PPOL 5530 Innovation Policy for Critical Technologies amidst Great Power Competition, Fall 2025/26

2 September 2025

Course Description

As nations increasingly view technological leadership as central to economic prosperity, national security, and global influence, innovation ecosystems have become arenas of intense international competition and strategic maneuvering. This course explores the intersection of innovation policy, critical emerging technologies, and contemporary geopolitical dynamics.

Instructors

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Prof. Julien de TROULLIOUD de LANVERSIN, Assistant Professor, PPOL (E-mail: jdtdl@ust.hk)

Prof. Alicia GARCIA HERRERO, Adjunct Professor, PPOL (E-mail: alicia@ust.hk)

Prof. Naubahar SHARIF, Adjunct Professor, PPOL (E-mail: sosn@ust.hk)

Teaching Assistant

Elizaveta DORRER, PPOL (E-mail: edorrer@connect.ust.hk)

Date & Time, Venue

Tuesdays, 18:30-21:20

Room 4504 (Lift 25/26)

Background

The landscape of public policy is increasingly shaped by technological advancements and the geopolitical context in which they occur. Traditional approaches to innovation policy, often focused purely on domestic market failures or linear models of R&D, are insufficient in an era defined by:

Strategic Competition: Explicit national strategies link technological dominance with geopolitical power (e.g., US CHIPS Act, China's Made in China 2025).

Supply Chain Security: The COVID-19 pandemic and geopolitical tensions have exposed vulnerabilities in global supply chains for critical technologies, prompting calls for resilience, diversification, and "friend-shoring."

Techno-Nationalism: Nations are implementing more assertive policies, including export controls, investment screening, and data localization measures, to protect perceived national interests and build national pride.

Contested Standards and Norms: Competition extends to setting global standards for emerging technologies (like AI and 6G) and influencing international norms around data governance and digital trade.

Dual-Use Technologies: The blurring lines between civilian and military applications of technologies like AI and quantum computing create complex policy dilemmas.

Public policy graduates entering government, international organizations, think tanks, or the private sector need a sophisticated understanding of how to design, analyze, and implement innovation policies that are effective domestically and account for these pressing geopolitical realities. This course fills a critical gap by explicitly integrating these two domains, equipping students with the necessary theoretical knowledge and analytical tools to navigate this complex policy space. It directly supports the program's goal of preparing students for leadership roles in addressing contemporary public challenges.

Course Objectives

This course explores the intersection of innovation policy, critical emerging technologies, and contemporary geopolitical dynamics. As nations increasingly view technological leadership as central to economic prosperity, national security, and global influence, innovation ecosystems have become arenas of intense international competition and strategic maneuvering. This course explores how governments design and implement policies to foster domestic innovation (R&D funding, talent development, IP protection, infrastructure) while navigating the complex challenges posed by great power rivalries, supply chain vulnerabilities, diverging technological standards, and the weaponization of technology. We will analyze the strategies of key global actors (e.g., US, China, EU, Japan, emerging economies), examine critical technology sectors (e.g., semiconductors, AI, quantum computing) and their technical foundations, and debate the trade-offs policymakers face between openness and security, collaboration and competition, and national interest versus global norms. Students will develop analytical frameworks to assess innovation policies in a contested global landscape and hone their ability to formulate effective policy recommendations.

Course Schedule

September 2, 2025 – Class 1: Introduction to Innovation Policy and the New Geopolitical Context (Naubahar SHARIF)

September 9, 2025 – Class 2: Theoretical Foundations of Innovation Systems and Policy (Naubahar SHARIF)

September 16, 2025 – Class 3: China’s Innovation System, National Strategies, and Global Impact (Naubahar SHARIF)

September 23, 2025 – Class 4: Technology primer – Semiconductors (Julien de TROULLIOUD de LANVERSIN)

September 30, 2025 – Class 5: Policy Measures: R&D Funding, Public Procurement, Intellectual Property, Standards, Talents (Masaru YARIME)

October 7, 2025: Holiday

October 14, 2025 – Class 6: Critical Technology Assessment: Supply Chain Resilience, Critical Minerals, Technology Alliance (Masaru YARIME)

October 21, 2025 – Class 7: Technology primer – Artificial Intelligence (Julien de TROULLIOUD de LANVERSIN)

October 28, 2025 – Class 8: Technology primer – Quantum Computing (Julien de TROULLIOUD de LANVERSIN)

November 4, 2025 – Class 9: Innovation in Critical Technologies (Alicia GARCIA HERRERO)

November 11, 2025 – Class 10: International Institutions: S&T Agreements, Digital Sovereignty, Trade and Industrial Policy (Masaru YARIME)

November 18, 2025 – Class 11: Impact of Export Controls (Alicia GARCIA HERRERO)

November 25, 2025 – Class 12: Economic Security Strategies (Alicia GARCIA HERRERO)

December 2, 2025 – Class 13: Final Paper Presentations & Course Wrap-up (Masaru YARIME)

Course Learning Outcomes (CLOs)

On successful completion of the proposed course, students will be able to:

1. Analyze the primary theoretical frameworks linking innovation, economic growth, national security, and international relations.
2. Identify and evaluate the diverse range of policy tools governments use to promote innovation and manage its geopolitical implications.
3. Compare and contrast the national innovation strategies and policy approaches of major global actors in key technology sectors.
4. Assess the impact of geopolitical competition, supply chain dynamics, and techno-nationalism on innovation ecosystems and policy choices.
5. Analyze the challenges and opportunities for international cooperation on science and technology amidst geopolitical tensions.
6. Critically evaluate the ethical and societal implications of innovation policies pursued in a competitive environment.
7. Develop and articulate evidence-based policy recommendations addressing challenges at the intersection of innovation and geopolitics.
8. Understand the basics of the scientific and technological principles that underpin critical technologies.

Assessment

- Attendance: 10%
- Participation in Class Discussions: Active engagement in class discussions (15%)
- Mid-term Exam: An examination of the knowledge about technical aspects of the innovations discussed in the classes (25%)
- Group Presentation: Each group of four students examines a particular challenge concerning the development or deployment of a critical technology and discusses policy measures to deal with the challenge (25%)
- Group Research Paper: A research paper of approximately 3,000-5,000 words based on the group work (25%)

Readings

Readings will be drawn from a mix of sources, including:

- Academic journals (e.g., Research Policy, Science and Public Policy, International Security, Foreign Affairs, Review of Policy Research)
- Books and book chapters on innovation policy, economic statecraft, and technology competition
- Policy reports from government agencies, international organizations (OECD, WTO, WIPO), and major think tanks (e.g., CSIS, RAND, Bruegel, MERICS)
- High-quality journalism and analysis (e.g., Financial Times, The Economist, Wall Street Journal)
- Case studies of specific technologies or policy interventions

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