Economic Issues A

Module Code: ECU22041

Module Title: Economic Issues A – Economics of Innovation: Data and AI

- **ECTS Weighting**: 5
- **Semester/Term Taught**: Semester 1
- **Contact Hours**: 22 academic hours of lectures 4h of tutorials
- **Module Personnel**: Lecturer – Dr Madina Kurmangaliyeva (kurmangm@tcd.ie).

Module Learning Aims

This module aims to:

- Provide an introduction into the economics of innovation.
- Examine the latest examples of innovative technologies, in particular, digital technologies and artificial intelligence (AI), thinking as economists and using economic models.
- Offer an overview of frontier research in economics (both theoretical and empirical) on the impact of data and AI on the broader economy

Module Learning Outcomes

Upon successful completion of this module, you will be able to:

- Explain fundamental concepts and economic theories related to innovation, including its role in economic growth, public policy, and intellectual property.
- Analyse the economic impact of recent advancements in digital technologies and artificial intelligence.
- Critically evaluate empirical and theoretical research concerning the effects of datafication and AI on productivity, labour markets, inequality, and overall welfare.

- Assess existing and proposed policy interventions addressing the opportunities and challenges posed by digitization, datafication, and AI in the modern economy.

Module Content

This module consists of two parts and it is likely to include the following topics (as time permits):

Part 1. Economics of Innovation:

- The Nature and Importance of Innovation
- Innovation, Market Failures, and Public Policy
- The Basics of Intellectual Property Rights
- The Measurement of Innovation, Productivity, and Growth

Part 2. Economics of Data and AI:

- Digitization, Datafication, and AI: Overview for Economists
- Data-driven Markets
    - Network Effects and Competition
    - Case study: Big data and search engines
- Automation and prediction at work:
    - Human Decisions versus Machine Prediction
    - Human Decisions with Machine Prediction
    - Case studies: Algorithmic Risk Assessment Tools for Criminal Justice
- Macroeconomics of AI and Automation:
    - Task-based model of economy + AI technology
    - Effects of AI on production, wages, inequality
- Discussion: Sources of positive and negative welfare effects of datafication and AI; Proposed policy interventions

Recommended Reading List

The following texts are useful for different parts of the course:

- Greenhalgh, Christine, and Mark Rogers. "Innovation, intellectual property, and economic growth." Innovation, intellectual property, and economic growth. Princeton University Press, 2010. Key chapters will be made available on Blackboard.
- Agrawal, Ajay, Joshua S. Gans, and Avi Goldfarb. "Exploring the impact of artificial intelligence: Prediction versus judgment." Information Economics and Policy 47 (2019). https://www.sciencedirect.com/science/article/pii/S0167624518301136
- Kleinberg, Jon, et al. "Human decisions and machine predictions." The quarterly journal of economics 133.1 (2018). https://academic.oup.com/qje/article-abstract/133/1/237/4095198
- Acemoglu, Daron. "The simple macroeconomics of AI." Economic Policy 40.121 (2025). https://economics.mit.edu/sites/default/files/2024-04/The%20Simple%20Macroeconomics%20of%20AI.pdf

Other references will be provided, as relevant, for particular topics.

Module Pre-Requisite

No specific module is a formal prerequisite for this module. However, it is expected that students have a basic understanding of general economic concepts and probability theory. Students who have not previously completed (1) an Introduction to Economics and/or (2) Mathematics and Statistics modules (such as ECU11011/ECU11012/ECU11022/ECU11024 at Trinity) are encouraged to review appropriate introductory material.

Assessment Details

Precise assessment information, including timing, will be provided at the start of the module. Assessment is broadly allocated as follows:

- Quizzes: 30% - Two online quizzes/tests (15% each of the overall grade);
- Final exam: 70% of the overall grade.

Module Website
Blackboard.