

1. Overview of “Technology and Innovation”

1.1. Logistics

- Lectures and tutorials
 - 12 lecture weeks (Thursday, AS6 0212)
 - 8 tutorial weeks
 - First tutorial week as late as possible

1.1. Logistics

- Requirements: Extensive reading
 - Freeman, C. and Luc Soete (1997), *The Economics of Industrial Innovation*
 - Dosi, G. et al (eds.) (1988), *Technical Change and Economic Theory*
 - Fargerberg, J. et al. (2005) *The Oxford Handbook of Innovation*
 - Rosenberg, N. (1982), *Inside the Blackbox*
 - Shin, Jang-Sup (1996), *The Economics of the Latecomers*
- * Reading list will be provided by lectures & tutorials

1.1. Logistics

- Requirements: Thinking capability
 - No textbook answers
 - Critical understanding of conventional explanations
 - Form your own views on major issues

1.1. Logistics

■ Interdisciplinary approach

- Broaden your horizon beyond economics
- Be cautious not falling into economic determinism, economics imperialism ...

1.1. Logistics

■ Assessment

- Essay and presentation: 30%
 - : One essay per person
- Attendance and other CA: 10%
- Final exam: 60% (open book)
 - : Answering 3 essay-type questions

1.1. Logistics

■ Resources

- IVLE EC4372
- RBR

1.1. Logistics

■ Contact me

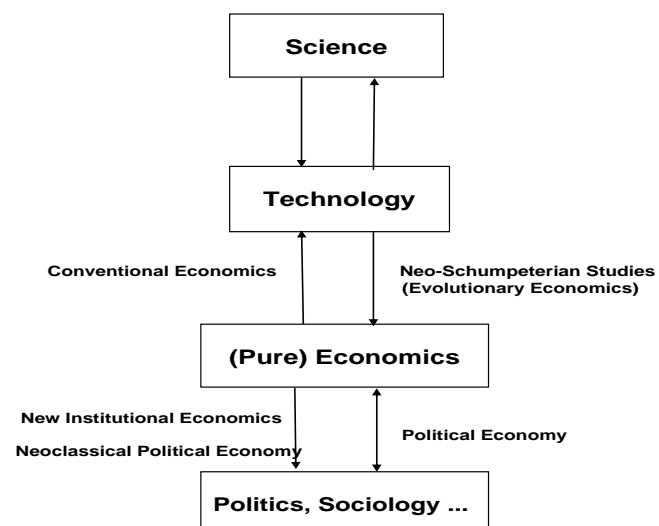
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1.1. Logistics

■ Consultation time

- Ring or e-mail me for appointment

1.2. The Scope of Technology and Innovation



1.2. The Scope of Technology and Innovation

- Technology as an entry point of economic analysis
 - “ ... a number of important economic problems can be powerfully illuminated [by examining technologies] ... because the specific characteristics of certain technologies have ramifications for economic phenomena that cannot be understood without a close examination of these characteristics”
(Rosenberg 1982: preface)
 - e.g. Industrial Revolution, Internet economy, Knowledge Based-Economy ...

1.2. The Scope of Technology and Innovation

- Schumpeter's characterisation of innovation: 'New Combinations'
 1. new (consumer) goods (or new quality of goods): product innovation
 2. new method of production: process innovation
 3. the opening of new market
 4. new source of supply of raw materials or half-manufactured goods
 5. new organisation of industry (including creation of monopoly position or breaking the monopoly)

1.2. The Scope of Technology and Innovation

- Focus of lectures and tutorials
 - Looking into technological imperatives and changes
 - Relating them to firm strategies and organization, and to national strategies and innovation systems
 - macroeconomics or microeconomics?
 - Focusing on the semiconductor industry

1.2. The Scope of Technology and Innovation

- Approach towards this module
 - Consider yourself as a president of a high-tech company, the Minister of the MTI, or Chairperson of A*STAR
 - Ask yourselves practical questions about what you need to know and what kind of decisions you have to make
 - Common sense answers to common sense questions

LECTURE OUTLINE

1. Overview

2. Methodology of Technology and Innovation

- 2.1. What is technology economics?
- 2.2. Growth Accounting and Measuring Technologies
- 2.3. The Schumpeterian dynamics
- 2.4. Theorisation and understanding reality

LECTURE OUTLINE

3. Basic Concepts of Technology and Innovation

- 3.1. Institutionalisation of R&D
- 3.2. Uncertainties and clustering of innovations
- 3.3. Technology creation and diffusion
- 3.4. Learning
- 3.5. Institutional dependence

LECTURE OUTLINE

4. Taxonomy of Innovations and Techno-Economic Paradigm Shift

- 4.1. Taxonomy of innovations
- 4.2. Techno-economic paradigm shift and business cycle
- 4.3. The ME Revolution and the Advent of the Knowledge-Based Economy

LECTURE OUTLINE

5. Technological Strategy of Firms and Nations

- 5.1. R&D investment and strategy
- 5.2. National innovation system and technology policy

LECTURE OUTLINE

6. Analyses of Firm and National Strategies for Development of High-Tech Industries

- 6.1. A comparative schema for understanding strategies and institutions
- 6.2. The USA system and Development of the SC industry
- 6.3. The Japanese model and its challenges
- 6.4. The Korean innovation system
- 6.5. The Singaporean innovation system
- 6.6. The Taiwanese innovation system
- 6.7. The USA resurgence in the 1990s

LECTURE OUTLINE

7. Global Dimensions in Technology and Innovation

- 7.1. Challenges of globalisation
- 7.2. GPN, global R&D Networks and firm strategies
- 7.3. GPN, global R&D Networks and National Innovation Systems

LECTURE OUTLINE

8. Singapore's Innovation System and Its Strategy in the 21st Century

8.1. Technological "Spill-Overs" from MNCs?

8.2. The future of Singapore's technology policy