

IE 494 Industry Analysis
Spring 2026

Instructor: Ercan Erkul

Teaching

Assistant:

Course content:

Macroeconomic framework of industrial activity. Key macro indicators. Classification schemes for economic activity. Long-term trends in major manufacturing, service and creative industries. Surveys and censuses for industrial activity. Key industry indicators. Sources for monitoring developments in industries. Industry 4.0 and 5.0. Analysis of selected industries. Brief remarks on the future of industry. Impact of AI.

Prerequisite: None

Course Topics:

Weeks	Topics
1	Introduction to industry analysis: from macro to meso economics
2	Classification of economic activities.
3	Sources of industrial information.
4	The past: From Industry 1.0 to 4.0
5	The present: Digital and physical AI
6	Case study: Manufacturing: AI chips (GPUs, TPUs etc)
7	Case study: Manufacturing: defence industries
8	Case study: Services: servitization and deservitization
9	Case study: Services: health care
10	Case study: Creative industries: video games
11	Case study: Creative industries: cinema & TV
12	Case study: Creative industries: publishing
13	The future: From Industry 4.0 to 5.0
14	The role of industrial engineers in the 21st century

Textbooks:

Quiggin, J. 2021. *Economics in Two Lessons: Why Markets Work So Well, and Why They Can Fail So Badly*. Princeton University Press

Kennedy, P. E, 2017. *Macroeconomic Essentials: Understanding Economics in the News*, MIT Press

References:

Nousal, S. et al. 2024. *Industry 4.0 to Industry 5.0: Explorations in the Transition from a Techno-economic to a Socio-technical Future*. Springer

Annarelli, A. 2019. *The Road to Servitization : How Product Service Systems Can Disrupt Companies' Business Models*. Springer

Jones, C., et al. 2015. *The Oxford Handbook of Creative Industries*. Oxford University Press.

Karwowski, W. et al. 2025. *Advances in Artificial Intelligence Applications in Industrial and Systems Engineering*. Wiley

Kumar, K. 2024. *Advances in Industrial Engineering in the Industry 4.0 Era*. CRC Press

Grading:

Case Studies	20%
In-Class Work	10%
Project	20%
Midterm	20%
Final	30%

Course objectives and learning outcomes: At the end of the course, the students will

1. learn macroeconomic essentials within an industry-oriented framework.
2. understand key macro indicators and their relationship to industrial activity.
3. understand how the government impacts upon industrial activity through policies and regulations.
4. learn classification schemes of industrial activity.
5. learn long-term trends in major manufacturing, service and creative industries.
6. learn key production, employment and productivity indicators for the manufacturing industry. 7
7. learn about major industry information sources such as magazines, trade publications and newspapers.
8. conduct analysis of selected industries.
9. understand broadly the historical evolution and probable future developments in industrial activity, including impact of AI