COURSE OUTLINE

Course Code / Title : HE3135 Introduction to Digital Economics

Pre-requisites : HE3001 Microeconomics III and HE3002 Macroeconomics III

No. of AUs. : 3

Contact Hours : 39

Course Aims

The digital revolution has profoundly transformed the global economy. Digital technologies are reshaping business models, creating new varieties of goods and services, and emphasizing the importance of intangible assets. Understanding today's world requires a deep engagement with the changes brough about by the digital economy.

This course aims to provide an in-depth exploration of the critical topics and emerging phenomena in the digital economy. Students will gain insight into both the macroeconomic and microeconomic implications of digital technologies, blending theoretical economic principles with real-world case studies. The course addresses key issues such as fintech, big data, privacy, and artificial intelligence, preparing students to navigate and contribute to the evolving digital landscape.

Intended Learning Outcomes (ILO)

Upon the successful completion of this course, students would be able to:

1. Understand how digital technologies influence business performance at the firm level
2. Analyze the macroeconomic impacts of digitization on economic growth and productivity
3. Explore the challenges and opportunities presented by fintech, big data and artificial intelligence

Course Content

Theme 1: Understanding the micro-implication of digital technologies

- Digital technologies and firm performance
  - The history of digital technologies
  - Digital technologies change the costs and modes of production
  - The impact of digital technologies on firm performance

- Competition strategies in the digital era
  - Understand how should firms use pricing, long-tail, new product strategies to compete in the digital era
- Rise of platform economy
  - What is platform? Why platform is different from other organizational types and why do platforms become dominant in the digital era?
- Labor market implications of digital technologies

Theme 2: Understanding the macro-implications of digital technologies on economic growth and measurement

- Innovation and entrepreneurship in digital economy
  - How digitization reshapes ventures and entrepreneurship, and its impact on the economy in general
- Rise of intangible capital in digital era
- Measuring welfare and output in the digital economy
  - Discuss the modern productivity paradox of digital technologies and several explanations of it

Theme 3: Understanding key issues and developments on big data and privacy, fintech, and artificial intelligence

- Big data and privacy
  - What is unique about data as the production input?
  - The value and risks of data usage; Data governance
- Fintech
  - How digital technologies change financial industry: from payment to lending
- Artificial intelligence
  - The economics of artificial intelligence
  - The impact of AI on labor market

Course Assessment

Class Participation	: 10%
Presentation	: 25%
Test / Quiz	: 15%
Final Examination	: 50%
Total	**--------**
	100%

Reading and References

The reading materials listed here should only be used for guidelines. More materials from other sources in the lecture notes will be included in the lecture notes.

(Z)verby, H., & Audestad, J. A. (2021). Introduction to digital economics: Foundations, business models and case studies. Springer Nature.

Ellison, Glenn, and Sara Fisher Ellison (2005). Lessons About Markets from the Internet. Journal of Economic Perspectives, 19 (2): 139-158.

Goldfarb, A., Greenstein, S. M., & Tucker, C. E. (Eds.). (2015). Economic analysis of the digital economy. University of Chicago Press.

Goldfarb, A., & Tucker, C. (2019). Digital economics. Journal of economic literature, 57(1), 3-43.

Brynjolfsson, E., Rock, D., & Syverson, C. (January, 2021). "The productivity J-curve: How intangibles complement general purpose technologies" American Economic Journal: Macroeconomics, 13(1), 333-72, DOI: 10.1257 /mac.20180386.

Colin J. Hottman, Stephen J. Redding, David E. Weinstein, Quantifying the Sources of Firm Heterogeneity, The Quarterly Journal of Economics, Volume 131, Issue 3, August 2016, Pages 1291-
1364, https://doi.org/10.1093/qje/qjw012

Erik Brynjolfsson, Long Chen & Xijie Gao, "Gains from Product Variety: Evidence from a Large Digital Platform" NBER WP 30802, December 2022

Bai, J., Chen, M. X., Liu, J., Mu, X., and Xu, D. Y. (2022a). Stand Out from the Millions: Market Congestion and Information Friction on Global E-commerce Platforms. Unpub. Paper

Babina, T., Fedyk, A., He, A., & Hodson, J. (2024). Artificial intelligence, firm growth, and product innovation. Journal of Financial Economics, 151, 103745.

Korinek, A. (2023). Generative Al for economic research: Use cases and implications for economists. Journal of Economic Literature, 61(4), 1281-1317.

Acemoglu, D., & Restrepo, P. (2020). Robots and jobs: Evidence from US labor markets. Journal of political economy, 128(6), 2188-2244.

Agrawal, A., Gans, J. S., & Goldfarb, A. (2019). Artificial intelligence: the ambiguous labor market impact of automating prediction. Journal of Economic Perspectives, 33(2), 31-50.

Castillo, J.C., Knoepfle, D. T., & Weyl, E.G. (2023). Matching and pricing in ride hailing: Wild goose chases and how to solve them. Available at SSRN 2890666.

Tianshu Sun, Zhe Yuan, Chunxiao Li, Kaifu Zhang, Jun Xu (2023) The Value of Personal Data in Internet Commerce: A High-Stake Field Experiment on Data Regulation Policy, Forthcoming, Management Science

Bian, W., Cong, L. W., & Ji, Y. (2023). The Rise of E-Wallets and Buy-Now-Pay-Later: Payment Competition, Credit Expansion, and Consumer Behavior (No. w31202). National Bureau of Economic Research.

NOTE: The above listing comprises the foundational readings for the course and more up-to-date relevant readings will be provided when they become available.

Course Instructors

Instructor	Office Location	Email
Gao Xijie		xijie.gao@ntu.edu.sg

Planned Weekly Schedule

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
1	Introduction to Digital Economics	1,2,3	Lecture notes	In-person	NA
2	Digital Technologies and Firm Performance	1,2,3,	Lecture notes	In-person	NA
3	Competition Strategies in the Digital Era	1,2,3	Lecture notes	In-person	NA
4	Labor Market Implications of Digital Technologies	1,2,3	Lecture notes	In-person	NA

5	Rise of Platform Economy	1,2,3	Lecture notes	In-person	NA
6	Innovation and Entrepreneurship in Digital Era	1,2,3	Lecture notes	In-person	NA
7	Rise of Intangible Capital in the Digital Era	1,2,3	Lecture notes	In-person	NA
8	Understanding and Explaining the Productivity Paradox	1,2,3	Lecture notes	In-person	NA
9	Data Economics	1,2,3	Lecture notes	In-person	NA
10	The Development of Fintech and Challenges	1,2,3	Lecture notes	In-person	NA
11	Economics of Artificial Intelligence	1,2,3	Lecture notes	In-person	NA
12	Digitization in the Industry	1,2,3	Lecture notes	In-person	NA
13	Final Thoughts and Conclusion	1,2,3	Lecture notes	In-person	NA