



**TECHNOLOGY GOVERNANCE SUMMER SCHOOL**

12-22 August 2024

**Location:** Balsillie School of International Affairs, room 142

**Course Directors:** Professors Jatin Nathwani and Ann Fitz-Gerald

**Course description:**

This course provides graduate students with an in-depth understanding of the technology-policy nexus – an interface which has become a critical requirement for effective policy analysis and implementation.

Registered students from various faculties will learn about the relevant domains and discourse supporting technology innovation, as well as the issues, datasets, and trends underpinning this emerging and increasingly policy relevant area.

**Learning outcome:**

Students will gain knowledge of the key concepts underlying data science, data sets, data analytics, artificial intelligence, algorithms, large language models, the ‘Internet of Things’, sensors and devices, and the use and application of these approaches in key policy areas.

**Formative assessment:**

The course will feature presentations from leading technology science and policy experts and practitioners. Upon completion of the course and following the submission of a short “reflective course journal”, participants will be awarded with a certificate.

**Course sessions:**

**Week 1 – Technology, its applications and its impacts on society**

Day 01 (Monday, August 12)		
Time	Topic	Instructor(s)
9-10:30am	<b>Introduction to Week 1 / Introduction to Technology Governance</b>	Ann Fitz-Gerald
10:30-10:45am	<b>Break</b>	-
10:45am-12:30pm	<b>Intro to Data Science and Data Engineering</b>	M Tamer Özsu
12:30-1pm	<b>Lunch</b>	-
1-2:30pm	<b>Big Data</b>	M Tamer Özsu
2:30-2:45pm	<b>Break</b>	-
2:45-4pm	<b>Introduction to Quantum Computing</b>	Michele Mosca



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<b>Day 02 (Tuesday, August 13)</b>		
<b>Time</b>	<b>Topic</b>	<b>Instructor(s)</b>
9-10:30am	<b>Introduction to AI</b>	Mark Humphries
10:30-10:45am	<b>Break</b>	-
10:45am-12:30pm	<b>AI Challenges and opportunities: a STEM perspective</b>	Dmytro Chumachenko
12:30-1pm	<b>Lunch</b>	-
1-2:45pm	<b>AI and Social Impacts/Policy</b>	Raymond Ng
2:45-3pm	<b>Break</b>	-
3-4pm	<b>Plenary Discussion: Challenges of AI</b>	Ann Fitz-Gerald and Jatin Nathwani ( <i>moderators</i> )

<b>Day 03 (Wednesday, August 14)</b>		
<b>Time</b>	<b>Topic</b>	<b>Instructor(s)</b>
9-10:30am	<b>Ethics on AI</b>	Maura Grossman
10:30-10:45am	<b>Break</b>	-
10:45am-12:30pm	<b>Algorithms and Algorithms Optimization</b>	Azam Asilian Bidgoli
12:30-1pm	<b>Lunch</b>	-
1-2:30pm	<b>Nanotechnology</b>	Denis Wong
2:30-2:45pm	<b>Break</b>	-
2:45-4pm	<b>Large Language Models</b>	Pascal Poupart

<b>Day 04 (Thursday, August 15)</b>		
<b>Time</b>	<b>Topic</b>	<b>Instructor(s)</b>
9-10:30am	<b>Sensors, Microprocessor Chips and Devices - The ICT Ecosystem</b>	Hamid Arabzadeh
10:30-10:45am	<b>Break</b>	-
10:45am-12:30pm	<b>Data Security and Privacy</b>	Xi He
12:30-1pm	<b>Lunch</b>	-
1-2:30pm	<b>Evaluation and reporting of intangibles</b>	Bruce McConomy and Sarin John
2:30-2:40pm	<b>Break</b>	-
2:40-4pm	<b>Case Study</b>	Bruce McConomy and Sarin John ( <i>moderators</i> )



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## Week 2 – Policy development in a digital and data-driven world

<b>Day 05 (Monday, August 19)</b>		
<b>Time</b>	<b>Topic</b>	<b>Instructor(s)</b>
9-9:10am	<b>Introduction to Week 2</b>	Ann Fitz-Gerald and Jatin Nathwani
9:10-10:30am	<b>The Internet of Things (IoT)</b>	Natasha Tusikov and Blayne Haggart
10:30-10:45am	<b>Break</b>	-
10:45-12:30pm	<b>Exercise</b>	Natasha Tusikov and Blayne Haggart ( <i>moderators</i> )
12:30-1pm	<b>Lunch</b>	-
1-2:30pm	<b>Adding 'Value' to a Global 'Value Chain': The Importance of Intellectual Property on Emerging Technologies</b>	Jim Hinton
2:30-2:45pm	<b>Break</b>	-
2:45-4pm	<b>Case Study on Intellectual Property</b>	Jim Hinton ( <i>moderator</i> )

<b>Day 06 (Tuesday, August 20)</b>		
<b>Time</b>	<b>Topic</b>	<b>Instructor(s)</b>
9-10:30am	<b>Energy Security - Emerging Energy and Power Technologies and Policy Implications</b>	Jatin Nathwani
10:30-10:45am	<b>Break</b>	-
10:45-12pm	<b>Environmental Policy and Emerging Transformative Technology</b>	Neil Craik
12:30-1pm	<b>Lunch</b>	-
1-2:30pm	<b>Novel Water Systems: Policy Implications</b>	Dustin Garrick
2:30-2:45pm	<b>Break</b>	-
2:45-4pm	<b>Case Study on the Economics of Sustainability Applications</b>	Dustin Garrick ( <i>moderator</i> )

<b>Day 07 (Wednesday, August 21)</b>		
<b>Time</b>	<b>Topic</b>	<b>Instructor(s)</b>
9-10:30am	<b>National Security and Technology: Autonomous Weapons Systems</b>	Branka Marijan
10:30-10:45am	<b>Break</b>	-
10:45-12pm	<b>National Security and Technology</b>	Alexander Lanoszka
12:30-1pm	<b>Lunch</b>	-
1-2:30pm	<b>Strategic Planning for National Security Governance in a Data-Driven and Digital Age</b>	Ann Fitz-Gerald
2:30-2:45pm	<b>Break</b>	-
2:45-4pm	<b>Case Study on National Security Technology</b>	Ann Fitz-Gerald ( <i>moderator</i> )



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<b>Day 08 (Thursday, August 22)</b>		
<b>Time</b>	<b>Topic</b>	<b>Instructor(s)</b>
9-10am	<b>Emerging Technologies and Their Impact on Global Health Policy</b>	Stephanie DeWitte-Orr
10-10:15am	<b>Break</b>	-
10:15-12:30pm	<b>Case Study - Smart Phone Apps, Preventative Screening, and the Issue Of 'Consent</b>	Karen Yeates ( <i>moderator</i> )
12:30-1pm	<b>Lunch</b>	-
1-3pm	<b>Final Panel Discussion and Plenary Session - "The Impact of Technology on Geopolitics"</b>	Paul Samson, Bob Fay and Dan Monafu
3-3:15pm	<b>Break</b>	-
3:15-4pm	<b>Summary and Closing Remarks</b>	Ann Fitz-Gerald and Jatin Nathwani