constrained optimization problems, including setting up the consumer and firm's maximization problems, drawing indifference curves and budget constraints, and explaining substitution and income/scale effects. From your introductory statistics class, I expect you to understand point estimates, standard errors, confidence intervals, and have some exposure to linear regression.

It is also recommended that you take at least one of upper-division labor economics, industrial organization and applied econometrics before enrolling in this course.

Artificial Intelligence

All exams will be administered in class, and the use of generative artificial intelligence (AI) tools is not permitted during examinations. Homework assignments are designed to support learning and skill development. Any portions of assignments requiring AI will be clearly labeled as such.

When used appropriately and sparingly, AI tools may be helpful for checking work, organizing notes, or gaining alternative perspectives on difficult concepts. Generative AI is not, however, a substitute for critical thinking, analysis, creativity, or original work. Developing your own analytical voice and ability to communicate ideas clearly and independently is a central objective of this course and cannot be outsourced to automated tools.

Tips for Success

- Come to lecture. The posted materials are not a substitute for attendance. If you must miss a lecture, get notes from a friend.
- Complete the assigned readings and podcasts before lecture and then review again after lecture.
- Start problem sets when they are assigned, try (at least twice) to answer every question on your own before asking for help.
- Form study groups. The ability to teach the material is a good test of mastery.
- Come to office hours with questions you and your study group cannot answer on your own.
- Sleep: the research on the effects of sleep on cognition and learning is very solid. Sleep will help you learn. It will also help your mood. A single night of disrupted sleep will affect your cognitive abilities for the next week.

Campus Policies

Academic Integrity

The University has the responsibility for maintaining academic integrity so as to protect the quality of education and research on our campus and to protect those who depend upon our integrity.

Expectations of Students. It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions. Students have been given notice of this art by virtue of its publication. Regardless of whether a student has actually read this Part, a student is charged with knowledge of it. Ignorance is not a defense.

The University's full academic integrity policy is available at:
http://studentcode.illinois.edu/article1_part4_1-401.html

Disability Resources

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 217-333-1970, e-mail disability@illinois.edu or go to the DRES website.

Anti-Racism and Inclusivity Statement

The University of Illinois is committed to the creation of an anti-racist, inclusive community that welcomes diversity along a number of dimensions, including, but not limited to, race, ethnicity and national origins, gender and gender identity, sexuality, disability status, class, age, or religious beliefs. The College recognizes that we are learning together in the midst of the Black Lives Matter movement, that Black, Hispanic, and Indigenous voices and contributions have largely either been excluded from, or not recognized in, science and engineering, and that both overt racism and micro-aggressions threaten the well-being of our students and our university community.

The effectiveness of this course is dependent upon each of us to create a safe and encouraging learning environment that allows for the open exchange of ideas while also ensuring equitable opportunities and respect for all of us. Everyone is expected to help establish and maintain an environment where students, staff, and faculty can contribute without fear of personal ridicule, or intolerant or offensive language. If you witness or experience racism, discrimination, micro-aggressions, or other offensive behavior, you are encouraged to bring this to the attention of the course director if you feel comfortable. You can also report these behaviors to the Bias Assessment and Response Team (BART) <https://bart.illinois.edu/>. Based on your report, BART members will follow up and reach out to students to make sure they have the support they need to be healthy and safe. If the reported behavior also violates university policy, staff in the Office for Student Conflict Resolution may respond as well and will take appropriate action.

Community of Care

As members of the Illinois community, we each have a responsibility to express care and concern for one another. If you come across a classmate whose behavior concerns you, whether in regards to their well-being or yours, we encourage you to refer this behavior to the Student Assistance Center (217-333-0050 or <http://odos.illinois.edu/community-of-care/referral/>). Based on your report, the staff in the Student Assistance Center reaches out to students to make sure they have the support they need to be healthy and safe.

Further, we understand the impact that struggles with mental health can have on your experience at Illinois. Significant stress, strained relationships, anxiety, excessive worry, alcohol/drug problems, a loss of motivation, or problems with eating and/or sleeping can all interfere with optimal academic performance. We encourage all students to reach out to talk with someone, and we want to make sure you are aware that you can access mental health support at McKinley Health Center (<https://mckinley.illinois.edu/>). Or the Counseling Center (<https://counselingcenter.illinois.edu/>). For urgent matters during business hours, no appointment is needed to contact the Counseling Center. For mental health emergencies, you can call 911.

Sexual Misconduct Reporting Obligation

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX and Disability Office. In turn, an individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: <http://wecare.illinois.edu/resources/students/#confidential>.

Other information about resources and reporting is available here: <http://wecare.illinois.edu>.

Mental Health

Significant stress, mood changes, excessive worry, substance/alcohol misuse or interferences in eating or sleep can have an impact on academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings which are covered through the Student Health Fee. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do for yourself and for those who care about you.

Counseling Center (217) 333-3704

McKinley Health Center (217) 333-2700

National Suicide Prevention Lifeline (800) 273-8255

Rosecrance Crisis Line (217) 359-4141 (available 24/7, 365 days a year)

If you are in immediate danger, call 911

*The above statement is approved by the University of Illinois Counseling Center.

Emergency Response Recommendations

Emergency response recommendations can be found at the following website:

<http://police.illinois.edu/emergency-preparedness/>

I encourage you to review this website and the campus building floor plans website within the first 10 days of class:

<http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/>

Economics 490: Technology and Labor Fall 2026 Schedule Grid

Details of lectures and assignments may be adjusted by announcement on Canvas.

Week/Date	Tuesday Lecture, Readings	Thursday Lecture, Readings
Week 1 Aug 25, 27	First Day of Class: Overview, Syllabus, Intro	Start Slides: Technology Overview
Week 2 Sept 1, 3	Start Slides: Empirical Methods: How do we know what technology is doing? Andrew Caplin, David J. Deming, Shangwen Li, Daniel J. Martin, Philip Marx, Ben Weidmann, and Kadachi Jiada Ye, "The ABC's of Who Benefits from Working with AI: Ability, Beliefs, and Calibration," NBER Working Paper 33021 (2024).	Podcasts (watch both short videos): "Difference in Differences," The Effect, Videos on Causality, Ep 51; "Parallel Trends," The Effect, Videos on Causality, Ep 52.
Week 3 Sept 8, 10	Anders Akerman, Ingvil Gaarder, Magne Mogstad, The Skill Complementarity of Broadband Internet, <i>The Quarterly Journal of Economics</i>, Volume 130, Issue 4, November 2015, Pages 1781–1824.	Start Slides: Comparative Advantage and Task-based Models of the Labor Market Podcast: The Context Window with David Deming. "AI Will Beat You at Everything. You'll Still Have a Job." July 2026.
Week 4 Sept 15, 17	PROBLEM SET 1 DUE	Start Slides: Technology in Historical Perspective Brynjolfsson, Erik, Bharat Chandar, and Ruyu Chen. "Canaries in the Coal Mine? Six Facts about the Recent Employment Effects of Artificial Intelligence." Revised August 2026.
Week 5 Sept 22, 24	James Feigenbaum, Daniel P Gross, Answering the Call of Automation: How the Labor Market Adjusted to Mechanizing Telephone Operation, <i>The Quarterly Journal of Economics</i>, Volume 139, Issue 3, August 2024, Pages 1879–1939.	Podcast: AI and Our Time at Work: Featuring MIT Neil Thompson and David Autor, MIT CSAIL Alliances and MIT Museum, January 2026.
Week 6 Sept 29, Oct 1	Start Slides: Structural Change Autor, David, Caroline Chin, Anna Salomons, and Bryan Seegmiller. "New frontiers: The origins and content of new work, 1940–2018." <i>The Quarterly Journal of Economics</i> 139, no. 3 (2024): 1399-1465.	PROBLEM SET 2 DUE

Week/Date	Tuesday Lecture, Readings	Thursday Lecture, Readings
Week 7 Oct 6, 8	Johnston, Andrew C. and Makridis, Christos A., AI, Output, and Employment (March 23, 2026).	Part I Synthesis Practice Midterm Solved in Class
Week 8 Oct 13, 15	Midterm	Start Slides: Workers Who Create Technology

Post Midterm Schedule (assignments and readings to be announced later):

Week 9 Oct. 20, 22 **Innovators, Human Capital, and Compensation**

Week 10 Oct. 27, 29 **Worker and Inventor Mobility; Knowledge Spillovers**

Week 11 Nov. 3, 5 **Noncompete Agreements, Trade Secrets, and Intangible Capital**

Week 12 Nov. 10, 12 **Immigration, Skills, and Innovation**

Week 13 Nov. 17, 19 **Technology in Hiring and Discrimination**

— Nov. 21–29 **Fall Break — No Class**

Week 14 Dec. 1, 3 **Worker Evaluation, Monitoring, and AI-Assisted Management**

Week 15 Dec. 8 **AI and the Future of Work; Course Synthesis and Final Review**