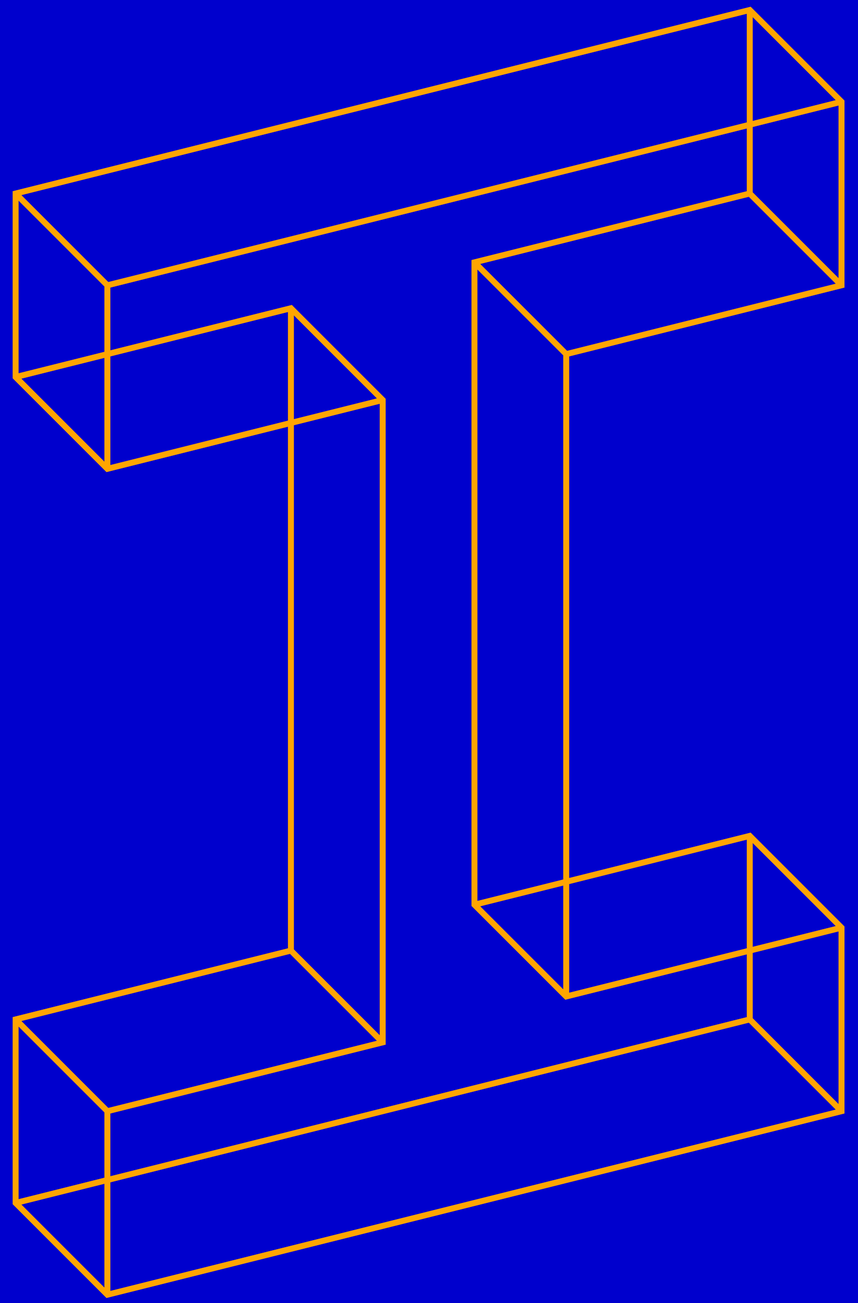
IMPERIAL POLICY FORUM

AI Fundamentals 2025



Imperial College London

About the course

The **AI Fundamentals** programme is designed for civil servants of any grade involved in AI regulation, strategy, or systems. With the rapid proliferation of AI tools and systems, governments face significant public policy challenges and opportunities.

Civil servants must navigate uncertainties around regulating AI's societal use while harnessing its transformative potential to improve the design and delivery of public services. Central government departments occupy a pivotal role, both as regulators of AI adoption and as major users and developers of AI technologies across their operations and public services.

The course will empower participants to act as informed 'expert customers' in the development and deployment of AI systems. As the UK Government rolls out its AI Opportunities Action Plan and its vision for modern digital government, this course is both timely and tailored for Civil Servants.

With no prior AI or computer science training required, participants will gain access to Imperial College London's globally renowned expertise in AI research and education. Combining interdisciplinary teaching, hands-on experience, and real-world case studies, the course delivers actionable knowledge to support the safe and impactful deployment of AI in public services.

Benefits

1. World-Class Expertise
Learn from Imperial College London's globally renowned faculty, leaders in AI research and application across engineering, medicine, and science.

2. Tailored for Public Sector
Gain practical insights through a curriculum co-designed with civil servants to address the unique challenges of public sector AI deployment.

3. Interdisciplinary Learning
Understand AI's integration with policy, ethics, and governance through real-world case studies and applications.

4. Strategic Knowledge
Master fundamental AI concepts, resource requirements, and programme design for implementing AI in different contexts.

5. Risk and Benefit Assessment
Develop the ability to evaluate the risks and benefits of various AI technologies in public services.

6. Hands-On Experience
Gain practical skills with AI systems, including working with advanced tools like Large Language Models.

Course outline

The programme will consist of eight training sessions targeted specifically at policymakers. The time commitment requested from participants is one half-day per week over the course of an eight-week period. All sessions will be held in person at Imperial's South Kensington campus.

Week 1:
Fundamental concepts

Artificial intelligence and machine learning, different types of learning/models/machine learning tasks, training a simple AI model, neural networks, explainability.

Week 2:
Natural Language Processing & Foundation Models

NLP, the foundation model paradigm, pretraining, finetuning, RLHF, prompt engineering, emergent behaviour, bias, hallucinations; alignment.

Week 3:
More advanced topics in LLMs

RAG, sentence embeddings, agentic systems, reasoning models.

Week 4:
Data quality, model validation and legitimacy

Overfitting and underfitting, fundamental trade-offs when deploying AI models, best practices for model training.

Week 5:
AI security and AI risks

Security risks to and from AI systems, AI models as components of larger systems, security implications.

Week 6:
AI regulation and AI safety

Frameworks for assessing and mitigating risks, balancing regulation and innovation.

Week 7:
Project work

Week 8:
Future of AI development

Project presentation, panel discussion with experts from industry, academia, and government.

Who should apply?

This course is for civil servants of any grade involved in AI regulation, strategy, or systems. No prior AI or computer science training required.

Application process

Applications for the Autumn cohort will open on Monday 28 July. When live, please complete the application form on the **AI Fundamentals** page and return to **the.forum@imperial.ac.uk** by Friday 29 August.

Successful applicants will be contacted by the Policy Forum team. The fee for the course is £500. Please ensure that you have approval from your relevant budget holder prior to application. The course will run every Friday from 10th October to Friday 28th November 2025.

Download Application Form

Programme leads

Professor Tom Coates, Programme Lead
Prof. Tom Coates is a Professor of Mathematics at Imperial College London. His research group works in algebraic geometry and large-scale computational algebra, building a Periodic Table for shapes, by combining new methods in geometry with cluster-scale computation, data mining, and machine learning. Prof. Coates has been on part-time secondment to the Office of the Chief Scientific Adviser since 2022.

Dr Sara Veneziale, Instructor
Dr Sara Veneziale is a Chapman-Schmidt fellow at the I-X Centre for AI in Science and the Department of Mathematics at Imperial College London. Her research focusses on using AI to discover and prove new results in mathematics, and on the high-dimensional geometry that underpins Large Language Models.

About Imperial Policy Forum

Imperial Policy Forum uses the latest evidence from Imperial's academics to inform the policy conversations that really matter. Our work draws on the skills, expertise and resources of different parts of the College and its wider networks. We harness the College's excellence in fundamental and applied research from across the Faculties of Natural Science, Engineering, Medicine and the Business School, and draw on the substantial expertise in some of its world-class Institutes and Centres.

We recognise that it is only by bringing together academia, government and industry we can find solutions to the biggest challenges facing the world today across climate, future technologies and health. We support researchers to better engage with policymakers and crossing the divide between academia and policy. We support policymakers through bespoke briefings, workshops and events to understand the latest evidence in key areas, supporting evidence-based decision-making.