41092 - Economics, population dynamics, and policy of climate change (24h)

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This course examines the climate change challenge through the integrated lenses of economics, population dynamics and public policy. It explores how climate change affects human systems and, in turn, how demographic and socioeconomic processes shape climate vulnerability, adaptation and mitigation pathways. The course analyses the heterogeneous impacts of climate change on populations, as well as social and economic systems, and investigates how demographic and social processes shape vulnerability and adaptation, and how these dynamics translate into political preferences and policy responses.

Particular attention is given to differential climate impacts across population subgroups, spatial contexts and institutional settings. The course also examines the role of private and public adaptation in shaping climate outcomes, as well as spatial adjustments through migration and trade. As human societies are currently facing multiple risks beyond climate change, the course also addresses compounding risks — for example, how climate interacts with conflict exposure in shaping demographic and socioeconomic trajectories.

Methodologically, the course is grounded in state-of-the-art empirical research, with a strong focus on causal inference, advanced econometric methods, demographic modeling and interdisciplinary approaches. Students will engage with frontier research that informs policy-relevant analysis and evidence-based climate policy.

- Climate change and human systems
  - (Raya 1) Reciprocal relationship between population and the climate system; Demographic drivers of emissions and environmental change
- Measuring climate impacts
  - (GZ 1-2): Empirical approaches to climate change impact quantification, the damage function, and the social cost of carbon
  - (Raya 2-3) – Effects of climate shocks on fertility, mortality, health, and migration; Long-term demographic consequences of environmental change
- Adaptation to climate change
  - (GZ 3-4): Definitions and measurement of adaptation across space and time; frictions and constraints to adaptation; role of public sector
- Differential vulnerability, adaptation and resilience
  - (Raya 4) Demographic heterogeneity underlying vulnerability and adaptation (age, gender and education)
- Political economy, public support, and climate policy design

- (Raya 5) Legal and governance challenges in protecting climate-related migrants, and the role of statistical analysis in informing evidence-based policy.
- (GZ 5): Climate policy options; beliefs about environmental problems and climate change; public support for environmental and climate policies

Assessment

1) **Critical reading and presentation** of a pre-print or working paper related to climate change.
2) **Term paper (research proposal)** including:
   - Review of the state of the art
   - Identification of research gaps
   - Clear research question(s)
   - Research design
   - Data and methodological approach