

# Metrics for the Future of Work in the Digital Era

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## Course Description

Welcome to *Metrics for the Future Work*. This course is designed to help you understand how work has been measured historically, how it is measured today, and what new approaches may be needed in the evolving AI landscape. We will unpack the assumptions behind these metrics and consider the implications of using them to measure human work for individuals, business performance, and society at large.

A central focus will be on quantitative measures such as automation, augmentation, and exposure to AI, along with new approaches that capture the impact of emerging information technologies on labor and firms. We will draw on concepts from economics, organizational sciences, computational social science, and network analysis, providing exposure to analytical frameworks and data-driven techniques for studying the present and future of work. While some background in these areas may help you get the most out of the course, it is not required to succeed.

Beyond measurement, we will consider the design of human-centric metrics and technologies that not only track but also shape how AI is deployed in organizations.

The goal of this course is to equip you with the conceptual and methodological tools to critically evaluate claims about AI and work substitution, identify overstated promises, and uncover opportunities for deploying AI in ways that enhance both organizational effectiveness and human outcomes. The course will also help you build foundational skills useful for future coursework on information management, technology deployment in organizations, and network analysis.

Technology skills are not required, although a background in information technology management, econometrics, statistics, or computational social science will be helpful.

I look forward to working with you and building a human-centric view of work together this semester!

**Prerequisites/Corequisites:** Prior exposure to basic statistics, econometrics and mathematics is helpful but not required.

## Learning Goals

After this course, you will be able to:

1. Define and distinguish the concepts of productivity, automation, augmentation, and exposure and their relevance for measuring technology's impact on firms and workers.
2. Explain the relationships between tasks, jobs, occupations, and skills, and how they can be used for workforce design.
3. Evaluate existing metrics of human work, their strengths, weaknesses and their applicability for informing managerial, operational, and strategic organizational goals.
4. Evaluate different approaches of technology deployment and their effects on firm productivity and performance.
5. Apply fundamental statistical and network analysis techniques to quantify workforce performance in relation to technology adoption and organizational outcomes.
6. Identify opportunities for developing new, human-centric metrics that capture work and firm performance in the context of emerging information technologies.

## Evaluation and Grading

30% Class Participation

40% Reading Reports

30% Final Project

## Course Calendar

### Unit 1: Technology and Labor

#### Class 1: Historical Approaches to Measuring Work

1. Hillier, F. S., & Lieberman, G. J. (2015). Introduction to operations research. McGraw-Hill, Chapter 1: Introduction.

##### Optional Readings:

- Braverman, H. (1998). Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century. Chapter 2: The Origins of Management, Chapter 3: The Division of Labor, Chapter 4: Scientific Management. Available: [https://caringlabor.wordpress.com/wp-content/uploads/2010/11/8755-labor\\_and\\_monopoly\\_capitalism.pdf](https://caringlabor.wordpress.com/wp-content/uploads/2010/11/8755-labor_and_monopoly_capitalism.pdf)

#### Class 2: The task-model of work: Tasks, Jobs and Occupations

1. Acemoglu, D., & Autor, D. (2011). Skills, tasks and technologies: Implications for employment and earnings. In *Handbook of labor economics* (Vol. 4, pp. 1043-1171). Elsevier.
2. Jesuthasan, R., & Boudreau, J. (2021). Work without jobs. *MIT Sloan Management Review*, 62(3), 1-5.

#### Optional Readings:

- Deloitte. (n.d.). Developing new work models. *Deloitte Insights*. Retrieved from <https://www.deloitte.com/us/en/insights/topics/talent/new-work-models.html>
- Peterson, N. G., & Bownas, D. A. (2014). Skill, Task Structure, and Performance Acquisition. In *Human performance and productivity* (pp. 49-105). Psychology Press.
- <https://www.onetonline.org/>

### Class 3: Theories of Technology & Work

1. Orlikowski, W. J. (1992). The duality of technology: Rethinking the concept of technology in organizations. *Organization science*, 3(3), 398-427.

#### Optional Readings:

- For the econ enthusiasts: Stiglitz, Joseph E. "The contributions of the economics of information to twentieth century economics." *The quarterly journal of economics* 115, no. 4 (2000): 1441-1478.

## Unit 2: Metrics and Methods

### Class 4: Metrics Design & Pitfalls

1. This podcast with Roberto Rigobon: <https://podcast.wtca.org/podcast/09-measurement-social-well-being-and-a-way-forward-with-roberto-rigobon/>
2. Thomas, R. L. (2022). *Reliance on Metrics Is a Fundamental Challenge for AI*. PMC.

#### Optional Readings:

- Rahwan, I. et al. (2019). *Machine behaviour*. *Nature* 568, 477–486.

### Class 5: Organizational Metrics

1. Neely, A., Gregory, M., & Platts, K. (1995). *Performance measurement system design: A literature review and research agenda*. *International Journal of Operations & Production Management*, 15(4), 80–116.
2. Chew, B. (1988) *No-nonsense Guide to Measuring Productivity*. <https://hbr.org/1988/01/no-nonsense-guide-to-measuring-productivity>
3. Brynjolfsson, Erik, Daniel Rock, and Chad Syverson (2018). "Artificial intelligence and the modern productivity paradox: A clash of expectations and statistics." In *The economics of artificial intelligence: An agenda*, pp. 23-57. University of Chicago Press.

### Class 6: Networks Metrics in Organizations

1. Krackhardt, D. (1992). The Strength of Strong Ties: The Importance of Philos in Organizations.
2. Hanneman, R. A., & Riddle, M. (2005). *Introduction to social network methods*. Chapter 3.

3. **Borgatti, S. P., Everett, M. G., & Johnson, J. C. (2018).** *Analyzing Social Networks*. Chapters on centrality and cohesion.

**Optional Readings:**

- **Benzell, Seth, and Avinash Collis.** "How to Govern Facebook: A Structural Model for Taxing and Regulating Big Tech." Available at SSRN 3619535 (2020).
- **Easley, D., & Kleinberg, J. (2010).** *Networks, crowds, and markets: Reasoning about a highly connected world* (Vol. 1). Cambridge: Cambridge university press.

## **Unit 3: Automation, Augmentation, Exposure and Beyond**

### **Class 7: Computarization and Automation**

1. **Frey, C. B., & Osborne, M. A. (2017).** The future of employment: How susceptible are jobs to computerisation?. *Technological forecasting and social change*, 114, 254-280.
2. **Acemoglu, Daron, and Pascual Restrepo (2018).** *The race between man and machine: Implications of technology for growth, factor shares, and employment*. American Economic Review 108, no. 6: 1488-1542.
3. **Brynjolfsson, E., Rock, D. and Syverson, C.(2021)** *The productivity J-curve: How intangibles complement general purpose technologies*. American Economic Journal: Macroeconomics 13, no. 1: 333-72.

**Optional Readings:**

- **Brynjolfsson, E, and McAfee, A. (2017).** "The business of artificial intelligence." Harvard Business Review: 1-20.

### **Class 8: AI 'Exposure' and Augmentation vs Automation**

1. **Eloundou, T., Manning, S., Mishkin, P., & Rock, D. (2024).** GPTs are GPTs: Labor market impact potential of LLMs. *Science*, 384(6702), 1306-1308.
2. **Autor, D. H., Levy, F., & Murnane, R. J. (2003).** *The Skill Content of Recent Technological Change*. Quarterly Journal of Economics, 118(4), 1279–1333.

### **Class 9: Beyond machine-centric metrics**

1. **Loaiza, I., & Rigobon, R. (2024).** The EPOCH of AI: Human-Machine Complementarities at Work. Available at SSRN 5028371.

### **Class 10: Digital work, Platforms and Algorithmic Management**

1. **Calacci, D. (2023).** Building dreams beyond labor: Worker autonomy in the age of AI. *Interactions*, 30(6), 48-51.
2. **Lee, M. K., Kusbit, D., Metsky, E., & Dabbish, L. (2015).** *Working with machines: The impact of algorithmic and data-driven management on human workers*. CHI Conference on Human Factors in Computing Systems, 1603–1612.

3. **Rosenblat, A., & Stark, L. (2016).** *Algorithmic labor and information asymmetries: A case study of Uber's drivers*. *International Journal of Communication*, 10, 3758–3784.

## **Class 11: Metrics Workshop**

### **Unit 4: Managerial and Societal Implications of AI for work**

## **Class 12: Guest Speaker**

## **Class 13 The Future of Work in the Age of AI**

1. **Autor, D. (2015).** "Why are there still so many jobs? The history and future of workplace automation." *Journal of economic perspectives* 29, no. 3: 3-30.
2. **Deming, D. (2017 )**"The growing importance of social skills in the labor market." *The Quarterly Journal of Economics* 132, no. 4: 1593-1640.

## **Class 14: AI, Inequality and Ethics**

1. **Loaiza, I., & Rigobon, R. (2025).** *From Wealth to Welfare: Systemic Complementarities for the Age of AI*. Available at SSRN 5336330.

## **Academic integrity statement**

In this course, I will hold you to the high standard of academic integrity expected of all students at the Institute. I do this for two reasons. First, it is essential to the learning process that you are the one doing the work. I have structured the assignments in this course to enable you to gain a mastery of the course material. Failing to do the work yourself will result in a lesser understanding of the content, and therefore a less meaningful education for you. Second, it is important that there be a level playing field for all students in this course and at the Institute so that the rigor and integrity of the Institute's educational program is maintained.

Violating the [Academic Integrity policy](#) in any way (e.g., plagiarism, unauthorized collaboration, cheating, etc.) will result in official Institute sanction. Possible sanctions include receiving a failing grade on the assignment or exam, being assigned a failing grade in the course, having a formal notation of disciplinary action placed on your MIT record, suspension from the Institute, and expulsion from the Institute for very serious cases.

Please review the [Academic Integrity policy](#) and related resources (e.g., working under pressure; how to paraphrase, summarize, and quote; etc.) and contact me if you have any questions about appropriate citation methods, the degree of collaboration that is permitted, or anything else related to the Academic Integrity of this course.

## **Special Accommodations and Disability Support Services**

If you need disability-related accommodations, I encourage you to meet with me early in the semester. If you have not yet been approved for accommodations, please contact [Student Disability Services](#) at [sds-all@mit.edu](mailto:sds-all@mit.edu).